PUBLIC REVIEW DRAFT

MARKETPLACE REDEVELOPMENT PROJECT ENVIRONMENTAL IMPACT REPORT

APPENDIX B

TRANSPORTATION, CIRCULATION, AND PARKING STUDY

EMERYVILLE, CALIFORNIA

STATE CLEARINGHOUSE #2005122006

LSA

June 2007

PUBLIC REVIEW DRAFT

MARKETPLACE REDEVELOPMENT PROJECT ENVIRONMENTAL IMPACT REPORT

APPENDIX B

TRANSPORTATION, CIRCULATION, AND PARKING STUDY

EMERYVILLE, CALIFORNIA

STATE CLEARINGHOUSE #2005122006

Submitted to:

Miroo Desai, Senior Planner
City of Emeryville
1333 Park Avenue
Emeryville, CA 94608-3517

Prepared by:

LSA Associates, Inc.
2215 Fifth Street
Berkeley, CA 94710
510.540.7331

LSA Project No. CEM531

LSA

June 2007

TECHNICAL APPENDICES

APPENDIX B: Transportation, Circulation, and Parking Study

APPENDIX B-1: *Proposed Project* Transportation, Circulation, and Parking Study and LOS Traffic Modeling Outputs

APPENDIX B-2: *Alternatives* LOS Traffic Modeling Outputs

APPENDIX B-3: *Alternatives* Queue Modeling Outputs

APPENDIX B

TRANSPORTATION, CIRCULATION, AND PARKING STUDY

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Transportation Impact Report

Emeryville Marketplace

June 2007

Prepared for:
LSA Associates, Inc.
and City of Emeryville, CA

TABLE OF CONTENTS

Executive Summary ..... **i**
Project Description I
Study Intersections and Forecast Scenarios I
Findings and Recommendations II
1. Introduction **1**
Study Purpose 1
Study Intersections and Forecast Scenarios 1
Level of Service Methods 5
Regulatory Setting 7
Report Organization 8
2. Existing Setting **9**
Existing Roadway Network 9
Existing Traffic Volumes 12
Existing Transit Service 12
Existing Bicycle and Pedestrian Facilities 17
Existing Intersection Operating Conditions 18
3. Project Characteristics **22**
Project Description 22
Project Trip Generation 22
Project Trip Distribution and Assignment 23
4. Future 2010 And 2030 Conditions **29**
Traffic Forecasts 29
Future Roadway Improvements 29
Future 2010 Intersection Operating Conditions 30
Future 2030 Intersection Operating Conditions 30
5. Off-Site Impacts and Mitigation Measures **46**
Project Impacts 46
Mitigation Measures 47
6. Alameda County Congestion Management Agency (ACCMA) Mts Roadway Analysis **72**
NOP Comments 72
ACCMA Roadway Analysis Study Area 72
Traffic Forecasts 73
Analysis Method 73
Significance Criteria 73
Analysis Results 73
7. Alternative Modes Analysis **78**
Transit Access and Circulation 78
Pedestrian Access and Circulation 80
Bicycle Access and Circulation 81
Transit, Pedestrian and Bicycle Recommendations 82
8. Vehicular Site Access, On-Site Circulation and Parking **85**
Site Access 85
On-Site Circulation 89
Parking Supply and Demand 93
Summary of Vehicular Site Access, On-Site Circulation and Parking Recommendations 96

9. Alternatives Analysis 99
Description of Alternatives 99
Trip Generation Comparisons 100
Level of Service Summary 100
Project Alternatives Mitigation Measures 108

APPENDICES

Appendix A: Traffic Counts
Appendix B: Level of Service Calculations
Appendix C: Queuing Calculations
Appendix D: Approved Project Listing
Appendix E: Watry Design, Inc. Parking Study
Appendix F: Project Alternatives Information

LIST OF FIGURES

Figure 1a Project Site Vicinity and Study Intersections 2
Figure 1b Project Site Vicinity and Study Intersections 3
Figure 2 Conceptual Project Site Plan 4
Figure 3a Existing Lane Configuration and Traffic Control 10
Figure 3b Existing Lane Configuration and Traffic Control 11
Figure 4a Existing Weekday Peak Hour Traffic Volumes 13
Figure 4b Existing Weekday Peak Hour Traffic Volumes 14
Figure 5 Existing Saturday Peak Hour Traffic Volumes 15
Figure 6a Peak Hour Project Trip Assignment 25
Figure 6b Peak Hour Project Trip Assignment 26
Figure 6c Peak Hour Project Trip Assignment 27
Figure 6d Peak Hour Project Trip Assignment 28
Figure 7a Future 2010 Weekday Peak Hour Without Project Traffic Volumes 32
Figure 7b Future 2010 Weekday Peak Hour Without Project Traffic Volumes 33
Figure 8 Future 2010 Saturday Peak Hour Without Project Traffic Volumes 34
Figure 9a Future 2030 Weekday Peak Hour Without Project Traffic Volumes 35
Figure 9b Future 2030 Weekday Peak Hour Without Project Traffic Volumes 36
Figure 10 Future 2030 Saturday Peak Hour Without Project Traffic Volumes 37
Figure 11a Future Lane Configurations and Traffic Control 38
Figure 11b Future Lane Configurations and Traffic Control 39
Figure 12a Existing Plus Project Weekday Peak Hour Traffic Volumes 53
Figure 12b Existing Plus Project Weekday Peak Hour Traffic Volumes 54
Figure 13 Existing Plus Project Saturday Peak Hour Traffic Volumes 55
Figure 14a Future 2010 With Project Weekday Peak Hour Traffic Volumes 56
Figure 14b Future 2010 With Project Weekday Peak Hour Traffic Volumes 57
Figure 15 Future 2010 With Project Saturday Peak Hour Traffic Volumes 58
Figure 16a Future 2030 With Project Weekday Peak Hour Traffic Volumes 59
Figure 16b Future 2030 With Project Weekday Peak Hour Traffic Volumes 60
Figure 17 Future 2030 With Project Saturday Peak Hour Traffic Volumes 61
Figure 18 Recommended Routing, Layover and Stop Location for AC Transit Route 57 83
Figure 19 Recommended Pedestrian Paths 84
Figure 20 Surface Parking Lot Circulation Recommendations 90

Figure 21 Weekend Shared Parking Demand Analysis 97
Figure 22 Weekday Shared Parking Demand Analysis 98
Figure 23 Conceptual Project Site Plan – Reduced Project Alternative 101
Figure 24 Conceptual Project Site Plan – Tower Alternative 102
Figure 25 Conceptual Project Site Plan – Main Street Alternative 103

LIST OF TABLES

Table 1 Unsignalized Intersection Level of Service Definitions Using Average Control Delay 6
Table 2 Signalized Intersection Level of Service Definitions Using Average Control Delay 7
Table 3 Existing Peak Hour Intersection Operating Conditions 18
Table 4 Existing Vehicle Queues 21
Table 5 Project Trip Generation Rates 23
Table 6 Project Trip Generation 24
Table 7 Project Trip Distribution 24
Table 8 Future 2010 Peak Hour Intersection Operating Conditions 40
Table 9 Future 2010 Vehicle Queues 42
Table 10 Future 2030 Peak Hour Intersection Operating Conditions 43
Table 11 Future 2030 Vehicle Queues 45
Table 12 Existing Plus Project Peak Hour Intersection Operating Conditions 62
Table 13 Existing Plus Project Vehicle Queues 64
Table 14 Future 2010 Peak Hour Intersection Operating Conditions 65
Table 15 Future 2010 Plus Project Vehicle Queues 67
Table 16 Future 2030 Peak Hour Intersection Operating Conditions 68
Table 17 Future 2030 Plus Project Vehicle Queues 70
Table 18 Project Contribution to Impacted Intersections 71
Table 19 MTS Roadway System Analysis Summary - 2010 AM 74
Table 20 MTS Roadway System Analysis Summary - 2010 PM 75
Table 21 MTS Roadway System Analysis Summary - 2025 AM 76
Table 22 MTS Roadway System Analysis Summary - 2025 PM 77
Table 23 Peak-Hour Transit Trip Generation 78
Table 24 Future Peak Hour Driveway Operating Conditions 86
Table 25 Future 2010 Peak Hour Driveway Vehicle Queues 87
Table 26 Future 2030 Peak Hour Driveway Vehicle Queues 88
Table 27 City Code Automobile Parking Requirements 94
Table 28 Project Alternative Trip Generation Comparison 100
Table 29 Existing Conditions Peak Hour Intersection Operating Conditions With Project Alternatives 104
Table 30 Future 2010 Peak Hour Intersection Operating Conditions With Project Alternatives 105
Table 31 Future 2030 Peak Hour Intersection Operating Conditions With Project Alternatives 106
Table 32 Project Alternatives Impact Comparison Summary 108

EXECUTIVE SUMMARY

This study evaluates the transportation impacts of the Marketplace Redevelopment Project (Project), a mixed use development in the City of Emeryville.

PROJECT DESCRIPTION

The Project is a proposed mixed-use development containing residences, offices, a movie theater, retail shops and restaurants. The redevelopment plan would increase the retail/restaurant square footage by up to 77,000 square feet and provide up to 340 residential units in addition to structured parking and reconfiguration of the surface parking area. The project would be phased to ensure adequate parking supplies are provided for existing site uses during construction. The Project site is generally bound by 64th Street to the north, the Southern Pacific Railroad to the east, Powell Street to the south and Christie Avenue to the west. Project site access would be provided by driveways on Shellmound Street, Christie Avenue, and 64th Street.

STUDY INTERSECTIONS AND FORECAST SCENARIOS

Project impacts to the roadway system were identified by evaluating the morning (7:00 – 9:00 AM) and evening (4:00 – 6:00 PM) peak period operations of selected intersections (listed below) under six scenarios. The Saturday peak period (2:00 – 4:00 PM) was evaluated at 15 study intersections (these locations are noted below with an asterisk). Operations at the driveways that serve the site were also evaluated for the AM, PM, and Saturday peak periods. The following 28 study intersections were selected in consultation with the City of Emeryville staff, as these are considered most likely to experience traffic impacts resulting from the project:

1. Ashby Avenue/7th Street
2. Ashby Avenue/San Pablo Avenue
3. 65th Street/Christie Avenue*
4. 65th Street/Shellmound Street*
5. 65th Street/Overland Avenue*
6. 65th Street/Hollis Street
7. 64th Street/Christie Avenue*
8. 64th Street/Shellmound Street*
9. Shellmound Way/Christie Avenue*
10. Shellmound Way/Shellmound Street*
11. I-80 Hook Ramps/Frontage Road*
12. Powell Street/Frontage Road*
13. Powell Street/I-80 Eastbound Ramps*
14. Powell Street/Christie Avenue *
15. Christie Avenue/Shellmound Street*
16. Powell Street/Hollis Street*
17. Stanford Avenue/San Pablo Avenue
18. 40th Street/Horton Street
19. 40th Street/Hollis Street
20. 40th Street/Harlan Street
21. 40th Street/Emery Street*
22. 40th Street/San Pablo Avenue*
23. 40th Street/Adeline Street
24. Mandela Pkwy/Horton Street
25. MacArthur Boulevard/Emery Street
26. Adeline Street/San Pablo Avenue
27. 36th Street/San Pablo Avenue
28. 35th Street/San Pablo Avenue

1. ***Existing Conditions*** – Existing peak hour conditions based on recent traffic volumes and existing roadway network.
2. ***Future Year 2010 Conditions*** – Existing peak hour traffic volumes plus estimated trips from approved and pending projects in the vicinity of the study area which are likely to be constructed by 2010.
3. ***Future Year 2030 Conditions*** – Existing peak hour traffic volumes plus estimated trips from approved and pending projects in the vicinity of the study area which are likely to be constructed by 2030.

4. ***Existing Plus Project Conditions*** – Existing peak hour conditions as described above plus trips generated by the proposed project.
5. ***Future Year 2010 plus Project Conditions*** – Future Year 2010 Conditions as described above plus trips generated by the proposed project.
6. ***Future Year 2030 plus Project Conditions*** – Future Year 2030 Conditions as described above plus trips generated by the proposed project.

FINDINGS AND RECOMMENDATIONS

Off-Site Findings

Off-site impacts were identified for the Existing, 2010 and 2030 Plus Project condition and are summarized below:

Existing Plus Project

Impact Statement 1a: The ***I-80 EB Ramps/Powell Street*** intersection currently operates at LOS E during the PM peak hour and Saturday peak hour. The addition of project traffic would worsen the service level to LOS F during the PM peak hour and increase delay by 10 seconds. On Saturday, the addition of project traffic would increase delay by 8 seconds. The addition of project traffic would also increase the 95th percentile queue lengths for several approaches that currently exceed or are projected to exceed the available storage capacity during the weekday PM and Saturday afternoon peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 1a: Modify the intersection to:

a. Reconstruct the off-ramp to provide dual left-turn and dual right-turn lanes. The additional lane should be 600 to 900 feet, depending on design parameters stipulated by Caltrans.

b. Reconstruct the southeast corner of the Powell Street/I-80 Eastbound Ramps intersection improving the curb radii to 40 feet.

c. Widen the north side of Powell Street 12 to 14 feet between Christie Avenue and Eastbound I-80 Ramps to align westbound Powell Street through lanes across the intersection with Eastbound I-80 Ramps. This improvement will also allow the widening of the eastbound right-turn lane at the Powell Street/Christie Avenue intersection to 14 feet and construction of a pedestrian median refuge on the west side of the Powell Street/Christie Avenue intersection. This change requires right-of-way along the north side of Powell Street between Christie Avenue and the I-80 Eastbound On-Ramp.

This recommendation should be implemented with Mitigation Measure 3 to provide corridor benefits.

This impact also occurs in the 2010 and 2030 scenarios and can be attributed to existing traffic in the area, as well as traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include this recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees. Additionally, it should be noted that right-of-way for this improvement is reliant on the redevelopment of the adjacent parcels and the improvements can be phased to provide interim benefit as right-of-way becomes available.

The Project impact would be reduced to a ***less-than-significant*** level. However, as the intersection is within the Caltrans right-of-way and the City cannot assure the implementation of this measure, the impact may remain ***significant and unavoidable***.

Impact Statement 1b: Many elements of the project would help minimize the number of vehicle trips that could result from the proposed project and minimize the project's adverse impact on intersection operations. The project proposes to construct a mixture of uses, within a mixed use environment. Class II bicycle lanes are provided adjacent to the project site, with bicycle parking proposed. A minimum of ten foot side walks and marked pedestrian crossings would be provided as part of the project. The site is well served by transit. Shared parking between residential guest parking and retail parking is proposed to minimize the total parking supply. Implementation of a formal Transportation Demand Management Plan (TDM) could further minimize the project's impacts on traffic and circulation. However, the requirement to implement a formal Transportation Demand Management Plan (TDM) could further minimize the project's impacts on traffic and circulation.

Mitigation Measure 1b: Implementation of the following mitigation measure would minimize the project's impacts on intersection operation; however as it is difficult to quantify the effects of TDM measures implementation of this measure alone would not reduce project impacts to a less-than-significant level.

The project applicant shall prepare and implement a comprehensive transportation demand management (TDM) program that includes the following elements to encourage and enhance alternate modes of travel:

- Transit amenities, including bus pull-outs, transit information and ticket kiosks, and discounted transit passes for employees and residents.
- Carpool/vanpool support, including preferential parking spaces and ride-matching programs.
- Carshare support, including free parking spaces, on-site information and advertising, and discounted rates/long-term contracts.
- Bicycle amenities, including bicycle parking racks, pilot bicycle rental program, new bicycle paths, and shower/locker facilities.

In addition, the TDM plan should discourage automobile use by incorporating the following elements:

- Residential parking spaces should be unbundled from the units.
- All non-residential parking should be paid parking.
- Monthly parking permits should not be provided for employees.

Provision of car sharing facilities on-site could help reduce auto ownership amongst future residents/tenants of the building and encourage alternative modes for trips generated by the site. The TDM program shall be submitted to City staff for review and acceptance prior to approval of any Final Development Plans.

Impact Statement 2: The ***Shellmound Street/65th Street*** intersection currently operates at LOS E during the PM peak hour. With the addition of project traffic, the intersection would degrade to LOS F, resulting in a ***significant*** impact. However, a traffic signal was recently installed at this intersection, resulting in LOS B operations during the PM and Saturday peak hours with the addition of the project traffic. Therefore, as a traffic signal has been installed at this location, the project impact is ***less-than-significant***.

Mitigation Measure 2: No improvements are recommended.

Impact Statement 3: The ***Powell Street/Christie Avenue*** intersection operates at an acceptable service level, both without and with the Project. However, vehicle queue spillback affects overall intersection and system operations. The addition of project traffic would exacerbate existing queuing problems during the weekday PM and Saturday afternoon peak hours, contributing to poor operations on some intersection approaches. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 3: Modify the intersection to:

a. Reconstruct the westbound approach to provide a second left turn lane. The resulting two left turn lanes should be 250 feet in length. The south side of the Powell Street bridge would need to be widened by about 12 feet to accommodate the second left turn lane.

b. Reconstruct the southbound approach to provide a southbound left-turn lane (in addition to the shared left-through lane). The lane would extend from Powell Street back to Shellmound Way. This change would require widening the west side of Christie Avenue by about 12 feet. This change requires right-of-way along the west side of Christie Avenue.

c. Re-time the Powell/Christie Loop signalized intersections to coordinate the critical movements through the intersection.

These recommendations should be implemented with Mitigation Measures 1a and 1b to provide corridor benefits.

These improvements would reduce the queuing impact to a ***less-than-significant*** level. Each of the changes requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

This impact also occurs in the 2010 and 2030 scenarios and can be attributed to existing traffic in the area, as well as traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include this recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees. Additionally, it should be noted that right-of-way for this improvement is reliant on the redevelopment of the adjacent parcels and the improvements can be phased to provide interim benefit as right-of-way becomes available.

<u>2010 Plus Project</u>

Impact Statement 4: The ***I-80 EB Ramps/Powell Street*** intersection is projected to operate at F during the PM peak hour and Saturday peak hour in 2010. The addition of project traffic would increase delay by more than 4 seconds during both the PM and Saturday peak hours. The addition of project traffic would also increase the 95th percentile queue lengths for several approaches that currently exceed or are projected to exceed the available storage capacity during the weekday PM and Saturday afternoon peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 4: Implement Mitigation Measures 1a and 1b. Implementation of these measures would reduce the impact to a ***less-than-significant*** level. However, as the intersection is within the Caltrans right-of-way and the City cannot assure the implementation of this measure, the impact may remain ***significant and unavoidable***. This recommendation should be implemented with Mitigation Measure 3 to provide corridor benefits.

Impact Statement 5: The ***Shellmound Way/Christie Avenue*** intersection is projected to operate at an acceptable service level both without and with the project in 2010. However, the addition of project traffic would result in the westbound left-turn movements exceeding the available storage length and spilling back to Shellmound Street during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 5:*** Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

Impact Statement 6: The ***Shellmound Way/Shellmound Street*** intersection is projected to operate at an acceptable service level both without and with the project in 2010. However, the addition of project traffic would result in the 95th percentile eastbound vehicle queues exceeding the available storage, resulting in vehicle queue spillback to Christie Avenue during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 6:*** Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

Impact Statement 7: The ***Powell Street/Christie Avenue*** intersection operates at an acceptable service level, both without and with the Project. However, vehicle queue spillback affects overall intersection and system operations. The addition of project traffic would exacerbate existing queuing problems, contributing to poor operations for the southbound through movement, the westbound right-turn movement and the eastbound right-turn movement during the weekday PM and Saturday afternoon peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 7:*** Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the project impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired. This recommendation should be implemented with Mitigation Measure 1a to provide corridor benefits.

2030 Plus Project

Impact Statement 8: The ***Shellmound Street/65th Street*** and the ***Overland Street/65th Street*** will operate as one intersection in 2030 and is projected to operate at a service level F with an overall average delay of 96 seconds during the PM peak hour. The addition of project trips during the weekday PM peak hour would increase overall intersection delay to 102 seconds, a six second increase. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact. Additionally, the intersection would experience deficient operations when a train crosses over 65th Street.

> ***Mitigation Measure 8***: Modify signal operations to provide protected/permitted left-turns on the southbound Shellmound Street approach. Implementation of this measure would improve the overall intersection operations to LOS E in the PM peak hour in 2030, reducing the impact to a ***less-than-significant*** level.

This impact can be attributed to existing traffic in the area, as well as traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include this recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees.

Impact Statement 9: The ***Ashby Avenue/San Pablo Avenue*** intersection is projected to operate at a service level F with an overall average delay of 128 seconds during the PM peak hour in 2030. The addition of project trips during the weekday PM peak hour would increase overall intersection delay to 135 seconds, a seven second increase. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 9: To reduce this impact to a less than significant level, the intersection would have to modified, when traffic conditions warrant, to provide dual northbound left-turn lanes similar to the northbound left-turn lane design on San Pablo Avenue at 40th Street. Construction of this improvement would require elimination of on-street parking along San Pablo Avenue approaching the intersection. Relocation of bus stops for buses operating along San Pablo Avenue would also be required.

The applicant shall pay a fee based on its fair share of the project's anticipated growth in traffic to the intersection toward the cost to implement this improvement. The payment shall be made to the City of Emeryville, for the benefit of the City of Berkeley, prior to issuance of the temporary certificate of occupancy for the last building. However, this intersection is located in the City of Berkeley and is also under the jurisdiction of Caltrans, since both Ashby Avenue and San Pablo Avenue are state highways at this intersection. Therefore, the final selection of the appropriate intersection design, as well as implementation of the modifications, are not within the jurisdiction of the City of Emeryville. Therefore, this impact would remain ***significant and unavoidable***.

Impact Statement 10: The ***I-80 EB Ramps/Powell Street*** intersection is projected to operate at F during the PM peak hour and Saturday peak hour in 2030. The addition of project traffic would increase delay by more than 4 seconds during both the PM and Saturday peak hours. The addition of project traffic would also increase the 95th percentile queue lengths for several approaches that currently exceed or are projected to exceed the available storage capacity during both the PM and Saturday peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 10: Implement Mitigation Measure 1a and 1b. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level. However, as the intersection is within the Caltrans right-of-way and the City cannot assure the implementation of this measure, the impact may remain ***significant and unavoidable***. This recommendation should be implemented with Mitigation Measure 3 to provide corridor benefits.

Impact Statement 11: The ***Powell Street/Hollis Street*** intersection is projected to operate at a service level F with an overall average delay of 114 seconds during the PM peak hour in 2030. The addition of project trips during the weekday PM peak hour would increase overall intersection delay to 120 seconds, a six second increase. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 11: Implement simultaneous left-turn signal phasing for the north/south left turn movements. This will require a five to six foot lane shift for northbound Hollis Street traffic approaching Powell Street and reconstruction of the southwest corner of the intersection to accommodate tractor-trailer trucks making a right-turn from Powell Street to Hollis Street. The lane shift will require right-of-way

along the west side of Hollis Street. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

This impact can be attributed to traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include the recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees. Additionally, it should be noted that right-of-way for this improvement is reliant on the redevelopment of the adjacent parcels. Should the needed right-of-way not be acquired, the impact would remain ***significant and unavoidable***.

Impact Statement 12: The ***Shellmound Way/Christie Avenue*** intersection is projected to operate at an acceptable service level both without and with the project in 2030. However, the addition of project traffic would result in the westbound left-turn movements exceeding the available storage length and spilling back to Shellmound Street during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 12: Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the project impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

Impact Statement 13: The ***Powell Street/Christie Avenue*** intersection operates at an acceptable service level, both without and with the Project. However, vehicle queue spillback affects overall intersection and system operations. The addition of project traffic would exacerbate existing queuing problems, contributing poor operations on some intersection approaches during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 13: Implement Mitigation Measures 1a and 3. Implementation of these measures would reduce the project impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired. This recommendation should be implemented with Mitigation Measure 1a to provide corridor benefits.

Impact Statement 14: The addition of project traffic would result in deficient LOS F operations at the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway intersection as well as at the Woodfin Hotel driveway with buildout of the project parcels on the west side of Shellmound Street. This is a potentially ***significant impact***.

Mitigation Measure 14: In conjunction with construction on the Shellmound site, a traffic signal shall be installed at the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway intersection. The driveways shall be modified to provide sufficient vehicle storage to minimize vehicle queue spill back from impeding on-site circulation. Implementation of this measure would result in acceptable service levels during the peak hours. However, the 95th percentile queue for the northbound movements would periodically spillback through the pedestrian crossing and from the pedestrian crossing through the Woodfin Driveway, and Shellmound Way. Minimizing the effect of queue spillback could be achieved through monitoring of the signal timings. It should be noted that the Shellmound Street corridor from Shellmound Way through the Marketplace Driveway would operate better in the mitigated scenario than

the unmitigated scenario even though vehicle queues would periodically spill back through the corridor, resulting in a ***significant and unavoidable*** queuing impact on the Shellmound Street corridor.

Impact Statement 15: The addition of project traffic would worsen side street operations at the Shellmound Street/Woodfin Hotel/Marketplace Driveway intersection to LOS F with buildout of the project. This is a potentially ***significant impact***.

Mitigation Measure 15: The driveway serving the Woodfin Hotel cannot accommodate significant additional traffic flows. It is recommended that the parking area serving the new land uses on the Shellmound site be designed to orient the majority of outbound traffic, about 80 percent, away from the shared driveway. Alternatively, this driveway could be restricted right-in/right-out operation. With right-in/right-out operation, the worst movement would operate at LOS C and the intersection would operate at an overall LOS A during both the weekday PM and Saturday afternoon peak hours. However, restricting access to this parcel could potentially create circuitous travel through the area, and would reduce access to/from the Woodfin Hotel. Therefore, access restrictions are not recommended, resulting in a ***significant and unavoidable*** impact.

Impact Statement 16: Vehicle queues at the pedestrian crossing are expected to increase as pedestrian activity increases around the project site. This queuing contributes to deficient operations at the Shellmound Street/Woodfin Hotel/Marketplace Driveway and the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway. This is a potentially ***significant impact***.

Mitigation Measure 16: Install a pedestrian signal at the pedestrian crossing on Shellmound Street. Through design treatments, such as sidewalk railings and landscaping, consolidate pedestrian activity from the Shellmound Street/Woodfin Hotel/Marketplace Driveway and the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway to the pedestrian crossing. The pedestrian signal shall be interconnected and coordinated with the signal at the Shellmound Street/Shellmound Way intersection and the Shellmound Street/Marketplace Driveway/ Shellmound Garage intersection. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level. It should be noted that the Shellmound Street corridor from Shellmound Way through the Marketplace Driveway would operate better in the mitigated scenario than the unmitigated scenario even though vehicle queues would periodically spill back through the corridor, resulting in a ***significant and unavoidable*** queuing impact on the Shellmound Street corridor. However, the installation of a pedestrian signal would improve pedestrian safety across Shellmound Street as traffic volumes increase through the corridor, reducing the pedestrian impact to a ***less-than-significant*** level.

Impact Statement 17: With signalization of the Shellmound Street/Shellmound Site Garage Driveway/ Marketplace Driveway intersection, the design of the garage entry would not provide sufficient vehicle storage. Additionally, as vehicles queue internally, access to parking areas could be blocked, creating the potential for vehicle queues onto Shellmound Street. This is a potentially ***significant impact***.

Mitigation Measure 17: Redesign the Shellmound building garage entrance area to minimize vehicle conflicts and provide sufficient vehicle storage at the access intersection. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

Alternative Mode Findings

Transit, pedestrian and bicycle access to and around the site was reviewed. The following are recommendations to improve alternative mode access to the site:

- The project applicant shall continue contributions to the Emery Go Round system, as currently performed under the Property based Business Improvement District (PBID). Contributions are based on building square footage. Therefore, as development occurs, contributions would increase.

- Reorient Route 57 through the study area in conjunction with providing a formal layover with bathroom facilities for AC Transit drivers. Provide a bus layover on the south side of 64th Street, with bathroom access provided to AC Transit drivers at the proposed retail portion of the 64th & Shellmound building. Provide a bus stop with a pullout on the east side of Shellmound Street, north of the pedestrian crossing, for northbound buses. Provide a southbound bus stop on the west side of Shellmound Street, south of the Shellmound Street/Marketplace driveway.

- Concentrate pedestrian crossing movements through design treatments to the mid-block crossing on Shellmound Street. Provide a pedestrian signal at the mid-block Shellmound Street crosswalk to consolidate pedestrian movements and maintain vehicle flows through the corridor. Construct sidewalks a minimum of 10 feet wide and provide appropriate landscaping along Shellmound Street to maintain pedestrian visibility and sight distance.

- Reorient the crosswalk across Shellmound Street at the Woodfin Hotel/Marketplace driveway intersection perpendicular to the travel way to reduce pedestrian exposure.

- The Shellmound Building elevators proposed to serve the Amtrak pedestrian bridge should be large enough to accommodate bicyclists.

- As the project is developed, the provision of additional bicycle parking spaces is recommended as demand warrants. Three distinct types of bicycle parking shall be provided: 1) secured bicycle lockers on the upper levels of the garage reserved for resident use only; 2) secured bicycle lockers on the lower levels of the garage for employee parking; and 3) bicycle parking on the ground floor reserved for retail patrons.

On-Site Findings

On-site circulation was reviewed in terms of driveway operations, delivery vehicle access, parking stall dimensions, parking garage design. Recommendations to improve site access and circulation are below.

- In conjunction with construction on the Shellmound site, a traffic signal shall be installed at the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway intersection. The driveways shall be modified to provide sufficient vehicle storage to minimize vehicle queue spill back from impeding on-site circulation. Implementation of this measure would result in acceptable service levels during the peak hours. However, the 95th percentile queue for the northbound movements would periodically spillback through the pedestrian crossing and from the pedestrian crossing through the Woodfin Driveway, and Shellmound Way. Minimizing the effect of queue spillback could be achieved through monitoring of the signal timings. It should be noted that the Shellmound Street corridor from Shellmound Way through the Marketplace Driveway would operate better in the mitigated scenario than the unmitigated scenario even though vehicle queues would periodically spill back through the corridor.

- The driveway serving the Woodfin Hotel cannot accommodate significant additional traffic flows. It is recommended that the parking area serving the new land uses on the Shellmound site be designed to orient the majority of traffic, about 80 percent, away from the shared driveway. Alternatively, this driveway could be restricted right-in/right-out operation.

- Install a pedestrian signal at the pedestrian crossing on Shellmound Street. Using design treatments, consolidate pedestrian activity from the Shellmound Street/Woodfin Hotel/Marketplace Driveway and the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway to the pedestrian crossing. The pedestrian signal shall be interconnected and coordinated with the signal at the Shellmound Street/Shellmound Way intersection and the Shellmound Street/Marketplace Driveway/Shellmound Garage intersection. It should be noted that the Shellmound Street corridor from Shellmound Way through the Marketplace Driveway would operate better in the mitigated scenario than the unmitigated scenario even though vehicle queues would periodically spill back through the corridor. Additionally, the installation of a pedestrian signal would improve pedestrian safety across Shellmound Street as traffic volumes increase through the corridor.

- Reconfigure the parking area adjacent to retail pad #2 to provide sufficient space for vehicles to back out of the last spaces in each row.

- Review delivery vehicle access prior to approval of the final site plan.

- Redesign assigned resident parking stalls to meet standard City dimensions, as some reserved resident stalls are designated compact.

- Review the ramping system of the 64th & Christie building garage during permit approval to ensure compliance with City of Emeryville design guidelines.

- Design the parking garages with roll up gates as an improperly parked or oversized vehicle could interfere with the function of a swinging or sliding gate.

- Relocate the residential gates to minimize dead-end drive aisles or provide sufficient space for a vehicle turn around.

- Redesign the Shellmound building garage entrance area to minimize vehicle conflicts and provide sufficient vehicle storage at the access intersection.

- Reconfigure guest parking in the Shellmound Street garage to provide sufficient space for vehicles to back out of the last spaces in each row.

- Install a parking space counting system at the Shellmound building garage to minimize excessive circulation through the site.

1. INTRODUCTION

This report presents the findings, recommendations, and conclusions of the Transportation Impact Analysis (TIA) for the Marketplace Redevelopment project (the "Project") in Emeryville, California. This chapter discusses the study purpose, analysis methods, criteria used to identify significant impacts, and report organization.

STUDY PURPOSE

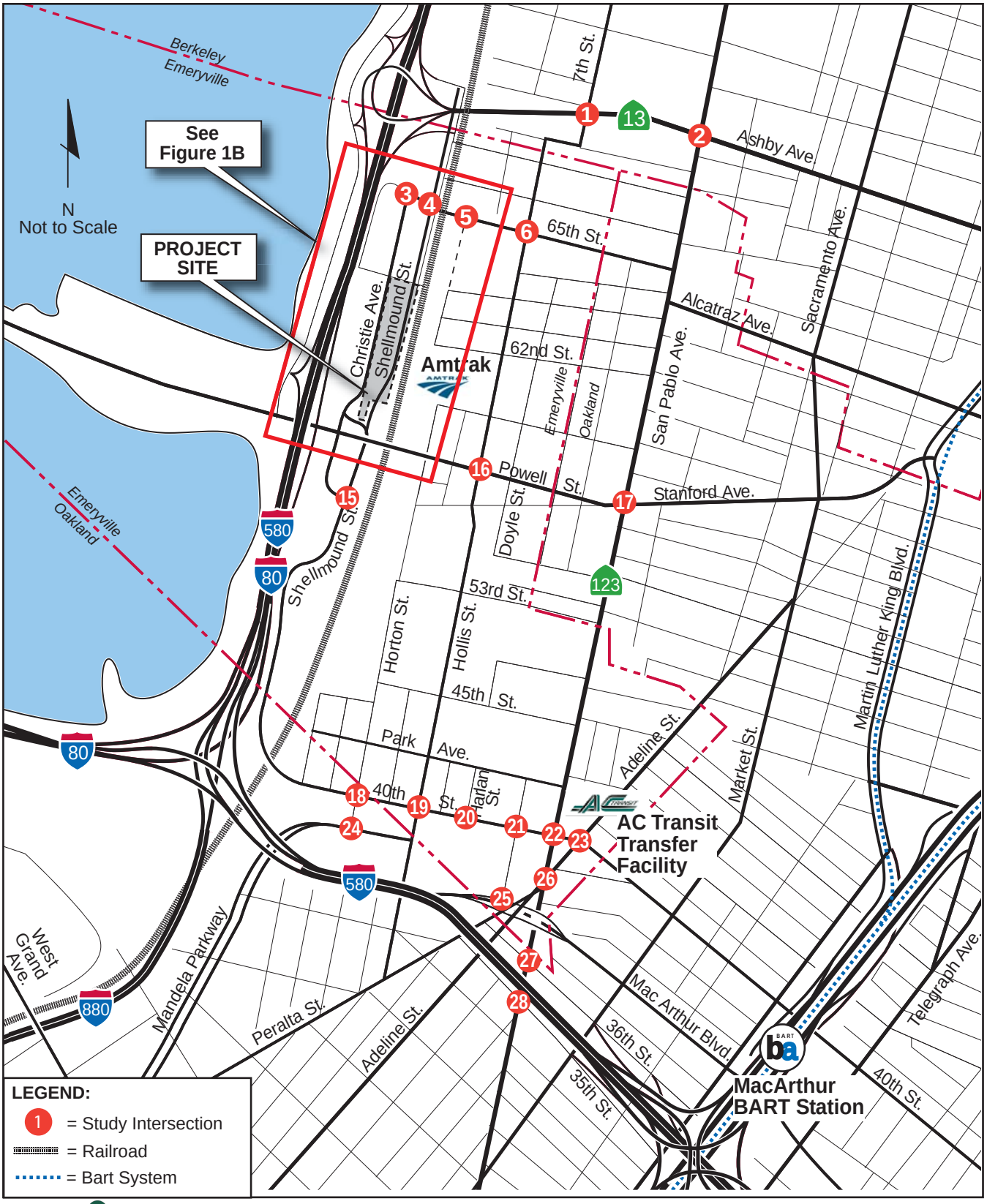
The study purpose is to evaluate the transportation impacts of the proposed Marketplace Redevelopment project, a mixed-use development containing offices, a movie theater, retail shops and restaurants. The redevelopment plan would increase the retail/restaurant square footage by up to 77,000 square feet and provide up to 340 residential units in addition to structured parking and reconfiguration of the surface parking area. The project would be phased to ensure adequate parking supplies are provided for existing site uses during construction. The Project site is generally bound by 64th Street to the north, the Southern Pacific Railroad to the east, Powell Street to the south and Christie Avenue to the west, as shown on Figure 1. The conceptual site plan is shown on Figure 2. Project site access would be provided by driveways on Shellmound Street, Christie Avenue, and 64th Street.

STUDY INTERSECTIONS AND FORECAST SCENARIOS

Project impacts to the roadway system were identified by evaluating the morning (7:00 – 9:00 AM) and evening (4:00 – 6:00 PM) peak period operations of selected intersections (listed below) under six scenarios. The Saturday peak period (2:00 – 4:00 PM) was evaluated at 15 study intersections (these locations are noted below with an asterisk). Operations at the driveways that serve the site were also evaluated for the AM, PM, and Saturday peak periods. The following 28 study intersections (shown on Figure 1) were selected in consultation with the City of Emeryville staff, as these are considered most likely to experience traffic impacts resulting from the project:

1. Ashby Avenue/7th Street
2. Ashby Avenue/San Pablo Avenue
3. 65th Street/Christie Avenue*
4. 65th Street/Shellmound Street*
5. 65th Street/Overland Avenue*
6. 65th Street/Hollis Street
7. 64th Street/Christie Avenue*
8. 64th Street/Shellmound Street*
9. Shellmound Way/Christie Avenue*
10. Shellmound Way/Shellmound Street*
11. I-80 Hook Ramps/Frontage Road*
12. Powell Street/Frontage Road*
13. Powell Street/I-80 Eastbound Ramps*
14. Powell Street/Christie Avenue *
15. Christie Avenue/Shellmound Street*
16. Powell Street/Hollis Street*
17. Stanford Avenue/San Pablo Avenue
18. 40th Street/Horton Street
19. 40th Street/Hollis Street
20. 40th Street/Harlan Street
21. 40th Street/Emery Street*
22. 40th Street/San Pablo Avenue*
23. 40th Street/Adeline Street
24. Mandela Pkwy/Horton Street
25. MacArthur Boulevard/Emery Street
26. Adeline Street/San Pablo Avenue
27. 36th Street/San Pablo Avenue
28. 35th Street/San Pablo Avenue

1. ***Existing Conditions*** – Existing peak hour conditions based on traffic volumes collected in 2005 and 2006 and the existing roadway network in place at the time of data collection.
2. ***Future Year 2010 Conditions*** – Existing peak hour traffic volumes plus estimated trips from approved and pending projects in the vicinity of the study area which are likely to be constructed by 2010.



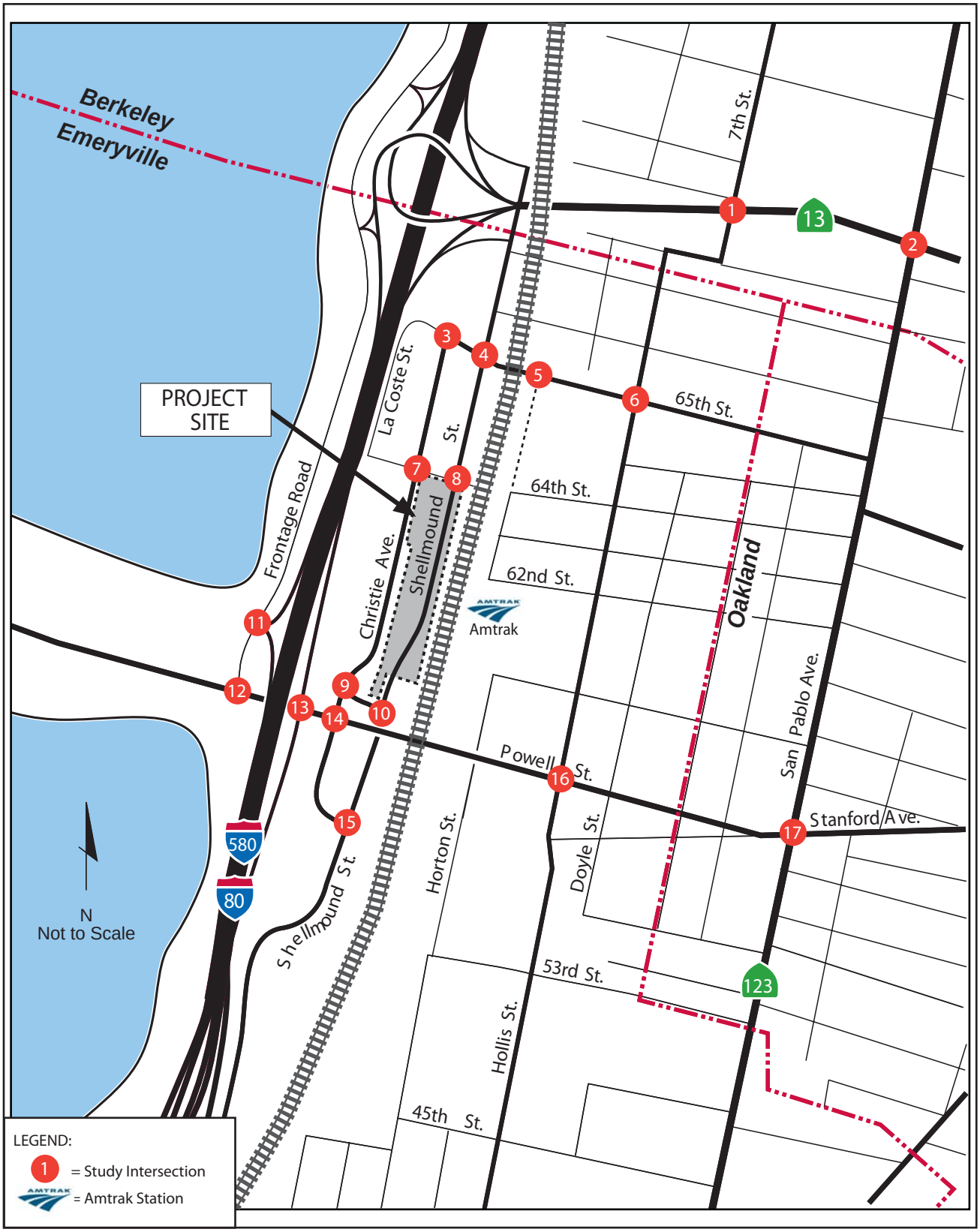
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

PROJECT SITE AND STUDY INTERSECTIONS

FIGURE 1A

February 2007
Graphics\Feb07 PDFs\WC05-2272_1A



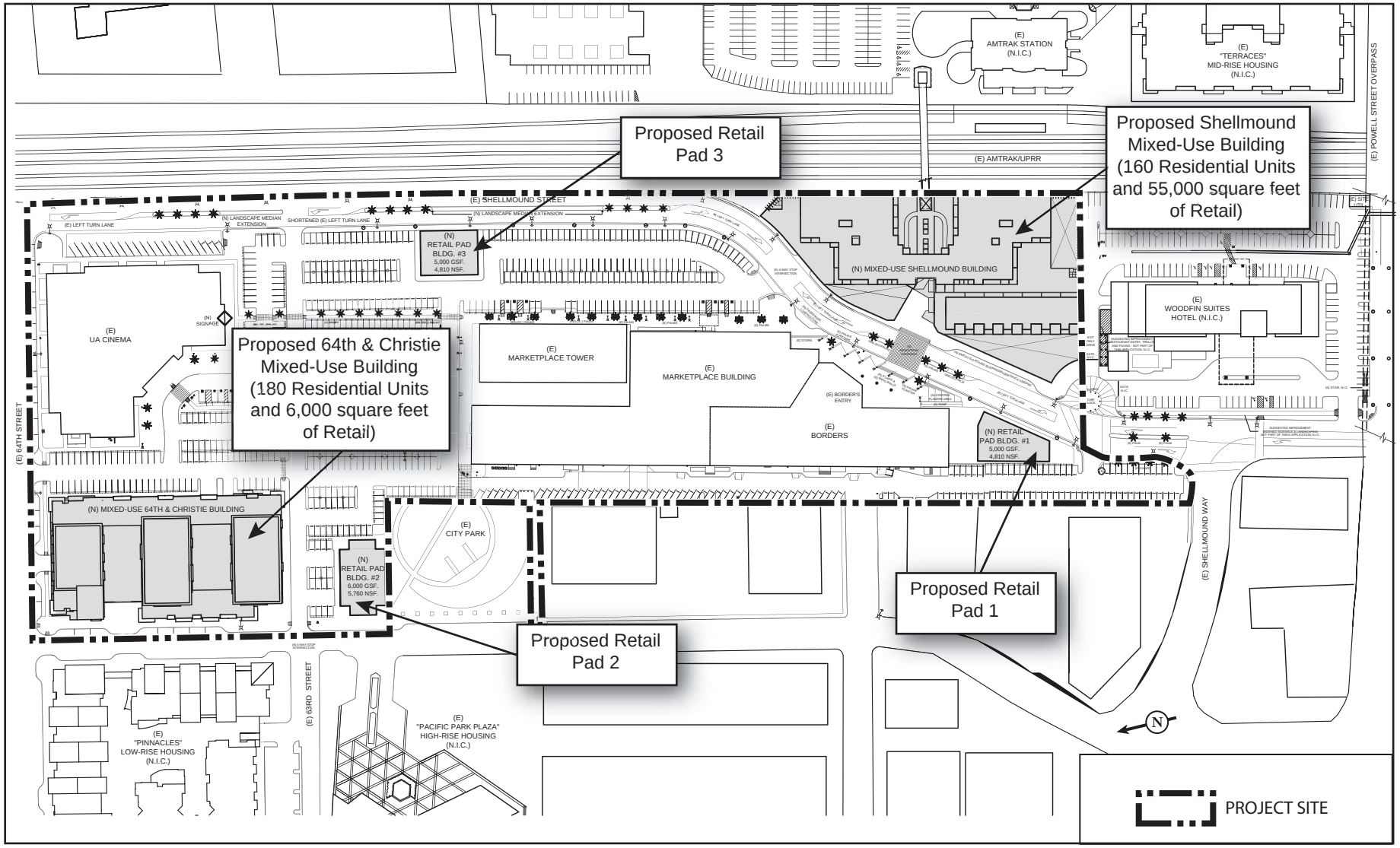
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_1B

Marketplace Redevelopment EIR

PROJECT SITE VICINITY AND STUDY INTERSECTIONS

FIGURE 1B



Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_2

CONCEPTUAL SITE PLAN

FIGURE 2

3. ***Future Year 2030 Conditions*** – Existing peak hour traffic volumes plus estimated trips from approved and pending projects in the vicinity of the study area which are likely to be constructed by 2030.
4. ***Existing Plus Project Conditions*** – Existing peak hour conditions as described above plus trips generated by the proposed project.
5. ***Future Year 2010 plus Project Conditions*** – Future Year 2010 Conditions as described above plus trips generated by the proposed project.
6. ***Future Year 2030 plus Project Conditions*** – Future Year 2030 Conditions as described above plus trips generated by the proposed project.

Other intersections were considered for this analysis, including:

- Christie Avenue/Powell Street Way
- Shellmound Street/Ohlone Way
- Shellmound Street/Bay Street
- Shellmound Street/Ikea Exit
- Shellmound Street/Ikea Entrance

Other studies prepared by Fehr & Peers evaluated these intersections, which are all projected to operate acceptability through 2030 with the addition of traffic from planned and pending projects, including the Marketplace project, and regional growth. As these intersections are projected to operate at acceptable service levels, no additional analysis was performed.

LEVEL OF SERVICE METHODS

Traffic operations at intersections are typically described in terms of "Level of Service" (LOS). LOS is a qualitative measure of the effect of several factors on traffic operating conditions including speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, and convenience. It is generally measured in terms of vehicular delay and described using a scale that ranges from LOS A to F, where LOS A represents free-flow conditions and LOS F indicates over-capacity conditions with substantial congestion and delay. The analysis of operating conditions at the study intersections was conducted using methods documented by the Transportation Research Board (TRB) in the 2000 *Highway Capacity Manual (HCM)*. For intersections, LOS is based on "control delay." Control delay is defined as the delay directly associated with the traffic control device (i.e., a stop sign or a traffic signal) and specifically includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. These delay estimates are considered meaningful indicators of driver discomfort and frustration, fuel consumption and lost travel time.

Micro-simulation was considered to evaluate operations on the Powell-Christies loop where vehicle queue spill-back can impact the operation of adjacent intersections during periods of peak congestion. Micro-simulation models follow the behavior of individual vehicles through the entire system, which is what generally makes them superior to macroscopic models such as Synchro. However, when vehicle demand exceeds the vehicle capacity of the system, which is what is expected in Emeryville in the future, the micro-simulation model begins to meter traffic flow entering the system. When traffic demand is metered into the system, the results from the simulation model often become meaningless. The study area is fairly large and as a result there is one major unintended consequence of using simulation to present the results. As vehicle demand exceeds vehicle capacity at the intersections located at the edges of the simulated roadway network, the amount of traffic getting into the system

begins to get metered. As the vehicle demand grows, the less traffic gets into the simulated roadway network. Therefore, it is possible that an intersection located inside the system will operate better due to effects of metering at the network edges. Using simulation under this occurrence can result in a misrepresentation of a project's impacts if the analyst does not fully understand the implications of using a system-wide approach to determine levels of service or project impacts at specific intersections.

The Synchro 6.0 software, which evaluates intersection operating conditions using the 2000 HCM methods, was used to evaluate operating conditions at unsignalized and signalized study intersections. Vehicle queuing was also evaluated at critical study intersections within the Powell/Christie Loop to quantify the affects of queue spillback on adjacent intersection operations.

Unsignalized Intersections

For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2000 HCM method for unsignalized intersections is used. For side-street stop-controlled intersections, the level of service is based on the average control delay per vehicle (measured in seconds) for each movement that must yield the right of way (movements on the stop-sign controlled approaches and left turns from the major street for side-street stop-controlled intersections), and is calculated individually. The largest experienced approach delay and average delay for the whole intersection are reported. For all-way stop-controlled intersections, the average control delay is calculated for the intersection as a whole. This incorporates delay associated with deceleration, acceleration, stopping and moving up in the queue. Table 1 summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 1
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL DELAY

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delays	< 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Signalized Intersections

For signalized intersections, the average control delay is calculated for the intersection as a whole. This incorporates delay associated with deceleration, acceleration, stopping and moving up in the queue. Table 2 summarizes the relationship between delay and LOS for signalized intersections.

REGULATORY SETTING

General Plan

The City of Emeryville General Plan was reviewed. General Plan Circulation Policy L calls for the establishment of "a citywide network of interconnected pedestrian and bicycle routes to provide access to major features, attractions and activities of the City, thus providing recreational benefits and reducing dependence on automobiles." To accomplish this goal, Policy L-2 calls for routes that minimize auto hazards and avoid heavily trafficked streets; Policy L-3 calls for integration of routes into regional networks.

TABLE 2
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS
USING AVERAGE CONTROL DELAY

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Significance Criteria

The City of Emeryville defines the acceptable service level for intersections as LOS D. A significant project impact would result if the project causes one of the following conditions to occur:

- The addition of project traffic degrades an intersection currently operating at LOS D or better to LOS E or LOS F
- The addition of project traffic degrades an intersection currently operating at LOS E to LOS F
- The addition of project traffic causes the average vehicle delay to increase by more than four seconds at an intersection operating at LOS E or LOS F
- The addition of project traffic results in the 95th percentile vehicle queue exceeding the available vehicle storage or at locations where vehicle queues would exceed the available storage space the project increases the 95th percentile vehicle queue

- The project would cause a roadway segment on the Metropolitan Transportation System to operate at LOS F or would increase the V/C ratio by more than five (5) percent for a roadway segment that would operate at LOS F without the project
- A substantial increase in hazards due to a design feature or incompatible land uses
- Inadequate emergency access
- Inadequate parking capacity
- If construction traffic from the project would have a significant, though temporary, impact on the environment or if project construction would substantially affect traffic flow and circulation, parking, and pedestrian safety
- Fundamentally conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle routes)
- Generate added transit ridership that would
    - increase the average ridership on AC Transit lines by five (5) percent at bus stops where the average load factor with the project in place would exceed 125 percent over a peak thirty minute period
    - increase the peak hour average ridership on BART by five (5) percent where the passenger volume would exceed the standing capacity of BART trains
    - increase the peak hour average ridership at a BART station by five (5) percent where average waiting time at fare gates would exceed one minute

REPORT ORGANIZATION

This report is divided into eight chapters, including this introductory chapter, as described below:

- ***Chapter 1*** – ***Introduction*** discusses the purpose and organization of this report.
- ***Chapter 2*** – ***Existing Setting*** describes the project vicinity including the surrounding roadway network, weekday morning (AM), evening (PM), and Saturday afternoon peak-hour vehicle traffic volumes, and intersection service levels.
- ***Chapter 3*** – ***Project Characteristics*** presents relevant project information, such as project components and project trip generation, distribution, and assignment.
- ***Chapter 4*** – ***Traffic Forecasts*** describes the method used to determine baseline traffic volumes for the 2010 and 2030 scenarios.
- ***Chapter 5*** – ***Off-Site Impacts and Recommendations*** addresses future conditions with the addition of project traffic.
- ***Chapter 6*** – ***Alameda County Congestion Management Agency (ACCMA) MTS Roadway Analysis*** presents the impacts of the Project on the Metropolitan Transportation System (MTS) roadway system.
- ***Chapter 7*** – ***Pedestrian, Bicycle, and Transit Impacts*** addresses impacts to alternative modes of transportation in the study area.
- ***Chapter 8*** – ***Site Access, Circulation, and Parking*** describes project access, circulation, and parking issues as they relate to the project.
- ***Chapter 9 – Project Alternatives*** provides a quantitative assessment of the relative impacts of three alternatives to the proposed Project.

2. EXISTING SETTING

This section describes the existing roadway network and intersection operations as well as transit, bicycle and pedestrian facilities in the study area.

EXISTING ROADWAY NETWORK

The Marketplace Redevelopment project site is located south of 64th Street, east of Christie Avenue and along Shellmound Street just north of Shellmound Way in Emeryville. Existing land uses near the project site are primarily residential and commercial. A hotel is located south of the project site. A description of roadways in the project vicinity is provided below. Regional access to the project site is provided by Interstate 80 (I-80) and Interstate 580 (I-580), while a number of arterials and local roads provide local access. Existing lane configurations and traffic controls are shown on Figure 3 for each study intersection. The lane configurations shown on Figure 3 represent conditions when the traffic counts were collected.

I-80 connects the San Francisco Bay Area with the Sacramento region and continues east across the United States. In Emeryville, I-80 has a north/south orientation and provides four mixed-flow lanes and a high occupancy vehicle (HOV) lane in each direction at the Ashby Avenue/Shellmound Street interchange (Emeryville/Berkeley border). Access from I-80 to Emeryville is provided via interchanges at Powell Street and Ashby Avenue. This segment of I-80 through Emeryville is also known as I-580.

I-580 extends in an east/west direction, from San Rafael toward Tracy and the San Joaquin Valley. In the vicinity of Emeryville, I-580 parallels the southern city boundary with five lanes in each direction. Access to Emeryville from I-580 westbound is provided at West Street via ramps along 35th and 36th Streets; access to Emeryville from I-580 eastbound is provided via a left-hand exit to Emery and Adeline Streets.

Christie Avenue is generally a two-lane, north/south road extending north from Shellmound Street to 65th Street. Existing land uses along Christie Avenue include office, retail and residential.

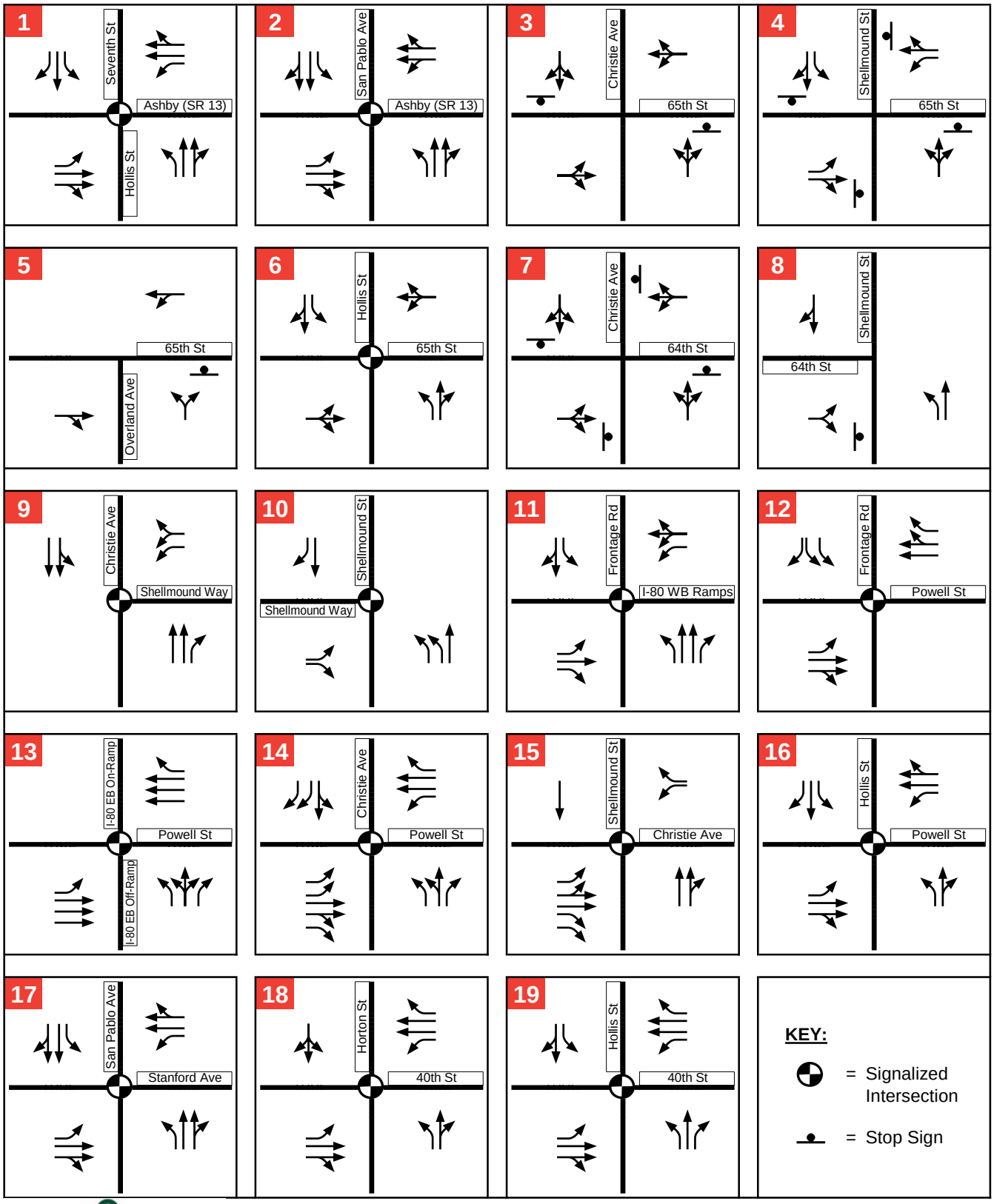
64th Street is a two-lane east/west road extending east from Lacoste Street to Shellmound Street. On-street parking is allowed on the section of roadway near the study area. The roadway terminates at Shellmound Street due to railroad tracks but continues east of the tracks to San Pablo Avenue.

Shellmound Street is a two- to four-lane north/south road with on-street parking at select locations. Shellmound Street becomes 40th Street to the south of the railroad overcrossing, continuing east beyond the MacArthur BART station. Shellmound Street continues as Bay Street north of Ashby Avenue, where access to I-80 is provided.

Shellmound Way is a short four-lane east/west road street connecting Christie Avenue and Shellmound Street. On-street parking is prohibited on Shellmound Way.

Powell Street is an east/west road, generally with four lanes, with an interchange at I-80. It extends west from I-80 to the Emeryville Marina, and east from I-80 to west of San Pablo Avenue, where it becomes Stanford Avenue and continues to Adeline Street.

65th Street is a two-lane, east/west road extending east from Lacoste Street. Land uses along 65th Street include residential, commercial, and office, and on-street parking is generally available. An at-grade signalized railroad crossing is located just east of Shellmound Street. Approximately 55 trains per day use this crossing. An accident occurred at this location in 2002 when an auto collided with a passenger train. One injury was reported.



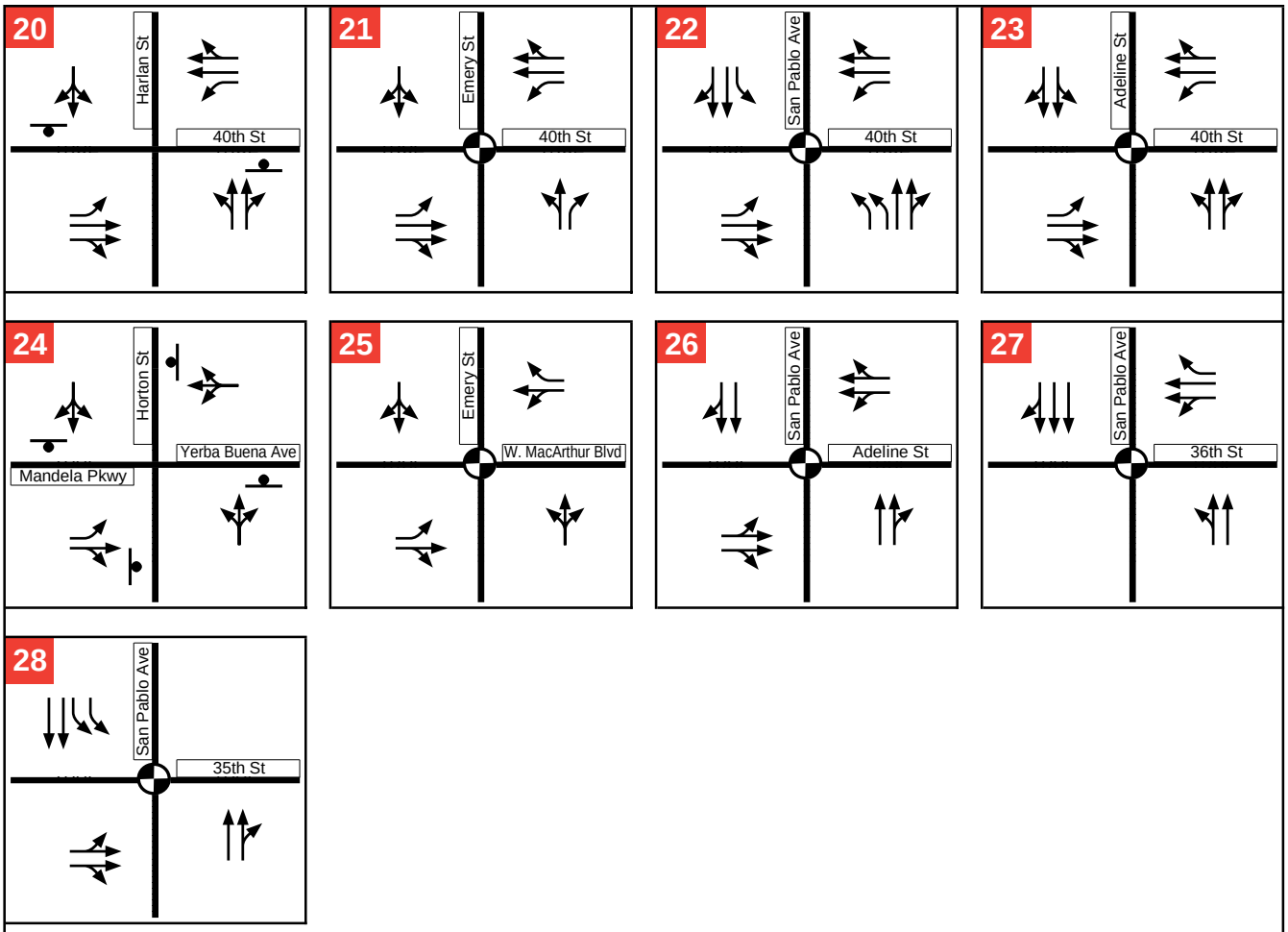
Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

February 2007
Graphics\Feb07 PDFs\WC05-2272_3A

FIGURE 3A



Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

February 2007
Graphics\Feb07 PDFs\WC05-2272_3B

FIGURE 3B

Hollis Street is a two-lane, north/south road, with on-street parking that begins in Oakland at Peralta Street and ends in Berkeley at Folger Avenue. North of Folger Avenue, Hollis Street becomes 7th Street extending northward through Berkeley.

EXISTING TRAFFIC VOLUMES

Intersection operations were analyzed for the weekday AM (7:00 to 9:00 AM), PM (4:00 to 6:00 PM) and Saturday afternoon (2:00 to 4:00 PM) peak periods. Intersection operations were evaluated for the one hour during each count period with the highest measured traffic volumes. Intersection counts were conducted in the spring of 2005 and Fall of 2006 on clear days with area schools in normal session. Existing peak-hour traffic volumes at each study intersection are shown on Figure 4 for the weekday peak hours and Figure 5 for the Saturday peak hours. Traffic counts at the study intersections are provided in Appendix A.

EXISTING TRANSIT SERVICE

Transit service in the vicinity of the project site is provided by a local service called Emery Go Round, Alameda-Contra Costa Transit (AC Transit), Bay Area Rapid Transit (BART), and Amtrak.

Emery Go Round

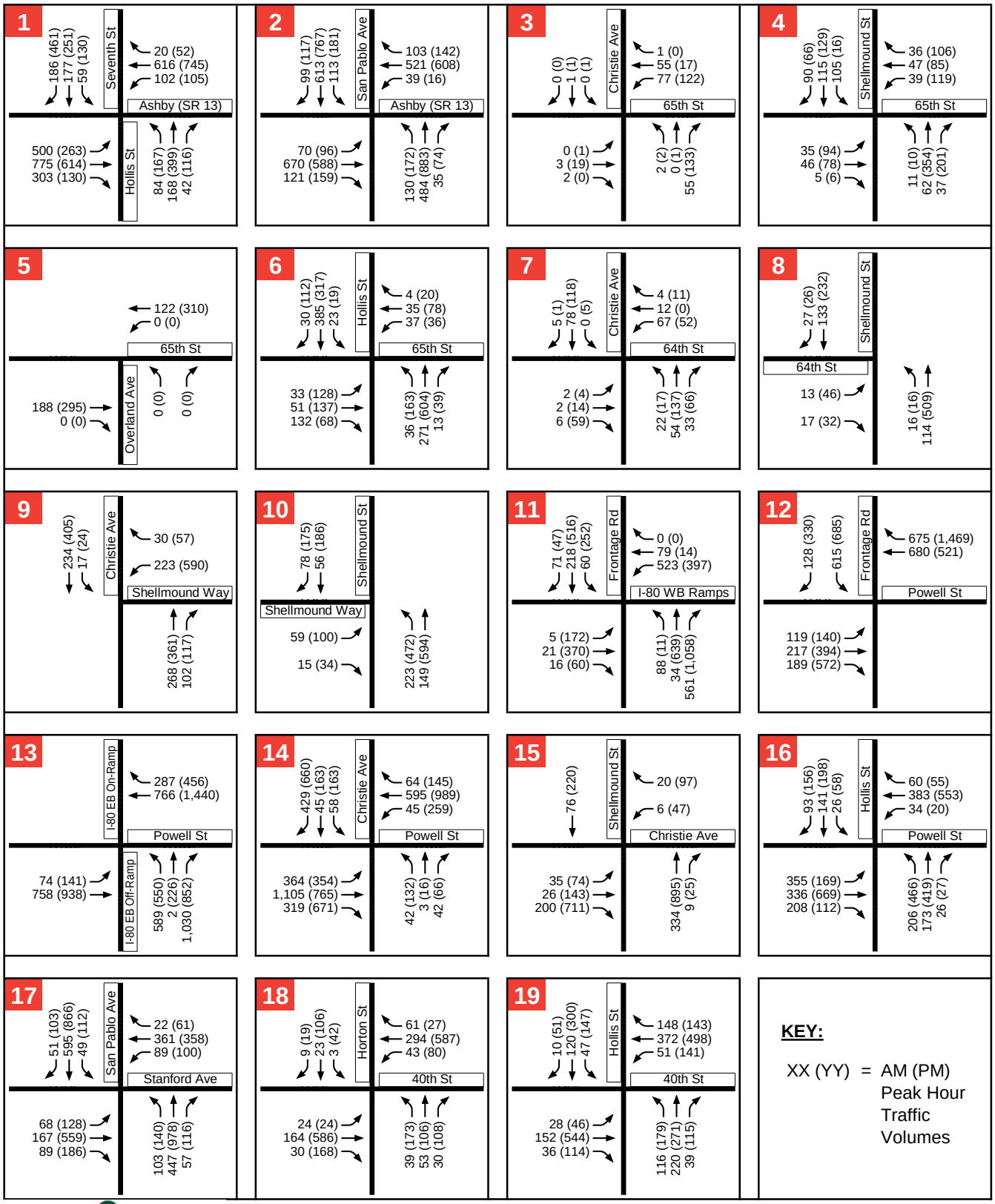
The Emery Go Round, operated by the Emeryville Transit Management Association, provides free wheelchair accessible shuttle bus service connecting major employment, retail, and residential centers in Emeryville to the MacArthur BART and Emeryville Amtrak stations and other points in Emeryville throughout the day. Two weekday and two weekend routes serve the Emeryville area.

The weekday ***Hollis*** and ***Powell*** routes generally operate from 5:45 AM to 10:30 PM on 10- to 12-minute headways, scheduled to meet BART trains at the MacArthur BART Station. The weekday Powell route travels along Shellmound Street, 65th Street, Christie Avenue, Powell Street and Shellmound Way. The Powell route serves destinations including the Bay Street retail area, Pacific Park Plaza and Watergate Condominiums. Stops are provided on Christie Avenue, south of 64th Street along the project frontage. The Hollis route provides service to the Amtrak station and major employers including Pixar and Chiron. The Hollis route travels along 65th Street and Hollis Street in the study area.

Two routes serve the major retail areas of Emeryville, including the project site, on weekends. The weekend ***Shopper*** route operates on 30-minute headways from 9:20 AM to 9:50 PM on Saturdays and 40-minute headways from 10:20 AM to 7:00 PM on Sundays. The ***Saturday City Loop*** route operates on 40-minute headways from 10:20 AM to 7:00 PM on Saturdays. Both routes serve the MacArthur BART station. The Shoppers Express provides service to the project site along Christie Avenue and Shellmound Street and also serves the Bay Street retail area. The City Loop serves destinations on Hollis Street and Powell Street, including the Amtrak Station, Pacific Park Plaza and Watergate Condominiums. Stops along the project frontage are provided on Christie Avenue south of 64th Street.

AC Transit

AC Transit operates three local routes and one Transbay route in the vicinity of the project study area. Two routes (Route 57, Route Z, and Route 9) operate along the project frontage.



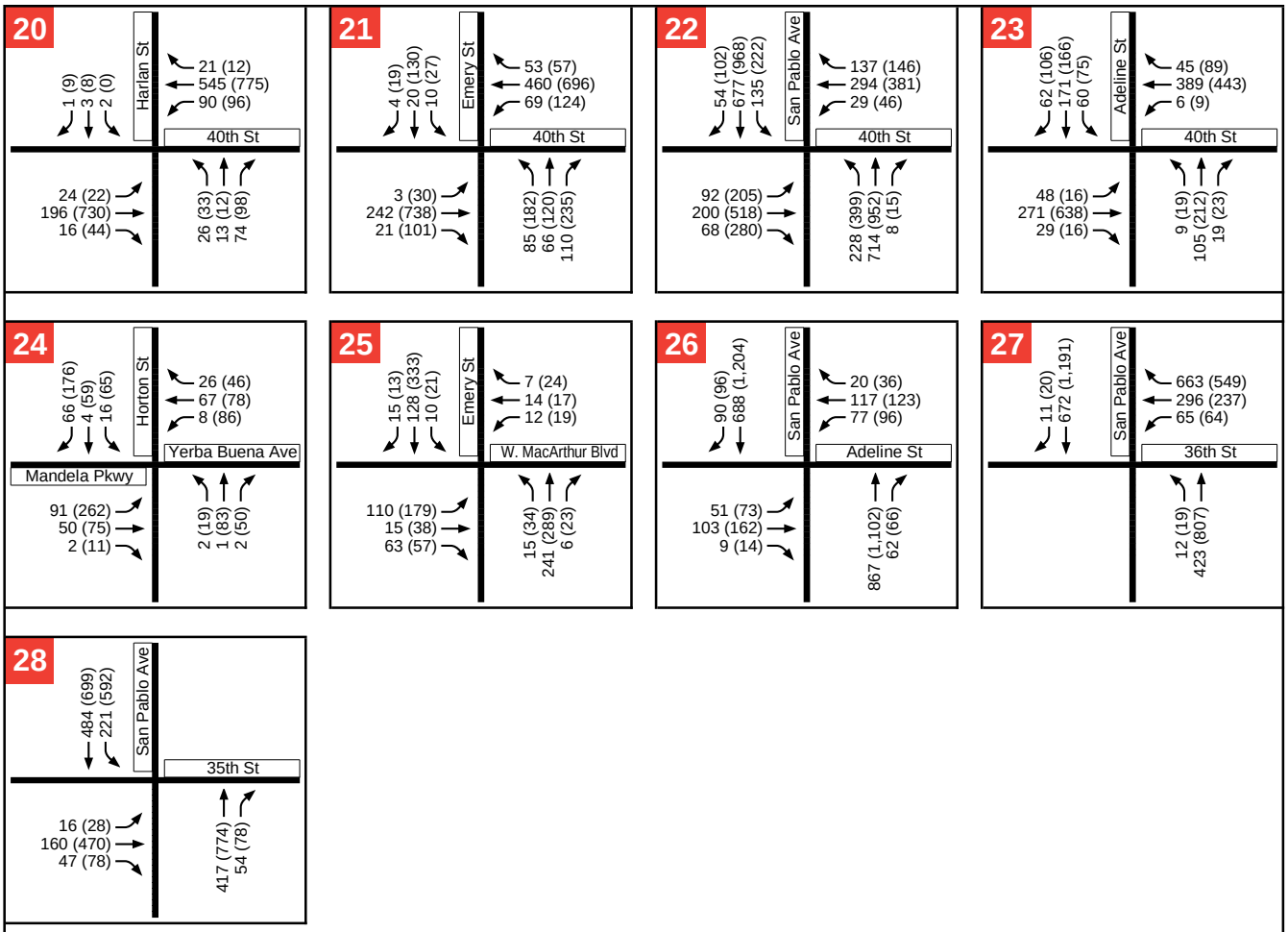
Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING WEEKDAY PEAK HOUR TRAFFIC VOLUMES

February 2007
Graphics\Feb07 PDFs\WC05-2272_4A

FIGURE 4A



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

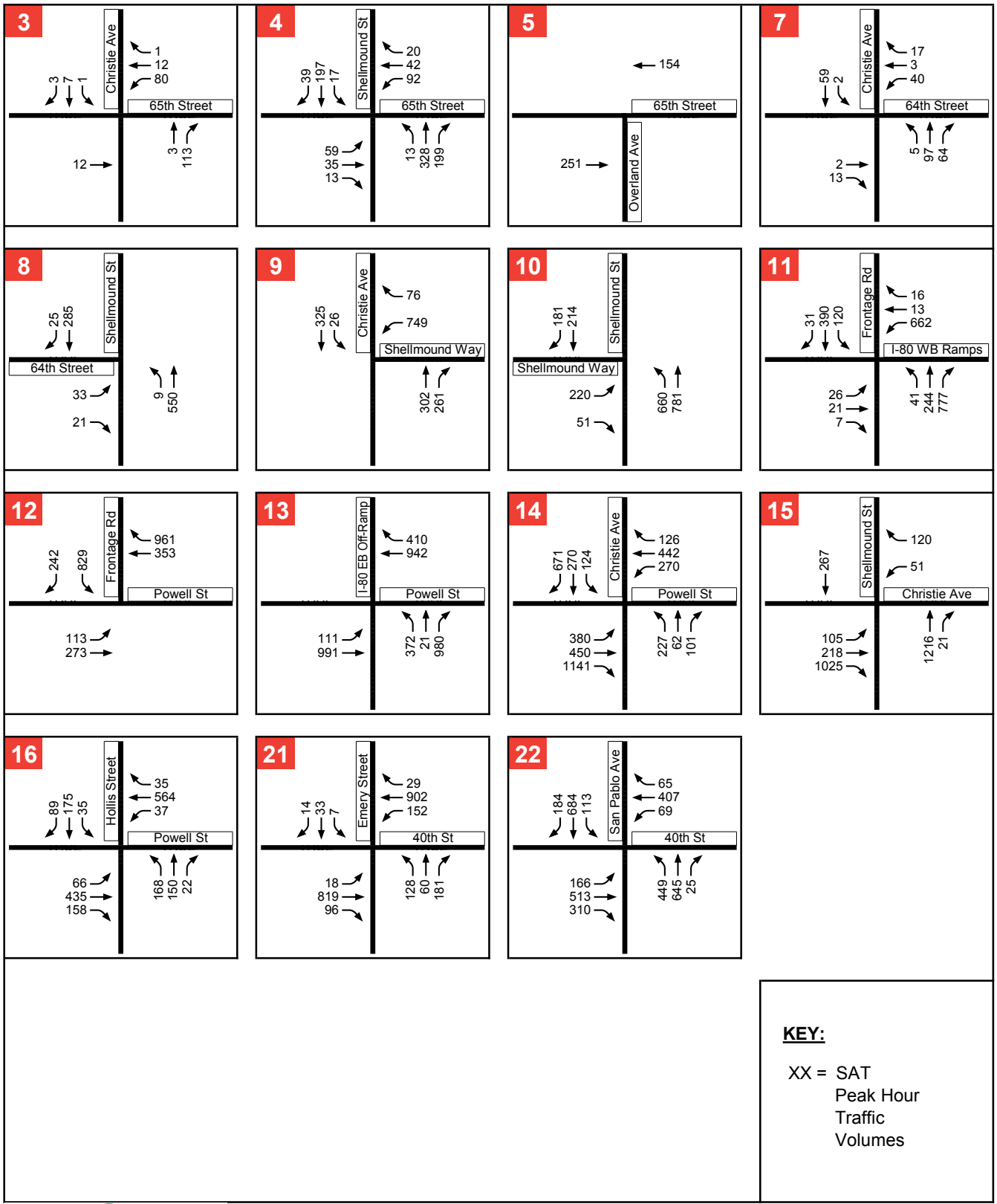
Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 4B

February 2007
Graphics\Feb07 PDFs\WC05-2272_4B



KEY:

XX = SAT Peak Hour Traffic Volumes

Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING SATURDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 5

February 2007
Graphics\Feb07 PDFs\WC05-2272_5

Route 57 operates around the project site on Shellmound Way, Christie Avenue, 64th Street and Shellmound Street in a clockwise direction, providing service between the Emeryville Marketplace and the MacArthur BART station via 40th Street in the study area. Weekday service is provided from 4:00 AM to 1:00 AM with 10- to 15-minute headways. Weekend service is provided from 4:30 AM to 1:00 AM with 15- to 30-minute headways. A layover area is provided on 64th Street in the project vicinity, with stops located on Christie Avenue and Shellmound Street that serve the project site.

Route Z provides weekday Transbay service between the San Francisco Transbay Terminal and the City of Albany. In the study area, Route Z operates on 65th Street, Christie Avenue and Powell Street. Eastbound service is provided from 7:00 to 9:00 AM and westbound service is provided from 4:30 to 7:00 PM on 30-minute headways. A stop in the study area is provided near the Powell Avenue/Christie Avenue intersection.

Route 19 connects the North Berkeley BART and Fruitridge BART stations via Hollis Street in the study area. Daily service is provided between 6:00 AM and 10:00 PM on 30-minute headways. Access to the project site from this transit line would be provided via the pedestrian over-crossing at the Amtrak station.

Route C provides weekday Transbay service between the San Francisco Transbay Terminal and Piedmont. In the study area, Route C operates on Shellmound Street, Shellmound Way, Christie Avenue and Powell Street. Westbound service is provided from 5:00 AM to 12:30 AM, generally on 30-minute headways. Eastbound service is not provided in Emeryville. A stop in the study area is provided near the Powell Avenue/Christie Avenue intersection.

Route F provides weekday and weekend Transbay service between the San Francisco Transbay Terminal and the City of Berkeley. In the study area, Route F operates on Shellmound Street, Shellmound Way, Christie Avenue and Powell Street. Westbound service is provided from 5:00 AM to 12:30 AM, generally on 30-minute headways. Eastbound service is provided from 5:45 AM to 12:30 AM, generally on 30-minute headways. A stop in the study area is provided near the Powell Avenue/Christie Avenue intersection.

Route J provides weekday Transbay service between the San Francisco Transbay Terminal and the City of Berkeley. In the study area, Route J operates on Christie Avenue. Westbound service is provided between 6:00 and 8:45 AM. Eastbound service is not provided in Emeryville.

Bay Area Rapid Transit (BART)

BART provides regional rail commuter transit service. The closest station to the site is the MacArthur BART Station, located approximately 2 miles east of the project site on 40th Street. Three of BART's five lines pass through the MacArthur Station, providing direct service from MacArthur to Richmond, Bay Point, Fremont, San Francisco, and Millbrae without transferring. BART service from Fremont/Daly City and Dublin/Pleasanton/SFO does not pass through the MacArthur Station.

Amtrak

A pedestrian overcrossing connects the project site to the Emeryville Amtrak train station and is located near Horton Street/59th Street. Four Amtrak routes serve this station, including the Capitol Corridor and San Joaquin commuter service routes. The Capitol Corridor route connects San Jose to the Sacramento region with approximately 24 trains per day, and the San Joaquin route connects the Oakland/Emeryville area to Bakersfield, with approximately 8 trains per day. The Coast Starlight route (which connects Seattle to Los Angeles) and the

California Zephyr route (which connects the Oakland/Emeryville area to Chicago, Illinois) also serve the Emeryville Station, each with one train per day.

EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Bicycle Facilities

Bicycle facilities can be classified in three categories:

- Class I (Bike Paths) – A Class I bicycle facility provides a bicycle path for the exclusive use of bicycles and pedestrians, separate from the auto travel-way. The State standard for minimum width of a two-way bicycle path is eight feet with a two-foot shoulder on either side.
- Class II (Bike Lanes) – A Class II bicycle facility is an on-street bicycle lane, with painted markings and signs designating the lane's bicycle-only use. The bicycle lane is separated from vehicle and pedestrian traffic, but the route may be interrupted by pedestrian crossings, vehicle turning movements or parked vehicles. The width for a one-way bicycle lane varies depending upon on-street parking facilities and the type of curb and gutter, but is generally 5 feet or greater.
- Class III (Bike Routes) – A Class III bicycle facility is a route for bicyclists usually shared by either vehicles or pedestrians. The facility is designated by signs or other markings, and is usually provided when a Class I or Class II facility cannot be provided.

In Emeryville, the San Francisco Bay Trail follows the shoreline south from the Berkeley border to the EmeryCove Marina. The Class I facility veers east on Powell Street and terminates at the Powell Street/Christie Avenue intersection. The trail then continues south as a Class II facility on Shellmound Street. At this time, there are no bicycle facilities provided on Christie Avenue between Powell Street and Shellmound Way.

The pedestrian overcrossing connecting the project site and the Amtrak station is accessible to bikes via elevators, connecting to a Class II facility on 59th Street from Horton Street to Hollis Street. Class II Bike Lanes are provided on Shellmound Street through the site as well as on 65th Street from Shellmound Street to Overland Avenue. Horton Street from 62nd Street to 53rd Street is also a Class II facility. North of 62nd Street, a Class III Bike Route is provided on Overland Avenue to 65th Street. Bike lanes are not provided on Hollis Street; although it is not uncommon for bicyclists to use the corridor. Horton Street from 40th street to the northern City limits has been designated as a bicycle boulevard to encourage bicycle trips and discourage vehicle trips on this roadway.

The City's bicycle and pedestrian plan identifies proposed bicycle facility improvements on 65th Street, 59th Street and Powell Street. The Class II facility on 65th Street and the Class III facility on 59th Street would extend east of Vallejo Street, past the city's boundary. An extension of the Class I facility on Powell Street from its existing termination point at Christie Avenue to Shellmound Street is proposed. This would provide a continuous bicycle network from the San Francisco Bay Trail to the Class II facility on Shellmound Street.

Pedestrian Facilities

Pedestrian facilities in the study area are comprised of sidewalks, crosswalks and pedestrian signal heads. A pedestrian overcrossing connecting the Amtrak Station to the Public Market provides access to the Marketplace site. High levels of mid-day pedestrian activity are present on this overcrossing and other nearby crosswalks on Shellmound Street. Of the three available crosswalks near the Public Market, the northern, all-way stop controlled intersection is the most heavily used followed by the striped crosswalk and finally, the southern

intersection just north of the Shellmound Street/Shellmound Way intersection. Generally, mid-day pedestrians arrive at and cross Shellmound Street in random groups, disrupting vehicular traffic flows. This is particularly noticeable at the all-way stop controlled intersection where pedestrian crossings reduce vehicle efficiency through the intersection. In addition to crosswalks at the intersections, a striped crosswalk on Christie Avenue provides access between the City Park and the Pacific Park Plaza. Pedestrian facilities are also provided on the Powell Street bridge, south of the Woodfin Hotel.

Extensive pedestrian facilities are provided on the existing Marketplace site. Generally, sidewalks and striping provide clear signage of pedestrian paths through the parking lot. A tree-shaded walkway crossing the parking lot is provided from the Marketplace Building to the UA Theater. However, there are some existing deficiencies on the project site, such as the sidewalk along the northern edge of the Marketplace Building which is discontinuous and does not connect to the City Park pathway. These deficiencies would be improved with the project.

EXISTING INTERSECTION OPERATING CONDITIONS

The existing traffic volumes with existing lane configurations and traffic control were used to analyze existing peak hour operating conditions at the study intersections. As shown in Table 3 below, all study intersections currently operate at acceptable service levels during the weekday AM and PM, and Saturday peak hours, except for the I-80 EB Ramps/Powell Street and Shellmound Steet/65th Street intersections. A traffic signal has been installed at the Shellmound Steet/65th Street intersection, which was recently activated. However, as the traffic counts were collected when the intersection was unsignalized, that configuration was used in the intersection analysis. With signalization, this intersection would operate at LOS B during the PM peak hour. Detailed LOS calculation worksheets can be found in Appendix B.

TABLE 3
EXISTING PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	43 42	D D
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	32 40	C D
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street[3]	AWSC	AM PM SAT	9 50 29	A E D
5. 65th Street/Overland Avenue[3]	--	AM PM SAT	-- -- --	-- -- --
6. 65th Street/Hollis Street	Signal	AM PM	14 23	B C
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 8	A A A

TABLE 3
EXISTING PEAK HOUR INTERSECTION OPERATING CONDITIONS

8. 64th Street/Shellmound Street	SSSC	AM PM SAT	1 (10) 2 (16) 1 (16)	A (A) A (C) A (C)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	8 11 17	A B B
10. Shellmound Way/Shellmound Street	Signal	AM PM SAT	33 22 13	C C B
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	15 37 16	B D B
12. Powell Street/Frontage Road	Signal	AM PM SAT	19 18 22	B B C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM PM SAT	26 73 56	C E E
14. Powell Street/Christie Avenue	Signal	AM PM SAT	29 46 46	C D D
15. Christie Avenue/Shellmound Street	Signal	AM PM SAT	20 41 31	B D C
16. Powell Street/Hollis Street	Signal	AM PM SAT	30 51 24	C D C
17. Stanford Avenue/San Pablo Avenue	Signal	AM PM	29 39	C D
18. 40th Street/Horton Street	Signal	AM PM	21 28	C C
19. 40th Street/Hollis Street	Signal	AM PM	26 38	C D
20. 40th Street/Harlan Street	SSSC	AM PM	3 (24) 5 (53)	A (C) A (F)
21. 40th Street/Emery Street	Signal	AM PM SAT	24 32 21	C C C
22. 40th Street/San Pablo Avenue	Signal	AM PM SAT	33 45 39	C D D
23. 40th Street/Adeline Street	Signal	AM PM	12 12	B B

TABLE 3
EXISTING PEAK HOUR INTERSECTION OPERATING CONDITIONS

24. Mandela Pkwy/Horton Street	AWSC	AM PM	8 14	A B
25. MacArthur Boulevard/Emery Street	Signal	AM PM	24 11	C B
26. Adeline Street/San Pablo Avenue	Signal	AM PM	15 19	B B
27. 36th Street/San Pablo Avenue	Signal	AM PM	28 24	C C
28. 35th Street/San Pablo Avenue	Signal	AM PM	13 30	B C

Notes:

1. SSSC = side-street stop-controlled intersection; AWSC = all-way stop-controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop-controlled intersections. Average intersection delay and (worst case approach delay) reported for side-street stop-controlled intersections.
3. Intersection counts were conducted prior to signal activation.

Source: Fehr & Peers, 2007.

Traffic operations at the I-80 EB Ramps/Powell Street and Christie Avenue/Powell Street intersections are highly influenced by lane utilization imbalances. This occurs when vehicles do not equally distribute across all traffic lanes for a specific movement. For example, drivers exiting eastbound I-80 tend to queue in the outside or curb lane when making a right turn onto Powell Street rather than use the second lane which also allows for right turn movements onto Powell Street.

The small turning radius for the off-ramp right-turn traffic is one reason that drivers prefer the curb lane. Many drivers exiting I-80 eastbound are destined to the right turn onto Christie Avenue at Powell Street. The small turning radius for off-ramp right-turning traffic does not permit vehicles to enter directly into the exclusive eastbound right-turn lane at the Christie Avenue/Powell Street intersection. Instead, vehicles generally enter into the shared eastbound through/right-turn lane, forcing drivers in the second off-ramp right-turn lane to turn into either the left turn lanes or possibly one of the through lanes at the Christie Avenue/Powell Street intersection. The resulting condition causes lane utilization imbalances at the off-ramp causing long delays and vehicle queues at the off-ramp. Similar lane imbalances occur on eastbound Powell Street approaching Christie Avenue.

Lane imbalances also occur on westbound Powell Street between Christie Avenue and Frontage Road. These imbalances occur because drivers are unsure which lane to use to access westbound I-80 toward San Francisco. The severe lane offset (about 12 feet) on westbound Powell Street through the I-80 EB Ramp traffic signal combined with the overhead sign structure direct drivers to the outside most lane; whereas, drivers could use either the outside most lane or the second lane to access Frontage Road and the I-80 westbound on ramp to San Francisco. The inside most lane or third lane is used by drivers destined for the marina area. The lane imbalances have secondary impacts at the Shellmound Way/Christie Avenue intersection, north of Powell Street.

Drivers trying to avoid congestion on I-80 exit the freeway at Powell Street and travel through the intersection to re-enter the freeway via the on-ramp. While this occurrence is minimal during the AM and Saturday peak hours, traffic counts during the PM peak hour indicate that over 200 vehicles exit the freeway, only to re-enter. This occurrence was verified during field observations and tends to occur more when I-80 is operating at capacity.

This occurrence contributes to congestion at the I-80 EB Ramps/Powell Street intersection and reduces the capacity for left and right-turning vehicles at the off-ramp.

Capacity constraints also occur at the Powell Street/Christie Avenue intersection. The southbound Christie Avenue approach between Shellmound Way and Powell Street has two exclusive right-turn lanes and a shared through/left-turn lane. There is excess demand for the combination through/left-turn lane so drivers often use one of the exclusive right-turn lanes to travel straight through the intersection; thereby reducing the right turning vehicle capacity. The eastbound to southbound left-turn lane from Powell Street onto Christie Avenue toward Powell Plaza is a single lane. Vehicle queues were observed extending beyond the storage area for left turning traffic, thereby blocking westbound traffic through the intersection.

A queue spillback analysis was conducted, as shown on Table 4. The 95th percentile vehicle queue, as calculated by Synchro 6.0, is shown for critical intersections in the Powell/Christie Loop that could be potentially impacted by the proposed project. The vehicle queues as calculated by Synchro generally coincide with field observed queues. Detailed queuing worksheets are provided in Appendix C.

TABLE 4
EXISTING VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	95th Percentile Queue Length (in feet) [1]		
			AM	PM	Saturday
Shellmound Way/ Christie Avenue	Northbound	235	25	25	100
	Southbound	--	100	150	150
	Westbound	335	25	250	250
Shellmound Way/ Shellmound Street	Northbound left	400	75	125	225
	Southbound right	200	50	100	75
	Southbound through	--	50	175	200
	Eastbound	335	100	50	75
Powell Street/I-80 Eastbound Ramps	Northbound left	900	500	725	325
	Northbound through	900	600	900	325
	Northbound right	900	550	1,050	850
	Westbound through	400	100	350	325
	Westbound right	400	25	75	150
	Eastbound left	275	50	175	150
	Eastbound through	275	150	100	375
Powell Street/ Christie Avenue	Northbound left	200	50	125	250
	Northbound through	200	50	125	250
	Northbound right	200	50	75	75
	Southbound Through	235	125	350	475
	Southbound Right	235	25	50	100
	Westbound left	200	50	400	425
	Westbound through	--	150	575	200
	Westbound right	50	50	150	100
	Eastbound left	400	175	175	150
	Eastbound through	450	550	300	275
	Eastbound Right	450	25	350	425

Notes: 1. 95th percentile vehicle queue in feet as calculated by Synchro 6.0.
Source: Fehr & Peers, 2007.

3. PROJECT CHARACTERISTICS

This chapter describes the procedure used to develop project traffic estimates, including project trip generation, distribution, and assignment characteristics. The results are used to evaluate potential impacts the project would have on the surrounding roadway network.

PROJECT DESCRIPTION

The Marketplace Redevelopment project is the coordinated redevelopment of the Marketplace site and the adjacent 64th & Christie site in Emeryville, California. The project area is generally bound by 64th Street to the north, the Southern Pacific Railroad to the east, Powell Street to the south and Christie Avenue to the west. Construction would occur on five sites: Shellmound Building, Retail Pad #1, Retail Pad #2, Retail Pad #3, and 64th & Christie building, as shown previously on Figure 2.

Development in the Shellmound building would consist of up to 55,000 square feet of retail and 160 residential units in addition to structured parking. Up to 7,500 square feet of retail/restaurant would be constructed on Pad #1 (adjacent to Borders book store), up to 7,500 square feet of retail/restaurant would be constructed on Pad #2 (adjacent to City Park), and up to 7,500 square feet of retail/restaurant would be constructed on Pad #3, south of the UA Cinema and adjacent to Shellmound Street. The combined total size of pads 1, 2, and 3 would not exceed 16,000 square feet. On the 64th & Christie site, the project includes construction of a mixed residential/ retail building with structured parking, including 180 residential units in addition to 6,000 square feet of ground floor retail. This reflects the maximum development on the site. The actual project would likely be smaller due to space constraints on the site and market conditions. As restaurant uses could potentially occupy the retail space, it was assumed that 11,000 square feet of restaurants would be developed.

PROJECT TRIP GENERATION

Project trip generation refers to the process for estimating the amount of vehicular traffic a project would add to the surrounding roadway system. First, estimates of the total amount of traffic entering and exiting the project driveways are calculated for an average weekday. Separate estimates are created for the peak one-hour periods during the morning and evening commute periods when traffic volumes on the surrounding streets are highest. At retail establishments such as the proposed project, driveway traffic comprises: (1) new traffic generated by the project, (2) traffic that would otherwise already be on the adjacent roadways but the driver decides to stop at the site (e.g., to purchase an item on their way home from work), and (3) traffic on other nearby roadways, but the driver decides to take a short detour to stop at the site. The trips in Item 2 are referred to as “pass-by” trips and the trips in Item 3 are referred to as “diverted-link” trips.

Estimates for the shopping center portion of the project were developed by using trip generation rates contained in the Institute of Transportation Engineers (ITE), *Trip Generation,* (7th Edition) (Land Use Code 820 – Shopping Center). Information contained in the ITE *Trip Generation Handbook*, June 2004, was used to estimate pass-by and diverted-link trips. For shopping centers, the average pass-by rate is 34 percent, and the average diverted-link trip rate is 16 percent. In other words, at a typical shopping center, approximately 50 percent of the traffic entering and exiting the site is already on the surrounding roadway system. A 30 percent pass-by reduction was applied to the retail trip generation for the PM peak hour and a 15 percent pass-by reduction was applied for the Saturday afternoon peak hour. For the restaurant uses, a 40 percent pass-by reduction was applied to the AM, PM, and afternoon peak hour trip generation.

For the residential portion of the project, average ITE trip generation rates for condominiums/townhomes (Land Use Code 230) was selected. The vehicle trip generation rates were then adjusted to account for transit use and non-motorized travel. Based on data from the 2000 Census, 54 percent of Emeryville residents drive alone to work (compared to a Bay Area average of 68 percent), while 20 percent take transit (compared to a Bay Area average of 10 percent), 8 percent bicycle or walk (compared to a Bay Area average of 4 percent), and 6 percent work at home (compared to a Bay Area average of 4 percent). Given the commute characteristics of Emeryville residents and the proximity of the site to transit and pedestrian/bicycle corridors, it is likely that more residents, on average, would travel during peak commute hours via transit or non-motorized modes of travel than is accounted for in standard ITE trip generation rates.

As the existing Marketplace project contains a mix of uses (retail, office, restaurants, and movie theater) it is also likely that some patrons to the site would visit more than one use. With the construction of residential uses adjacent to the site, it is also likely that residents of the site would patronize the commercial portions of the site. A 5 percent reduction factor was selected and applied to the average rates for retail, restaurant and residential uses to account for transit use and internal trips between the restaurant, retail and residential portions of the project. The resulting trip generation rates are presented in Table 5.

TABLE 5
PROJECT TRIP GENERATION RATES

Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Residential Condos/Townhomes	0.07	0.35	0.42	0.33	0.16	0.49	0.24	0.21	0.45
Shopping Center	0.60	0.38	0.98	1.20	1.30	2.50	2.09	1.93	4.02
Restaurant	3.41	3.15	6.56	3.80	2.43	6.23	7.18	4.22	11.40

Source: *Trip Generation*, 7th Edition (ITE) and Fehr & Peers, 2007.

These rates were applied to the size of each project component, as presented in Table 6. At buildout, the project is anticipated to generate a maximum of 281 AM, 459 PM, and 544 Saturday afternoon peak hour trips. The project's maximum trip generation was used to assess project impact to present a conservative "worst-case" analysis of potential project impacts. Due to site limitations, actual development size would likely be less.

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution, summarized in Table 7, was developed based on nearby land uses and demographics, as well as existing turning movement counts at the intersections. The project trip distribution considers non-residential projects for Chiron, Pixar and Sherwin-Williams and the location of complimentary land uses in surrounding jurisdictions. Although census data indicates about 20 percent of Emeryville residents live and work in Emeryville, the distribution assumes workers employed in Emeryville would reside outside of the city, providing a conservative analysis. Project trips were assigned to the roadway network using the trip generation and distribution described and is shown on Figures 6a and 6b for the Existing and 2010 condition and Figures 6c and 6d for the 2030 condition. Project trip distribution for the 2030 condition takes into consideration interchange improvements at the Ashby Avenue/Shellmound Street/I-80 interchange.

TABLE 6
PROJECT TRIP GENERATION

Project Component	Size	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shellmound Building Residential	160 dwelling units	11	56	67	53	26	79	38	34	72
Shellmound Building Retail	55,000 square feet	33	21	54	94	101	195	115	106	221
64th & Christie Residential	180 dwelling units	13	63	76	59	29	88	43	38	81
64th & Christie Retail	6,000 square feet	4	2	6	7	8	15	13	12	25
Retail	5,000 square feet	3	2	5	6	7	13	10	10	20
Restaurant	11,000 square feet	38	35	73	42	27	69	79	46	125
Net New Trips		***102***	***179***	***281***	***261***	***198***	***459***	***298***	***246***	***544***

Source: Fehr & Peers, 2007.

TABLE 7
PROJECT TRIP DISTRIBUTION

Direction	Project Trip Distribution Percentage
Regional Roadways	
State Route 24/State Route 13	16 %
Interstate 880	11 %
Interstate 580	14 %
Interstate 80 West	10 %
Interstate 80 East	19 %
Local Roadways	
North – Via Frontage Road, 7th Street/Hollis Street, San Pablo Avenue	11 %
East – Via Ashby Avenue, Alcatraz Avenue, Stanford Avenue, 40th Street	12 %
South – Via Mandela Parkway, Peralta Street, Adeline Street, San Pablo Avenue	7 %
Total	***100 %***

Source: *Fehr & Peers, 2007.*

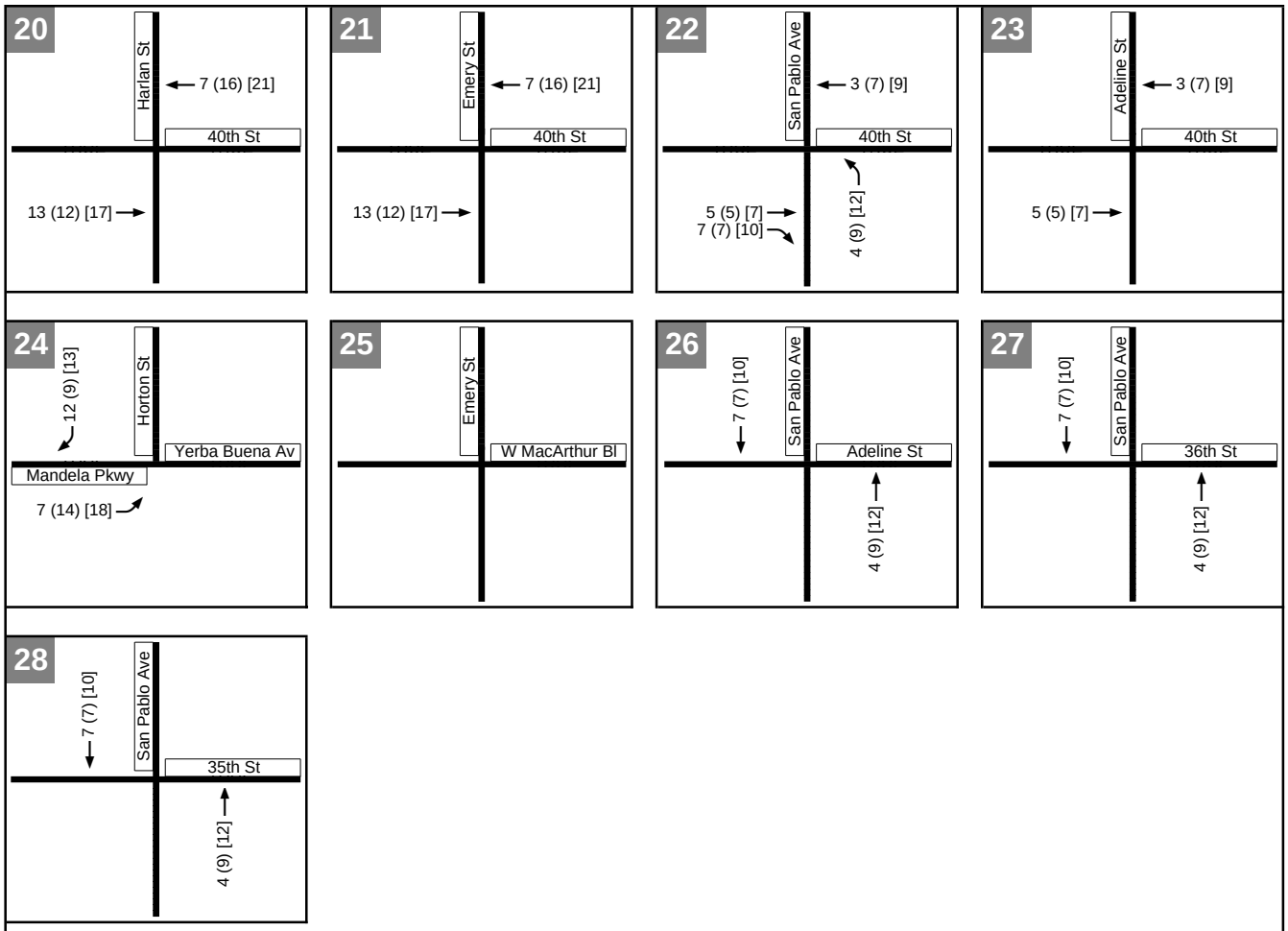
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING AND 2010 CONDITIONS PEAK HOUR PROJECT TRIP ASSIGNMENT

May 2007
Graphics\April07 PDFs\WC05-2272_6A

FIGURE 6A



KEY:

XX (YY) = AM (PM) [SAT] Peak Hour Traffic Volumes

Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

EXISTING AND 2010 CONDITIONS PEAK HOUR PROJECT TRIP ASSIGNMENT

May 2007
Graphics\April07 PDFs\WC05-2272_6B

FIGURE 6B

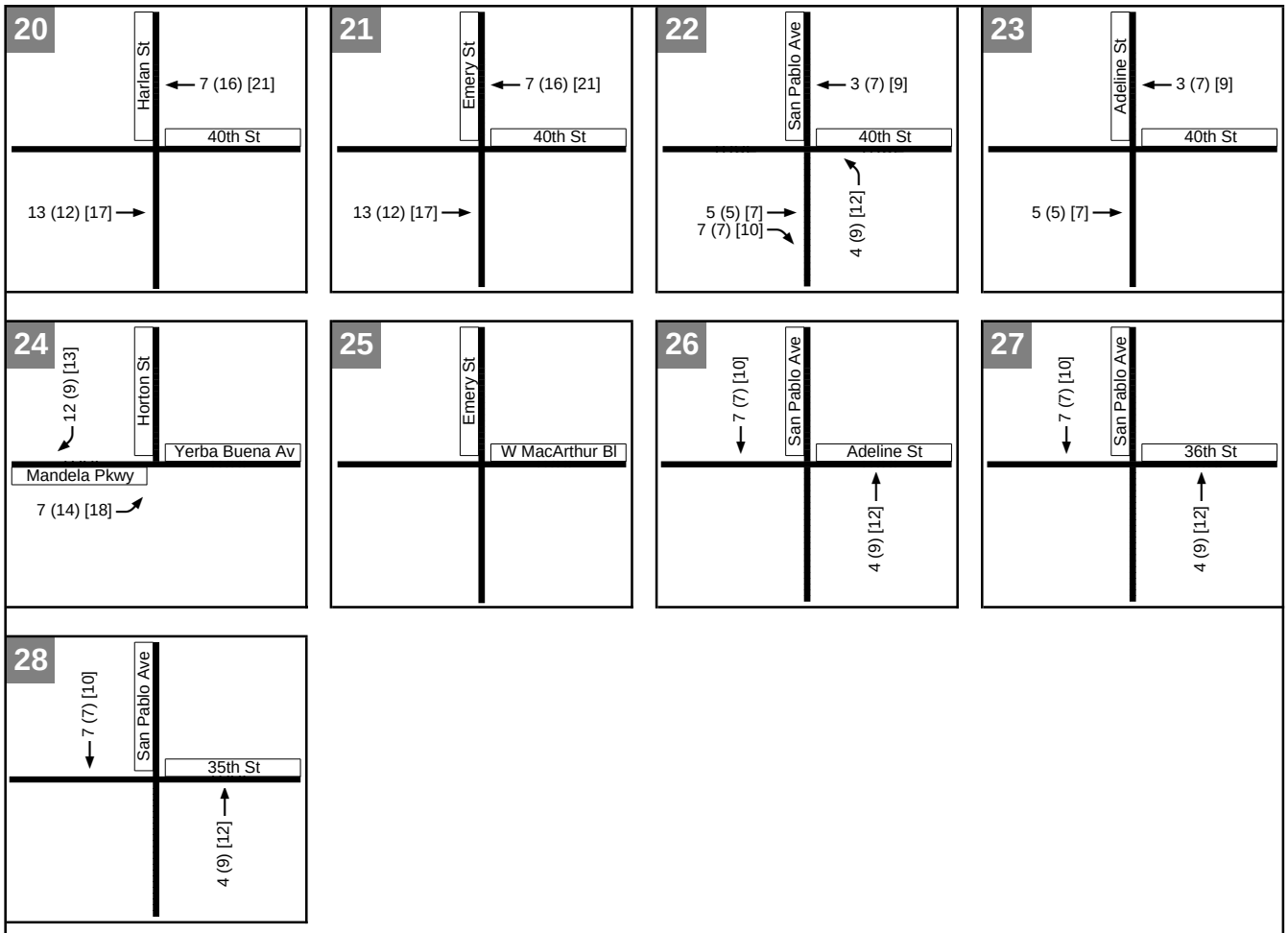
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

2030 CONDITIONS
PEAK HOUR PROJECT TRIP ASSIGNMENT

May 2007
Graphics\April07 PDFs\WC05-2272_6C

FIGURE 6C



KEY:

XX (YY) = AM (PM) [SAT] Peak Hour Traffic Volumes

Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

2030 CONDITIONS PEAK HOUR PROJECT TRIP ASSIGNMENT

May 2007
Graphics\April07 PDFs\WC05-2272_6D

FIGURE 6D

4. FUTURE 2010 AND 2030 CONDITIONS

This chapter describes the methods used to develop 2010 and 2030 traffic volumes and future intersection operating conditions.

TRAFFIC FORECASTS

To forecast Future 2010 and 2030 without project traffic volumes, peak hour trips from potential developments and estimates of trips traveling through the City of Emeryville were assigned to the roadway network and added to existing peak hour traffic volumes. Trips traveling through the City (without a destination in the City of Emeryville) were obtained from the Alameda County Congestion Management Agency (ACCMA) travel demand forecasting model.

A list of all City of Emeryville approved, planned and potential developments was provided by city staff. The development levels on this list, found in Appendix D, are consistent with land use data provided to the Alameda County CMA from local jurisdictions for its use in regional planning and is currently being used to update the City of Emeryville traffic impact fee program. The list was divided into developments with expected completion dates prior to 2010 and those with expected completion dates between 2010 and 2030. Trips generated by developments with expected completion dates prior to 2010 were included in Future 2010 traffic volumes. Future 2010 peak hour traffic volumes are shown on Figure 7 for the weekday peak hours and Figure 8 for the Saturday peak hour. Future 2030 volumes include trips generated by all developments expected to be completed by 2030. Future 2030 peak hour traffic volumes without the project are shown on Figure 9 for the weekday peak hours and Figure 10 for the Saturday peak hour.

FUTURE ROADWAY IMPROVEMENTS

The analysis of future (2010 and 2030) conditions considers the new MacArthur on-ramp to I-580, which was recently opened. This connection was not considered in the analysis of existing conditions as it was not in place at the time traffic counts were collected. Existing traffic that might be expected to use the ramp was shifted from other interchanges in the area, such as the Powell Street interchange. Added traffic from new developments in the City was also assigned to the new roadway connection.

The analysis of future (2010 and 2030) conditions considers the signalization of the 65th Street/Shellmound Street and 65th Street/Overland Avenue intersection along with a redistribution of existing traffic from the Hollis Street to Overland Avenue corridor. These signals and roadway extension were not operational at the time traffic count data was collected.

Improvements to the Ashby Avenue/Shellmound Street/I-80 interchange were assumed to be in place for the analysis of 2030 conditions, as it is reasonably foreseeable that this improvement would be in place by 2030. Planned improvements would increase interchange capacity and provide a direct connection to/from Shellmound Street to I-80. Traffic volumes were adjusted to reflect the potential travel changes as capacity is increased at the Ashby interchange and congestion increases at the Powell Street interchange.

FUTURE 2010 INTERSECTION OPERATING CONDITIONS

Intersection operating conditions in 2010 were analyzed using the traffic forecasts described above and the lane configurations and traffic control shown on Figure 11. As shown on Table 8, seven intersections are projected to operate at unacceptable service levels (i.e. LOS E or F) during at least one peak hour:

- Ashby Avenue/San Pablo Avenue (PM Peak Hour)
- I-80 EB Ramps/Powell Street (PM and Saturday Peak Hour)
- Christie Avenue/Powell Street (PM and Saturday Peak Hour)
- Powell Street/Hollis Street (PM Peak Hour)
- Stanford Avenue/San Pablo Avenue (PM Peak Hour)
- 40th Street/San Pablo Avenue (PM Peak Hour)
- 36th Street/San Pablo Avenue (PM Peak Hour)

The remaining study intersections are projected to operate at acceptable service levels in 2010.

Vehicle queues were calculated at the key study intersections within the Christie/Powell Loop. Locations where the 95th percentile vehicle queue is expected to exceed the available storage length for a turning movement and where the through movement is expected to spill back through the adjacent intersection and impede roadway network operations is shown on Table 9. AM peak hour vehicle queue congestion is limited to the eastbound traffic flow on Powell Street approaching Christie Avenue. This congestion occurs because of the incoming commute traffic to Emeryville employment centers. The amount of queue congestion increases during the PM peak hour, especially at the Powell Street/Christie Avenue intersection where queue congestion will occur on all but the northbound approach to the intersection. The I-80 eastbound off-ramp at Powell Street will also experience substantial vehicle queues as drivers use the off-ramp in an effort to bypass freeway traffic congestion. Vehicle queues during the Saturday peak hour will generally occur at the same intersection approaches as during the PM peak hour with additional queue congestion occurring on Shellmound Way between Christie Avenue and Shellmound Street.

Railroad Preemption

Although the 65th Street/Shellmound Street and 65th Street/Overland Street intersection is projected to operate at an acceptable level in 2010, the intersection will operate deficiently when a train is present, as vehicle queues could impeded north/south travel on Shellmound Street. Up to 55 trains per day travel over 65th Street at Shellmound Avenue based on information provided by the Federal Railroad Administration (http://safetydata.fra.dot.gov/officeofsafety/). To reduce the effects of vehicle queuing when trains travel over 65th Street, improvements to increase the length of the northbound right-turn lane and southbound left-turn lane should be considered by the City as adjacent properties redevelop. These improvements would permit vehicles to queue in the turn lane as opposed to the travel lane on Shellmound Street.

FUTURE 2030 INTERSECTION OPERATING CONDITIONS

Peak hour intersection operating conditions in 2030 were analyzed using the traffic forecasts described above and the lane configurations and traffic control shown on Figure 11. As shown on Table 10, 16 study intersections are projected to operate at deficient service levels during at least one peak hour by 2030.

- Ashby Avenue/7th Street (PM Peak Hour)

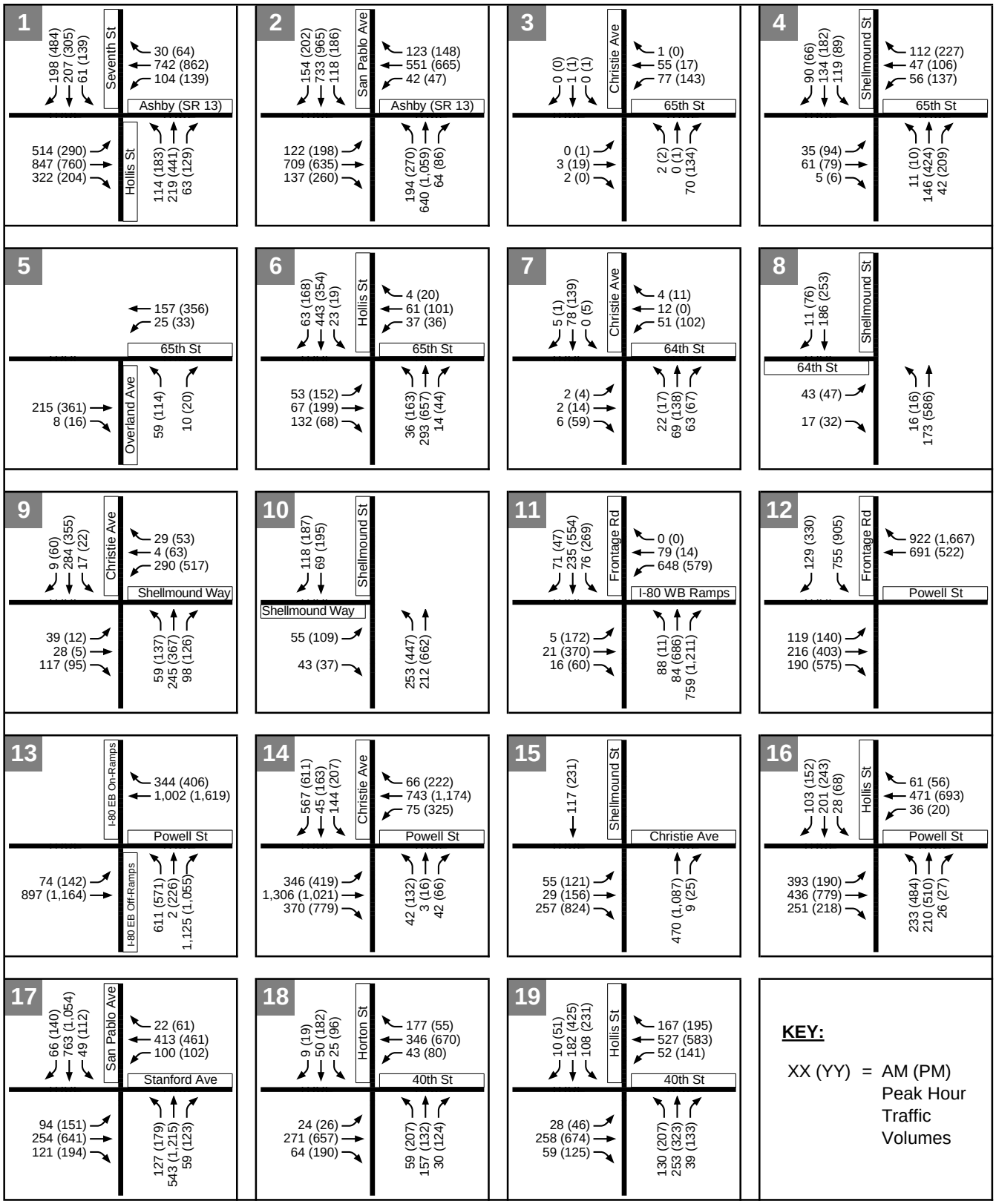
- Ashby Avenue/San Pablo Avenue (PM Peak Hour)
- 65th Street/Shellmound Street and 65th Street/Overland Street (PM Peak Hour)
- I-80 EB Ramps/Powell Street (PM and Saturday Peak Hour)
- Christie Avenue/Powell Street (AM, PM and Saturday Peak Hour)
- Powell Street/Hollis Street (PM Peak Hour)
- Stanford Avenue/San Pablo Avenue (PM Peak Hour)
- 40th Street/Horton Street (PM Peak Hour)
- 40th Street/Hollis Street (PM Peak Hour)
- 40th Street/Harlan Street (PM Peak Hour)
- 40th Street/Emery Street (PM Peak Hour)
- 40th Street/San Pablo Avenue (PM and Saturday Peak Hour)
- Mandela Parkway/Horton Street (PM Peak Hour)
- MacArthur Street/Emery Street (PM Peak Hour)
- 36th Street/San Pablo Avenue (PM Peak Hour)
- 35th Street/San Pablo Avenue (PM Peak Hour)

The remaining study intersections are projected to operate at acceptable service levels in 2030.

Locations where the 95th percentile vehicle queue is expected to exceed the available storage length for a turning movement and where the through movement is expected to spill back through the adjacent intersection and impede roadway network operations is shown on Table 11. The level and type of vehicle queues expected in year 2010 would continue in 2030 with some minor differences associated with the redistribution of traffic from the Powell interchange to the reconstructed Ashby interchange.

Railroad Preemption

The 65th Street/Shellmound Street and 65th Street/Overland Street intersection is projected to operate at LOS F during the PM peak hour in 2030. The LOS F conditions would worsen when a train travels over 65th Street. Deficient operations would also occur when trains are present during the other times of day.



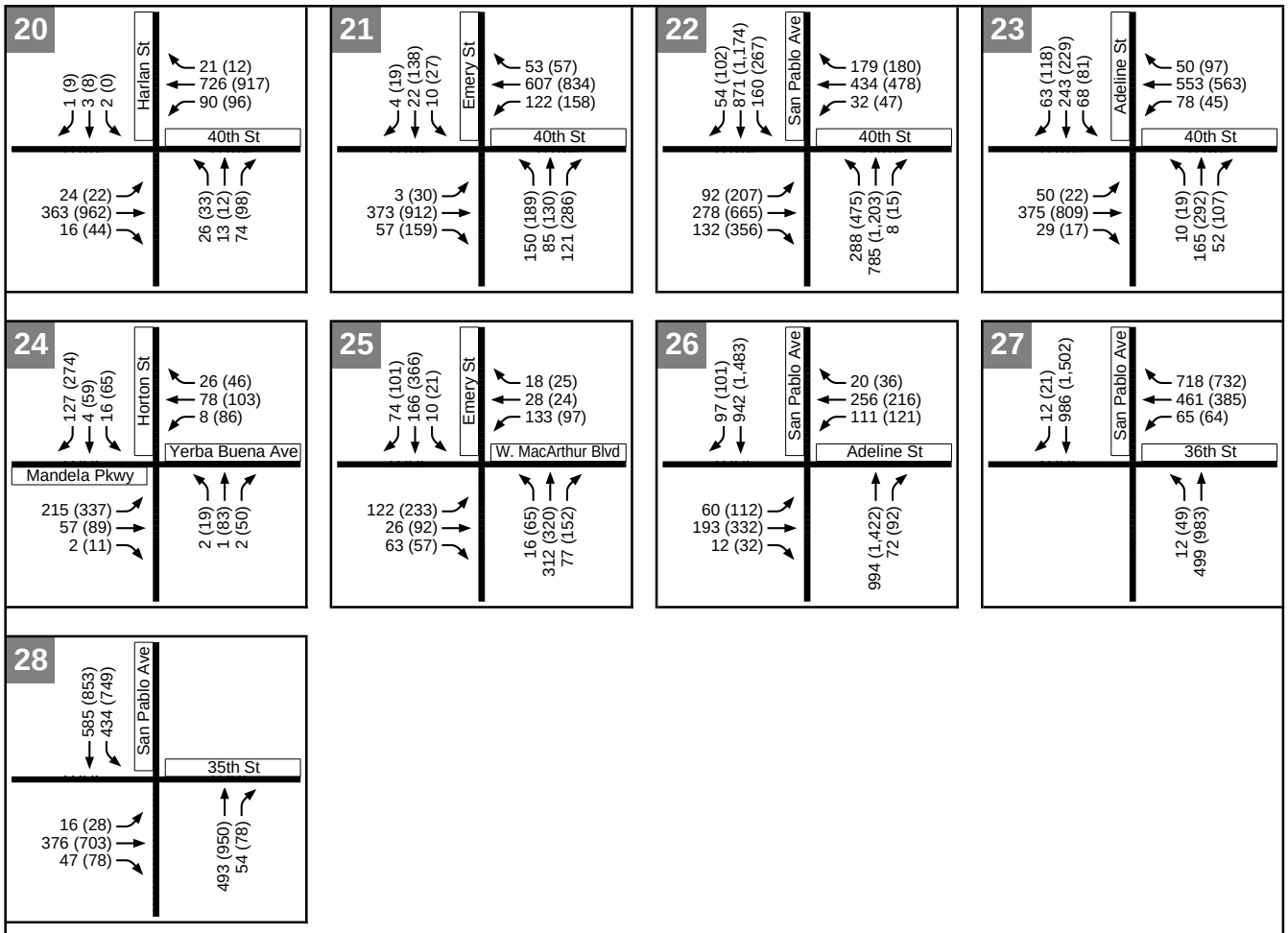
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

FUTURE 2010 WITHOUT PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

February 2007
Graphics\Feb07 PDFs\WC05-2272_7A

FIGURE 7A



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

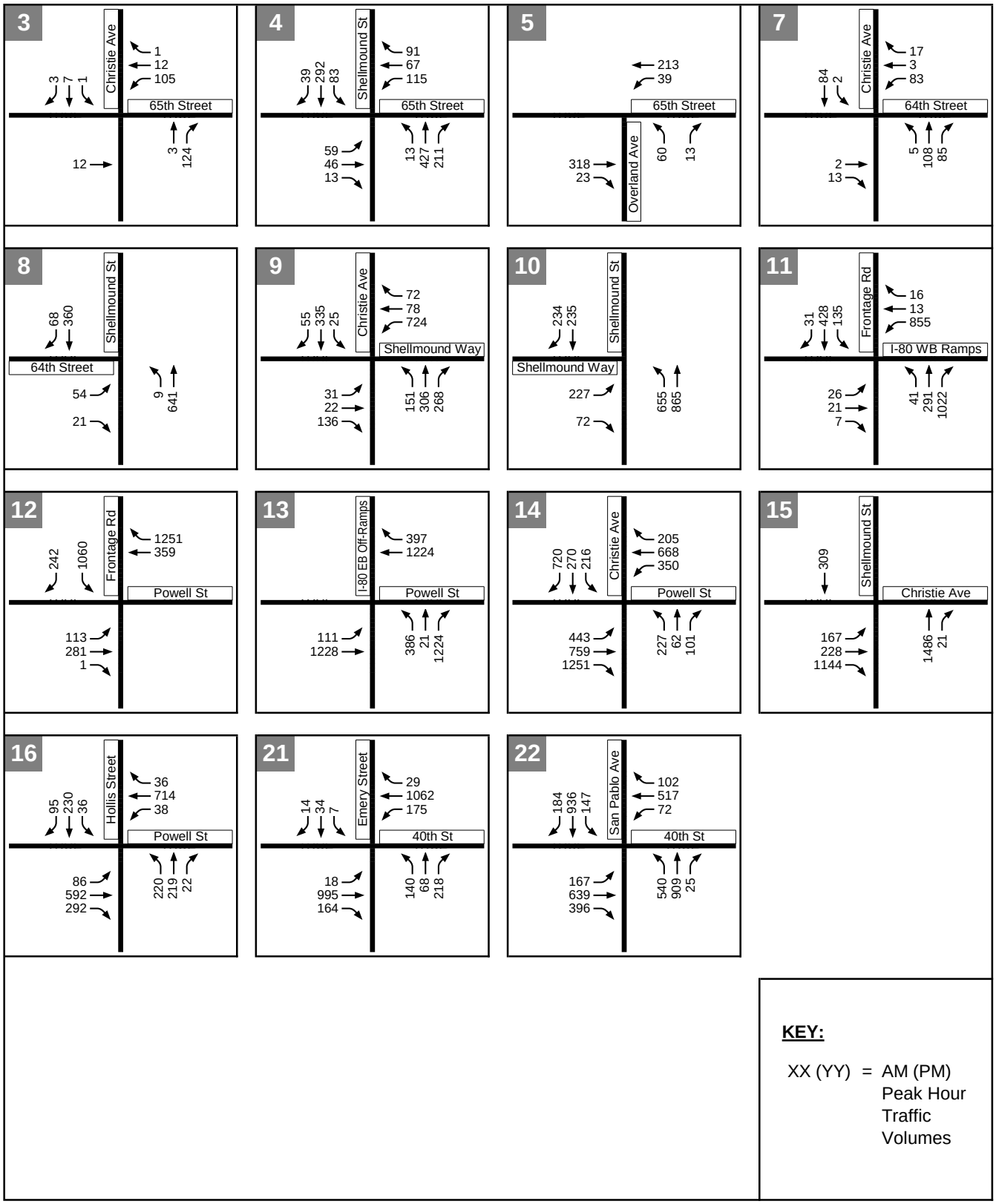
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

FUTURE 2010 WITHOUT PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

February 2007
Graphics\Feb07 PDFs\WC05-2272_7B

FIGURE 7B



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

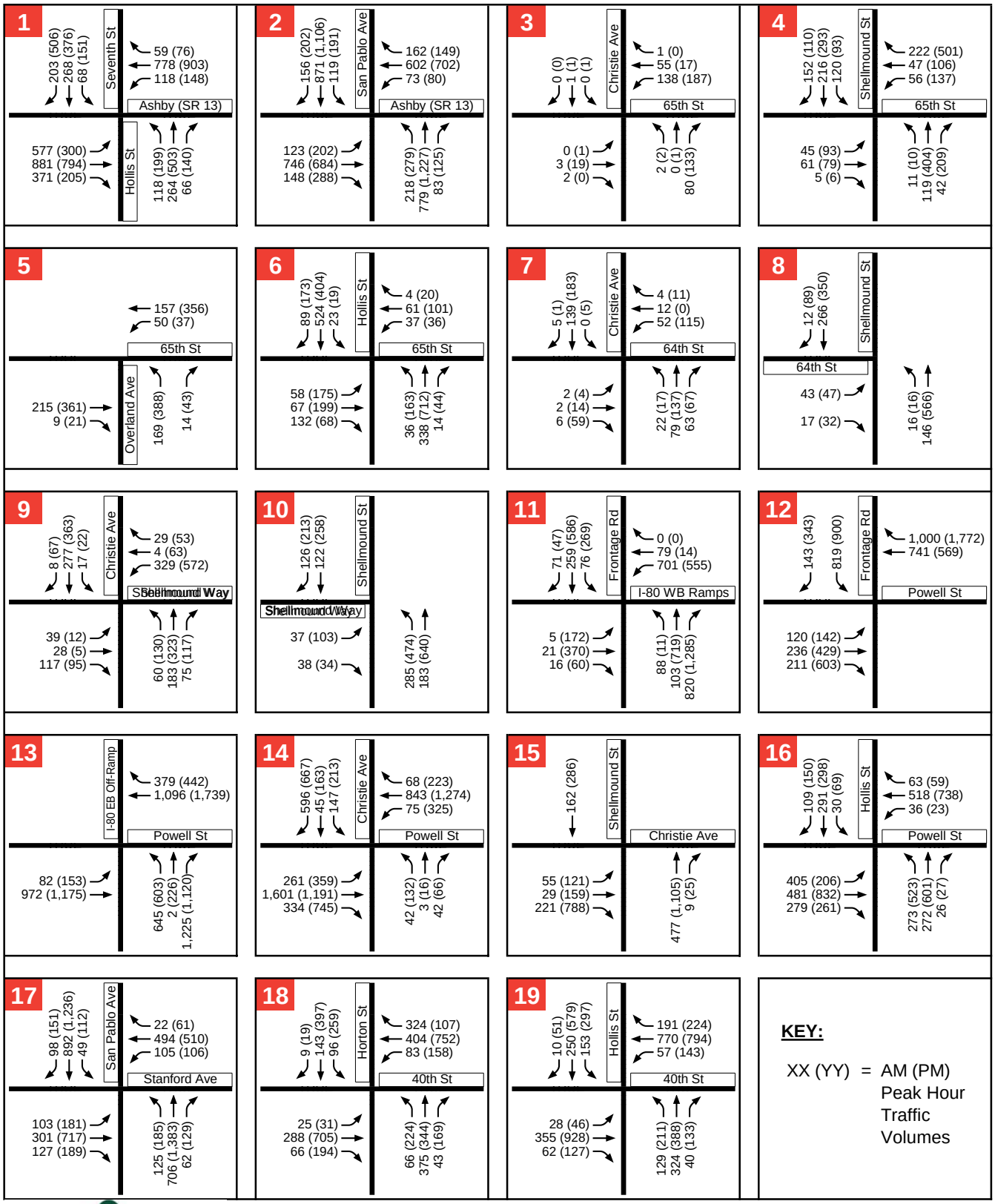
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

FUTURE 2010 SATURDAY PEAK HOUR TRAFFIC VOLUMES

February 2007
Graphics\Feb07 PDFs\WC05-2272_8

FIGURE 8



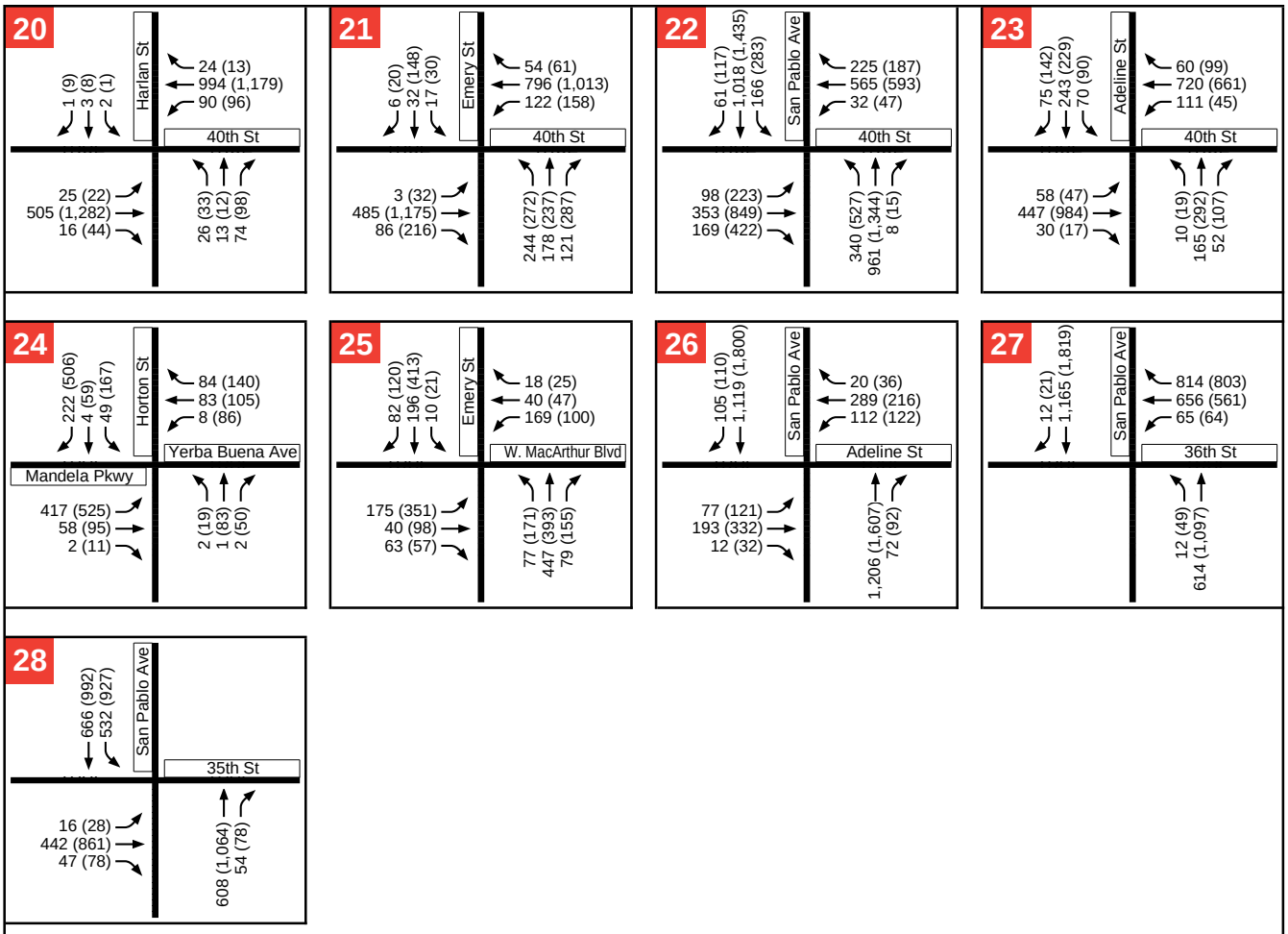
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_9A

Marketplace Redevelopment

FUTURE 2030 WITHOUT PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 9A



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

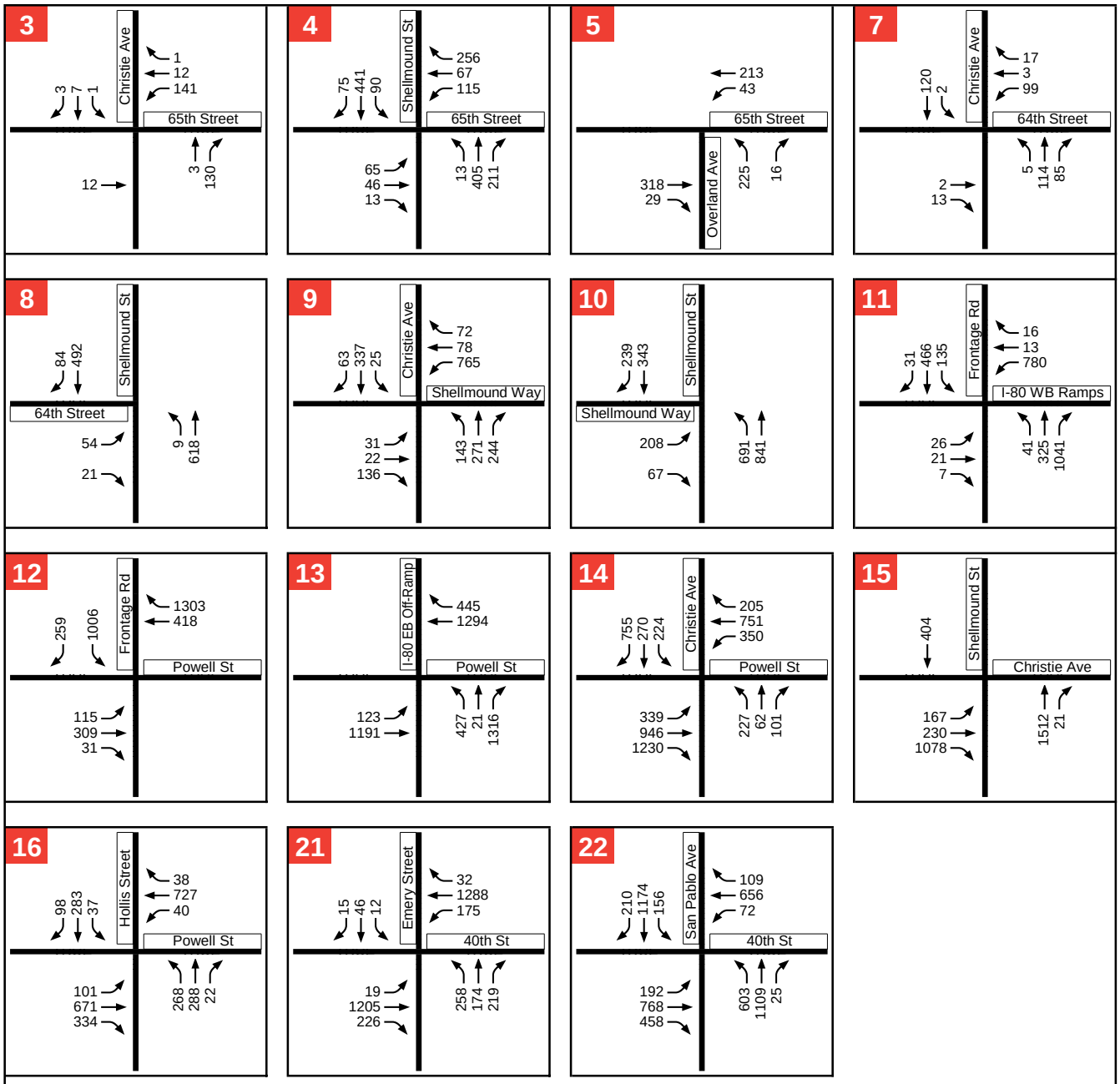
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_9B

Marketplace Redevelopment

FUTURE 2030 WITHOUT PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 9B



KEY:

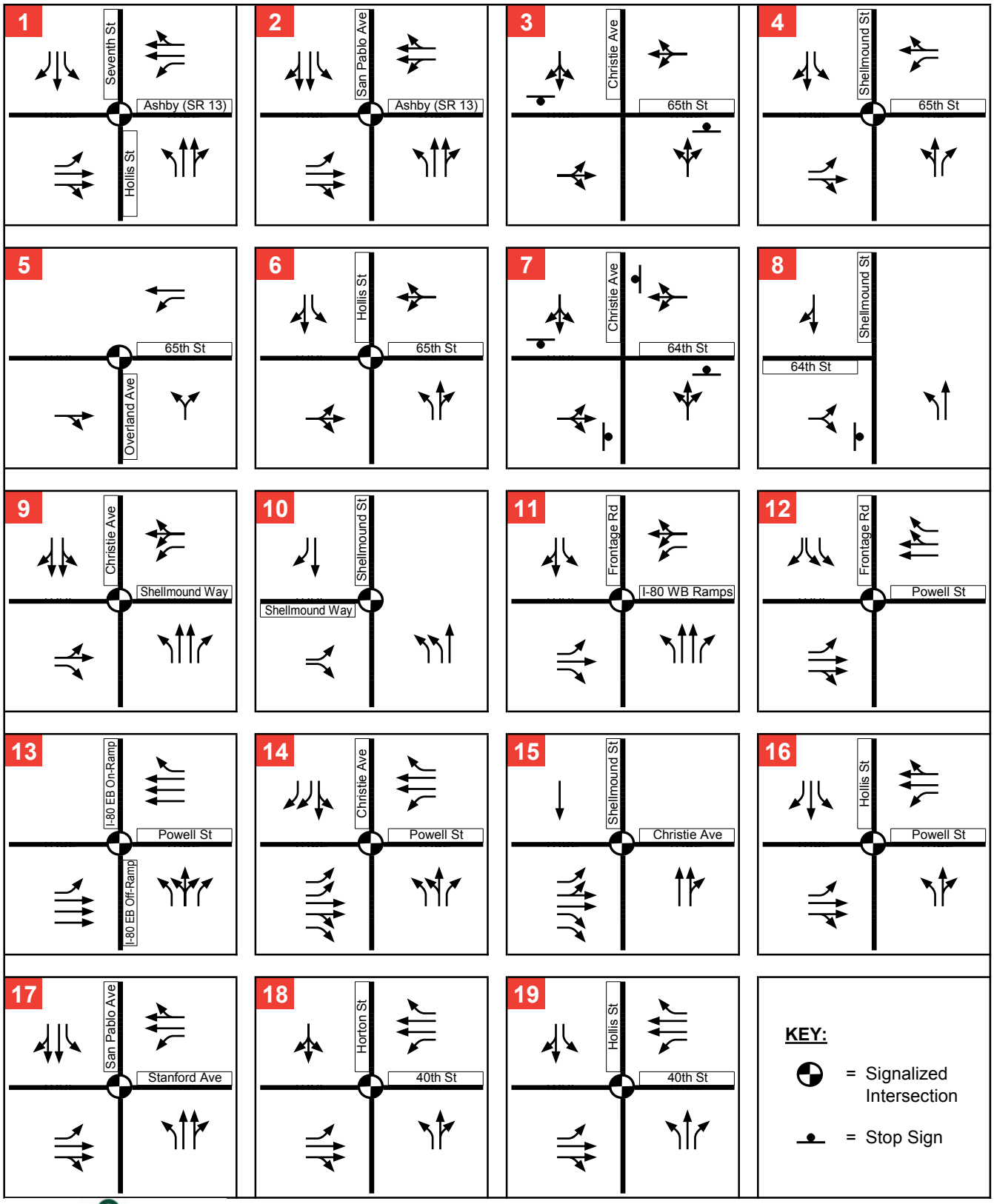
XX = SAT Peak Hour Traffic Volumes

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_10

Marketplace Redevelopment

FUTURE 2030
SATURDAY PEAK HOUR TRAFFIC VOUMES
FIGURE 10



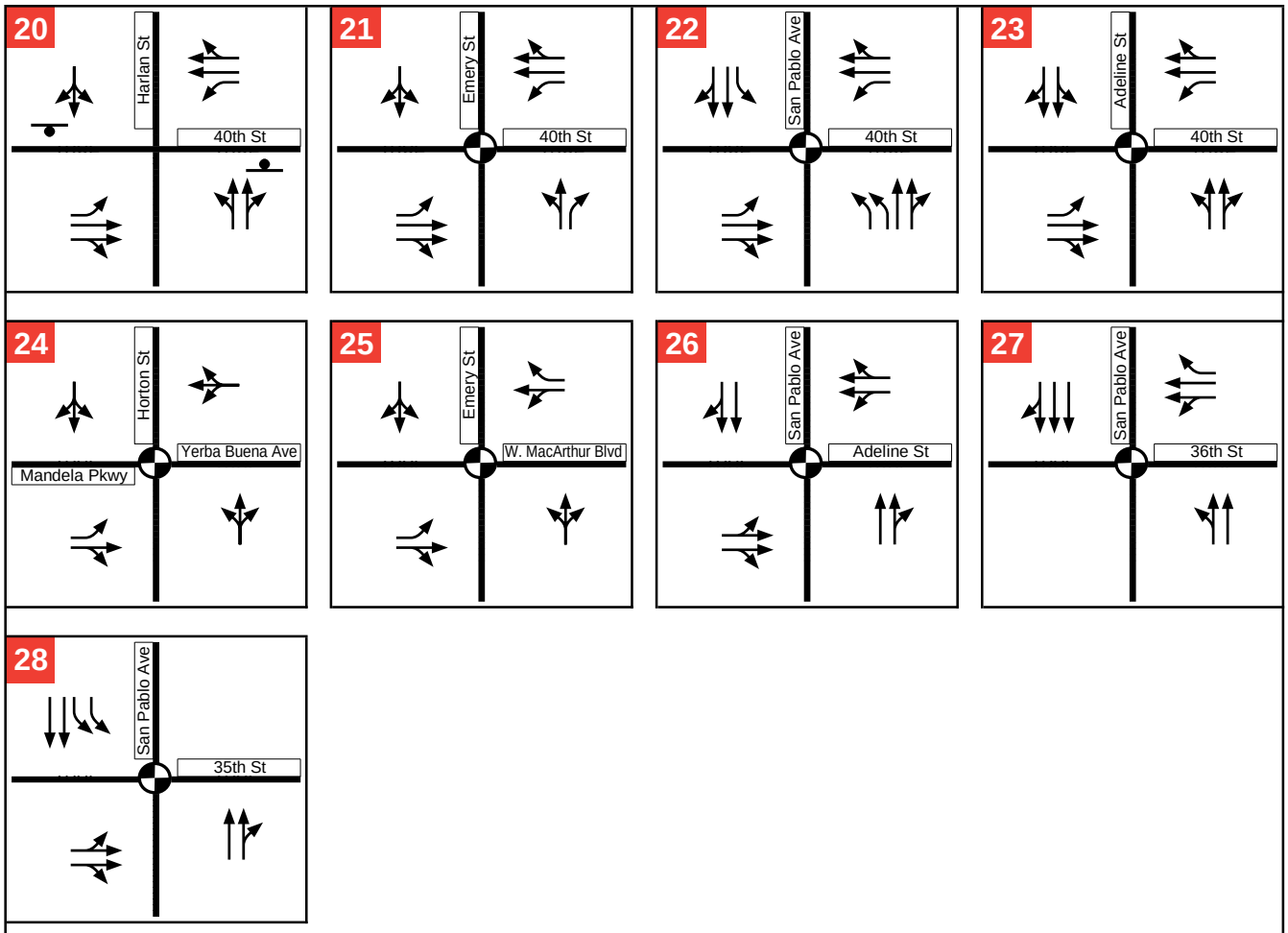
Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL

FIGURE 11A

February 2007
Graphics\Feb07 PDFs\WC05-2272_11A



Marketplace Redevelopment

FEHR & PEERS
TRANSPORTATION CONSULTANTS

FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL

FIGURE 11B

February 2007
Graphics\Feb07 PDFs\WC05-2272_11B

TABLE 8
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	46 50	D D
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	32 81	C F
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street[3]	Signal	AM PM SAT	25 46 32	C D C
5. 65th Street/Overland Avenue[3]	Signal			
6. 65th Street/Hollis Street	Signal	AM PM	15 32	B C
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 8	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	2 (11) 2 (17) 2 (26)	A (B) A (C) A (D)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	30 19 25	C B C
10. Shellmound Way/Shellmound Street	Signal	AM PM SAT	30 25 20	C C B
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	15 42 19	B D B
12. Powell Street/Frontage Road	Signal	AM PM SAT	18 20 23	B C C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM PM SAT	28 101 93	C F F
14. Powell Street/Christie Avenue	Signal	AM PM SAT	33 86 108	C F F
15. Christie Avenue/Shellmound Street	Signal	AM PM SAT	12 24 24	B C C
16. Powell Street/Hollis Street	Signal	AM PM SAT	37 80 28	D E C

TABLE 8
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS

17. Stanford Avenue/San Pablo Avenue	Signal	AM PM	31 69	C E
18. 40th Street/Horton Street	Signal	AM PM	23 34	C C
19. 40th Street/Hollis Street	Signal	AM PM	28 50	C D
20. 40th Street/Harlan Street	SSSC	AM PM	2 (36) 9 (125)	A (E) A (F)
21. 40th Street/Emery Street	Signal	AM PM SAT	23 36 24	C D C
22. 40th Street/San Pablo Avenue	Signal	AM PM SAT	36 72 70	D E E
23. 40th Street/Adeline Street	Signal	AM PM	15 15	B B
24. Mandela Pkwy/Horton Street	AWSC	AM PM	9 22	A C
25. MacArthur Boulevard/Emery Street	Signal	AM PM	15 18	B B
26. Adeline Street/San Pablo Avenue	Signal	AM PM	22 36	C D
27. 36th Street/San Pablo Avenue	Signal	AM PM	28 59	C E
28. 35th Street/San Pablo Avenue	Signal	AM PM	18 38	B D

1. SSSC = side-street stop-controlled intersection; AWSC = all-way stop-controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop-controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop-controlled intersections.
3. The intersections of 65th Street/Shellmound Street and 65th Street/Overland Avenue were analyzed as an interconnected signal system due to the railroad crossing. Intersection operations will be LOS F when a train crosses through the intersection.

Source: Fehr & Peers, 2007.

TABLE 9
FUTURE 2010 VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	95th Percentile Queue Length (in feet) [1]		
			AM	PM	Saturday
Shellmound Way/ Christie Avenue	Northbound	235	25	100	50
	Southbound	--	75	175	200
	Westbound	335	225	100	525
Shellmound Way/ Shellmound Street	Northbound left	400	75	175	225
	Southbound right	200	50	100	100
	Southbound through	--	50	150	225
	Eastbound	335	75	75	250
Powell Street/I-80 Eastbound Ramps	Northbound left	900	550	725	350
	Northbound through	900	650	1025	600
	Northbound right	900	600	975	1,100
	Westbound through	400	150	350	400
	Westbound right	400	25	50	125
	Eastbound left	275	50	150	125
	Eastbound through	275	150	100	525
Powell Street/ Christie Avenue	Northbound left	200	50	125	250
	Northbound through	200	50	125	250
	Northbound right	200	50	75	75
	Southbound Through	235	175	425	600
	Southbound Right	235	75	100	125
	Westbound left	200	125	500	550
	Westbound through	--	325	700	325
	Westbound right	50	75	225	150
	Eastbound left	400	150	175	175
	Eastbound through	450	675	500	675
	Eastbound Right	450	25	450	450

Notes:
1. 95th percentile vehicle queue in feet as calculated by Synchro 6.0.

Source: Fehr & Peers, 2007.

TABLE 10
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	59 63	E E
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	40 128	D F
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (12) 8 (14) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street[3]	Signal	AM PM SAT	31 96 43	C F C
5. 65th Street/Overland Avenue[3]	Signal			
6. 65th Street/Hollis Street	Signal	AM PM	15 40	B D
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 9	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	2 (12) 2 (20) 2 (46)	A (B) A (C) A (E)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	34 19 28	C B C
10. Shellmound Way/Shellmound Street	Signal	AM PM SAT	29 24 20	C C B
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	16 42 20	B D B
12. Powell Street/Frontage Road	Signal	AM PM SAT	18 21 22	B C C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM PM SAT	37 102 101	D F F
14. Powell Street/Christie Avenue	Signal	AM PM SAT	56 90 136	E F F
15. Christie Avenue/Shellmound Street	Signal	AM PM SAT	12 22 23	B C C
16. Powell Street/Hollis Street	Signal	AM PM SAT	51 114 45	D F D

TABLE 10
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS

17. Stanford Avenue/San Pablo Avenue	Signal	AM PM	32 119	C F
18. 40th Street/Horton Street	Signal	AM PM	37 127	D F
19. 40th Street/Hollis Street	Signal	AM PM	35 82	D F
20. 40th Street/Harlan Street	SSSC	AM PM	3 (68) >100 (>100)	A (F) F (F)
21. 40th Street/Emery Street	Signal	AM PM SAT	29 104 81	C F F
22. 40th Street/San Pablo Avenue	Signal	AM PM SAT	45 142 130	D F F
23. 40th Street/Adeline Street	Signal	AM PM	15 16	B B
24. Mandela Pkwy/Horton Street	AWSC	AM PM	11 71	B E
25. MacArthur Boulevard/Emery Street	Signal	AM PM	21 86	C F
26. Adeline Street/San Pablo Avenue	Signal	AM PM	24 48	C D
27. 36th Street/San Pablo Avenue	Signal	AM PM	47 74	D E
28. 35th Street/San Pablo Avenue	Signal	AM PM	21 61	C E

1. SSSC = side-street stop-controlled intersection; AWSC = all-way stop-controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop-controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop-controlled intersections.
3. The intersections of 65th Street/Shellmound Street and 65th Street/Overland Avenue were analyzed as an interconnected signal system due to the railroad crossing. Intersection operations will be LOS F when a train crosses through the intersection.

Source: Fehr & Peers, 2007.

TABLE 11
FUTURE 2030 VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	95th Percentile Queue Length (in feet) [1]		
			AM	PM	Saturday
Shellmound Way/ Christie Avenue	Northbound	235	25	75	75
	Southbound	--	75	175	200
	Westbound	335	250	100	575
Shellmound Way/ Shellmound Street	Northbound left	400	100	125	225
	Southbound right	200	75	150	125
	Southbound through	--	75	200	325
	Eastbound	335	50	75	250
Powell Street/I-80 Eastbound Ramps	Northbound left	900	600	750	400
	Northbound through	900	750	1,000	675
	Northbound right	900	675	975	1,250
	Westbound through	400	175	400	450
	Westbound right	400	25	50	125
	Eastbound left	275	50	150	110
	Eastbound through	275	150	125	475
Powell Street/ Christie Avenue	Northbound left	200	50	125	250
	Northbound through	200	50	125	250
	Northbound right	200	50	75	75
	Southbound Through	235	150	375	600
	Southbound Right	235	75	150	150
	Westbound left	200	100	475	550
	Westbound through	--	400	750	350
	Westbound right	50	75	225	175
	Eastbound left	400	100	150	125
	Eastbound through	450	775	550	800
	Eastbound Right	450	25	425	700

Notes:
1. 95th percentile vehicle queue in feet as calculated by Synchro 6.0.

Source: Fehr & Peers, 2007.

5. OFF-SITE IMPACTS AND MITIGATION MEASURES

This chapter describes off-site traffic impacts and associated mitigation measures under Existing, 2010 and 2030 with Project conditions. Operations at the project driveways and on-site circulation are discussed in Chapter 8.

PROJECT IMPACTS

Existing Plus Project

The peak hour project traffic volumes were added to the existing traffic volumes to determine the Existing Plus Project traffic volumes, as shown on Figure 12 for the weekday peak hours and Figure 13 for the Saturday peak hour. The Existing Plus Project analysis results are shown on Table 12. The addition of project traffic would increase delay by more than four seconds at two intersections which operate at a deficient LOS E prior to the addition of project traffic.

- Shellmound Street/65th Street (weekday PM peak hour, Saturday afternoon peak hour)
- Powell Street/I-80 Eastbound Ramps (weekday PM peak hour)

Vehicle queues at the study intersections within the Powell/Christie Loop were calculated with the addition of project traffic, as shown on Table 13. The addition of project traffic would increase the 95th percentile vehicle queue at two intersections where the existing 95th percentile vehicle queue currently exceeds the available storage:

- Powell Street/I-80 Eastbound Ramps
- Powell Street/Christie Avenue

Increasing vehicle queue spillback is a potentially significant impact as vehicles queued outside of turn-pockets can impede other movements at the intersection, lead to poor lane utilization, and degrade the operation of the intersection, as well as the roadway system. These are potentially significant impacts.

Future 2010

The peak hour project traffic volumes were added to the 2010 Without Project (Figure 7) volumes to determine Future 2010 traffic volumes with the project, as shown on Figure 14 for the weekday peak hours and Figure 15 for the Saturday peak hour. The 2010 conditions analysis results are shown in Table 14. The project would increase delay by more than 4 seconds at one intersection projected to operate at a deficient LOS E or F prior to the addition of project traffic.

- Powell Street/I-80 Eastbound Ramps (weekday PM peak hour, Saturday afternoon peak hour)

Vehicle queues at the study intersections within the Powell/Christie Loop were also calculated with the addition of project traffic, as shown on Table 15. The addition of project traffic would increase the 95th percentile vehicle queue at the four intersections within the Loop where the existing 95th percentile vehicle queue currently exceeds the available storage. These are potentially significant impacts.

Future 2030

The peak hour project traffic volumes (Figure 5) were added to the 2030 Without Project (Figure 8) volumes to determine Future 2030 traffic volumes with the project, as shown on Figure 16 for the weekday peak hours and Figure 17 for the Saturday peak hour. The 2030 conditions analysis results are shown in Table 16. The project would increase delay by more that 4 seconds at three intersections projected to operate at a deficient LOS E or F prior to the addition of project traffic.

- Ashby Avenue/San Pablo Avenue (weekday PM peak hour)
- 65th Street/Shellmound Street and 65th Street/Overland Street (weekday PM Peak Hour)
- Powell Street/I-80 Eastbound Ramps (weekday PM peak hour, Saturday afternoon peak hour)
- Powell Street/Hollis Street (weekday PM peak hour)

Vehicle queues at the study intersections within the Powell/Christie Loop were calculated with the addition of project traffic, as shown on Table 17. The addition of project traffic would increase the 95th percentile vehicle queue at the critical intersections in the Powell/Christie loop where the projected 95th percentile vehicle queue exceeds the available storage. These are potentially significant impacts.

MITIGATION MEASURES

The projects contribution to impacted intersections is presented in Table 18.

Existing Plus Project

Impact Statement 1: The ***I-80 EB Ramps/Powell Street*** intersection currently operates at LOS E during the PM peak hour and Saturday peak hour. The addition of project traffic would worsen the service level to LOS F during the PM peak hour and increase delay by 10 seconds. On Saturday, the addition of project traffic would increase delay by 8 seconds. The addition of project traffic would also increase the 95th percentile queue lengths for several approaches that currently exceed or are projected to exceed the available storage capacity during the weekday PM and Saturday afternoon peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 1a: Modify the intersection to:

a. Reconstruct the off-ramp to provide dual left-turn and dual right-turn lanes. The additional lane should be 600 to 900 feet, depending on design parameters stipulated by Caltrans.

b. Reconstruct the southeast corner of the Powell Street/I-80 Eastbound Ramps intersection improving the curb radii to 40 feet.

c. Widen the north side of Powell Street 12 to 14 feet between Christie Avenue and Eastbound I-80 Ramps to align westbound Powell Street through lanes across the intersection with Eastbound I-80 Ramps. This improvement will also allow the widening of the eastbound right-turn lane at the Powell Street/Christie Avenue intersection to 14 feet and construction of a pedestrian median refuge on the west side of the Powell Street/Christie Avenue intersection. This change requires

right-of-way along the north side of Powell Street between Christie Avenue and the I-80 Eastbound On-Ramp.

This recommendation should be implemented with Mitigation Measure 3 to provide corridor benefits.

This impact also occurs in the 2010 and 2030 scenarios and can be attributed to existing traffic in the area, as well as traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include this recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees. Additionally, it should be noted that right-of-way for this improvement is reliant on the redevelopment of the adjacent parcels and the improvements can be phased to provide interim benefit as right-of-way becomes available.

The Project impact would be reduced to a ***less-than-significant*** level. However, as the intersection is within the Caltrans right-of-way and the City cannot assure the implementation of this measure, the impact may remain ***significant and unavoidable***.

Impact Statement 1b: Many elements of the project would help minimize the number of vehicle trips that could result from the proposed project and minimize the project's adverse impact on intersection operations. The project proposes to construct a mixture of uses, within a mixed use environment. Class II bicycle lanes are provided adjacent to the project site, with bicycle parking proposed. A minimum of ten foot side walks and marked pedestrian crossings would be provided as part of the project. The site is well served by transit. Shared parking between residential guest parking and retail parking is proposed to minimize the total parking supply. Implementation of a formal Transportation Demand Management Plan (TDM) could further minimize the project's impacts on traffic and circulation.

Mitigation Measure 1b: Implementation of the following mitigation measure would minimize the project's impacts on intersection operation; however as it is difficult to quantify the effects of TDM measures implementation of this measure alone would not reduce project impacts to a less-than-significant level.

The project applicant shall prepare and implement a comprehensive transportation demand management (TDM) program that includes the following elements to encourage and enhance alternate modes of travel:

- Transit amenities, including bus pull-outs, transit information and ticket kiosks, and discounted transit passes for employees and residents.
- Carpool/vanpool support, including preferential parking spaces and ride-matching programs.
- Carshare support, including free parking spaces, on-site information and advertising, and discounted rates/long-term contracts.
- Bicycle amenities, including bicycle parking racks, pilot bicycle rental program, new bicycle paths, and shower/locker facilities.

In addition, the TDM plan should discourage automobile use by incorporating the following elements:

- Residential parking spaces should be unbundled from the units.
- All non-residential parking should be paid parking.
- Monthly parking permits should not be provided for employees.

Provision of car sharing facilities on-site could help reduce auto ownership amongst future residents/tenants of the building and encourage alternative modes for trips generated by the site. The TDM program shall be submitted to City staff for review and acceptance prior to approval of any Final Development Plans.

Impact Statement 2: The ***Shellmound Street/65th Street*** intersection currently operates at LOS E during the PM peak hour. With the addition of project traffic, the intersection would degrade to LOS F, resulting in a ***significant*** impact. However, a traffic signal was recently installed at this intersection, resulting in LOS B operations during the PM and Saturday peak hours with the addition of the project traffic. Therefore, as a traffic signal has been installed at this location, the project impact is ***less-than-significant***.

Mitigation Measure 2: No improvements are recommended.

Impact Statement 3: The ***Powell Street/Christie Avenue*** intersection operates at an acceptable service level, both without and with the Project. However, vehicle queue spillback affects overall intersection and system operations. The addition of project traffic would exacerbate existing queuing problems during the weekday PM and Saturday afternoon peak hours, contributing to poor operations on some intersection approaches. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 3: Modify the intersection to:

a. Reconstruct the westbound approach to provide a second left turn lane. The resulting two left turn lanes should be 250 feet in length. The south side of the Powell Street bridge would need to be widened by about 12 feet to accommodate the second left turn lane.

b. Reconstruct the southbound approach to provide a southbound left-turn lane (in addition to the shared left-through lane). The lane would extend from Powell Street back to Shellmound Way. This change would require widening the west side of Christie Avenue by about 12 feet. This change requires right-of-way along the west side of Christie Avenue.

c. Re-time the Powell/Christie Loop signalized intersections to coordinate the critical movements through the intersection.

These recommendations should be implemented with Mitigation Measures 1a and 1b to provide corridor benefits.

These improvements would reduce the queuing impact to a ***less-than-significant*** level. Each of the changes requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

This impact also occurs in the 2010 and 2030 scenarios and can be attributed to existing traffic in the area, as well as traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include this recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees. Additionally, it should be noted that right-of-way for this improvement is reliant on the redevelopment of the adjacent parcels and the improvements can be phased to provide interim benefit as right-of-way becomes available.

2010 Plus Project

Impact Statement 4: The ***I-80 EB Ramps/Powell Street*** intersection is projected to operate at F during the PM peak hour and Saturday peak hour in 2010. The addition of project traffic would increase delay by more than 4 seconds during both the PM and Saturday peak hours. The addition of project traffic would also increase the 95th percentile queue lengths for several approaches that currently exceed or are projected to exceed the available storage capacity during the weekday PM and Saturday afternoon peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 4:*** Implement Mitigation Measures 1a and 1b. Implementation of these measures would reduce the impact to a ***less-than-significant*** level. However, as the intersection is within the Caltrans right-of-way and the City cannot assure the implementation of this measure, the impact may remain ***significant and unavoidable***. This recommendation should be implemented with Mitigation Measure 3 to provide corridor benefits.

Impact Statement 5: The ***Shellmound Way/Christie Avenue*** intersection is projected to operate at an acceptable service level both without and with the project in 2010. However, the addition of project traffic would result in the westbound left-turn movements exceeding the available storage length and spilling back to Shellmound Street during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 5:*** Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

Impact Statement 6: The ***Shellmound Way/Shellmound Street*** intersection is projected to operate at an acceptable service level both without and with the project in 2010. However, the addition of project traffic would result in the 95th percentile eastbound vehicle queues exceeding the available storage, resulting in vehicle queue spillback to Christie Avenue during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 6:*** Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

Impact Statement 7: The ***Powell Street/Christie Avenue*** intersection operates at an acceptable service level, both without and with the Project. However, vehicle queue spillback affects overall intersection and system operations. The addition of project traffic would exacerbate existing queuing problems, contributing to poor operations for the southbound through movement, the westbound right-turn movement and the eastbound right-turn movement during the weekday PM and Saturday afternoon peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 7:*** Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the project impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired. This recommendation should be implemented with Mitigation Measure 1a to provide corridor benefits.

2030 Plus Project

Impact Statement 8: The ***Shellmound Street/65th Street*** and the ***Overland Street/65th Street*** will operate as one intersection in 2030 and is projected to operate at a service level F with an overall average delay of 96 seconds during the PM peak hour. The addition of project trips during the weekday PM peak hour would increase overall intersection delay to 102 seconds, a six second increase. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact. Additionally, the intersection would experience deficient operations when a train crosses over 65th Street.

> ***Mitigation Measure 8***: Modify signal operations to provide protected/permitted left-turns on the southbound Shellmound Street approach. Implementation of this measure would improve the overall intersection operations to LOS E in the PM peak hour in 2030, reducing the impact to a ***less-than-significant*** level.
>
> This impact can be attributed to existing traffic in the area, as well as traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include this recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees.

Impact Statement 9: The ***Ashby Avenue/San Pablo Avenue*** intersection is projected to operate at a service level F with an overall average delay of 128 seconds during the PM peak hour in 2030. The addition of project trips during the weekday PM peak hour would increase overall intersection delay to 135 seconds, a seven second increase. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 9:*** To reduce this impact to a less than significant level, the intersection would have to modified, when traffic conditions warrant, to provide dual northbound left-turn lanes similar to the northbound left-turn lane design on San Pablo Avenue at 40th Street. Construction of this improvement would require elimination of on-street parking along San Pablo Avenue approaching the intersection. Relocation of bus stops for buses operating along San Pablo Avenue would also be required.
>
> The applicant shall pay a fee based on its fair share of the project's anticipated growth in traffic to the intersection toward the cost to implement this improvement. The payment shall be made to the City of Emeryville, for the benefit of the City of Berkeley, prior to issuance of the temporary certificate of occupancy for the last building. However, this intersection is located in the City of Berkeley and is also under the jurisdiction of Caltrans, since both Ashby Avenue and San Pablo Avenue are state highways at this intersection. Therefore, the final selection of the appropriate intersection design, as well as implementation of the modifications, are not within the jurisdiction of the City of Emeryville. Therefore, this impact would remain ***significant and unavoidable***.

Impact Statement 10: The ***I-80 EB Ramps/Powell Street*** intersection is projected to operate at F during the PM peak hour and Saturday peak hour in 2030. The addition of project traffic would increase delay by more than 4 seconds during both the PM and Saturday peak hours. The addition of project traffic would also increase the 95th percentile queue lengths for several approaches that currently exceed or are projected to exceed the available storage capacity during both the PM and Saturday peak hours. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

> ***Mitigation Measure 10:*** Implement Mitigation Measure 1a and 1b. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level. However, as the intersection is within the Caltrans right-of-way and the City cannot assure the implementation of this measure, the impact may

remain ***significant and unavoidable***. This recommendation should be implemented with Mitigation Measure 3 to provide corridor benefits.

Impact Statement 11: The ***Powell Street/Hollis Street*** intersection is projected to operate at a service level F with an overall average delay of 114 seconds during the PM peak hour in 2030. The addition of project trips during the weekday PM peak hour would increase overall intersection delay to 120 seconds, a six second increase. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 11: Implement simultaneous left-turn signal phasing for the north/south left turn movements. This will require five to six foot lane shift for northbound Hollis Street traffic approaching Powell Street and reconstruction of the southwest corner of the intersection to accommodate tractor-trailer trucks making a right-turn from Powell Street to Hollis Street. The lane shift will require right-of-way along the west side of Hollis Street. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

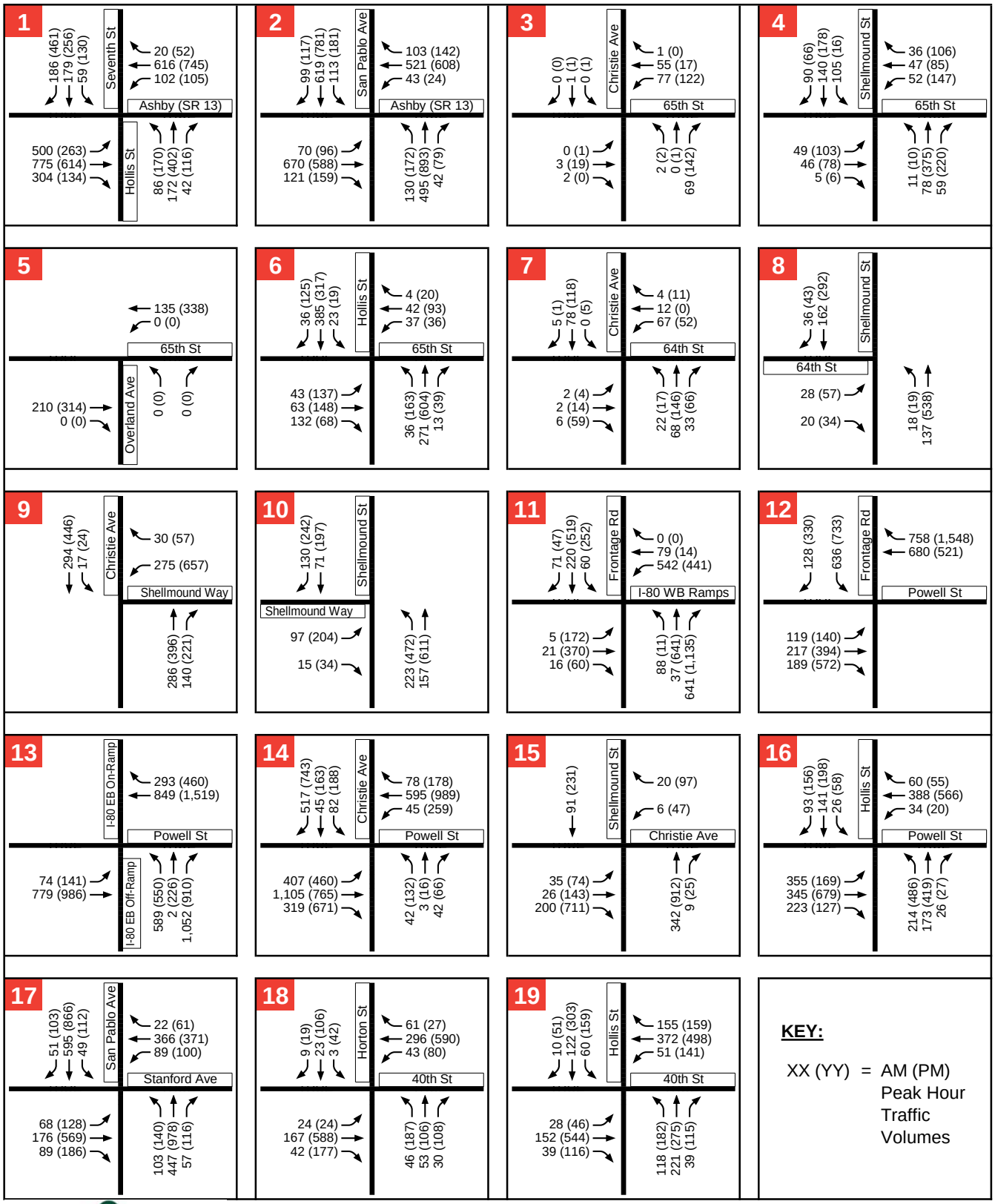
This impact can be attributed to traffic from approved, planned, and potential developments in and around Emeryville. Therefore, it is recommended that the City update the Traffic Impact Fee Program to include the recommendation, and that the Project Applicant contribute their fair share to these improvements through the payment of fees. Additionally, it should be noted that right-of-way for this improvement is reliant on the redevelopment of the adjacent parcels. Should the needed right-of-way not be acquired, the impact would remain ***significant and unavoidable***.

Impact Statement 12: The ***Shellmound Way/Christie Avenue*** intersection is projected to operate at an acceptable service level both without and with the project in 2030. However, the addition of project traffic would result in the westbound left-turn movements exceeding the available storage length and spilling back to Shellmound Street during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 12: Implement Mitigation Measures 1b and 3. Implementation of these measures would reduce the project impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired.

Impact Statement 13: The ***Powell Street/Christie Avenue*** intersection operates at an acceptable service level, both without and with the Project. However, vehicle queue spillback affects overall intersection and system operations. The addition of project traffic would exacerbate existing queuing problems, contributing poor operations on some intersection approaches during the Saturday peak hour. Based on the City of Emeryville significance criteria, this is considered a ***significant*** impact.

Mitigation Measure 13: Implement Mitigation Measures 1a and 3. Implementation of these measures would reduce the project impact to a ***less-than-significant*** level. However, the measure requires right-of-way acquisition to implement. Thus, the impact may remain ***significant and unavoidable*** until sufficient right-of-way can be acquired. This recommendation should be implemented with Mitigation Measure 1a to provide corridor benefits.



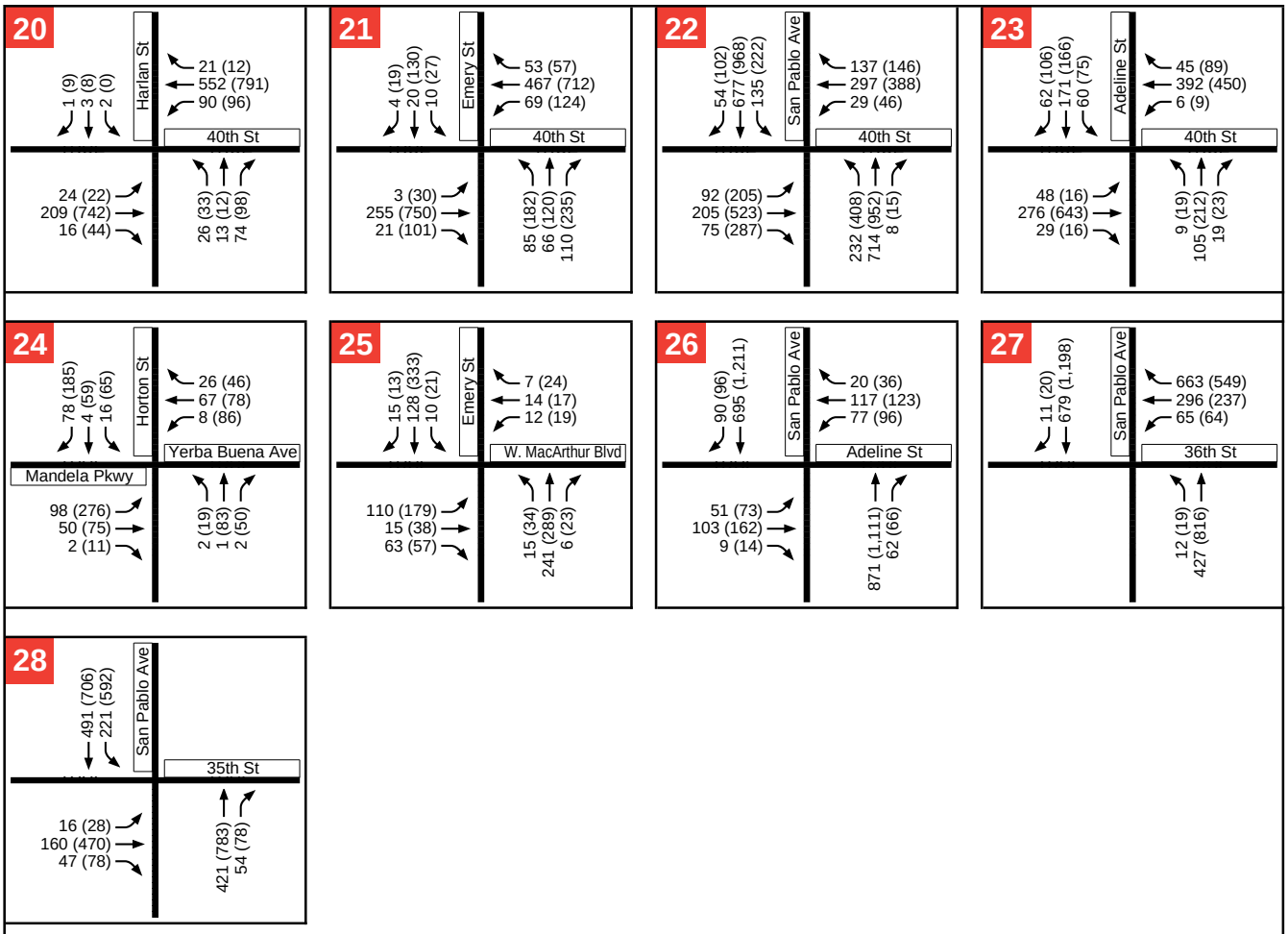
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_12A

Marketplace Redevelopment

EXISTING PLUS PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 12A



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

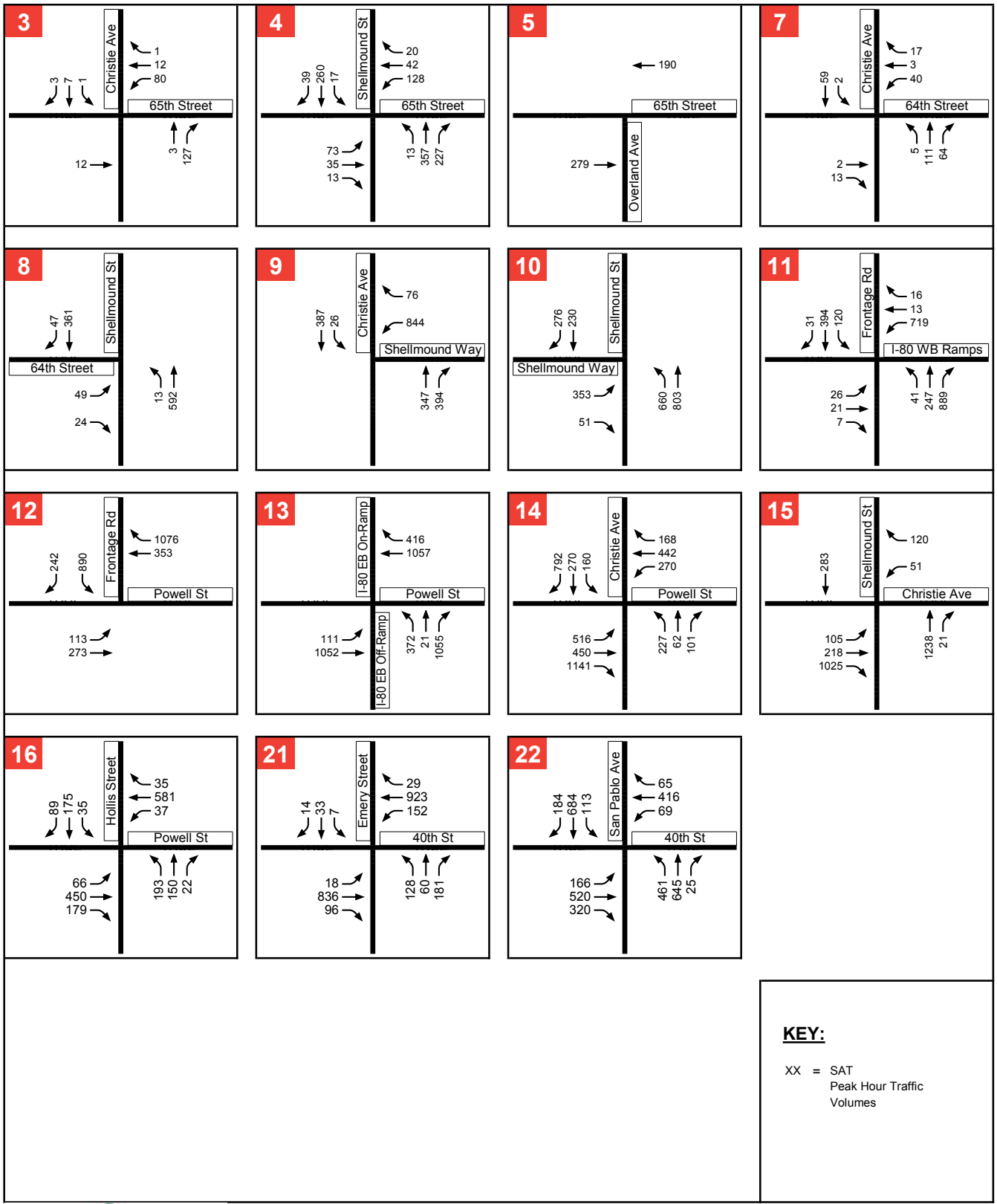
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_12B

Marketplace Redevelopment

EXISTING PLUS PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 12B



KEY:

XX = SAT Peak Hour Traffic Volumes

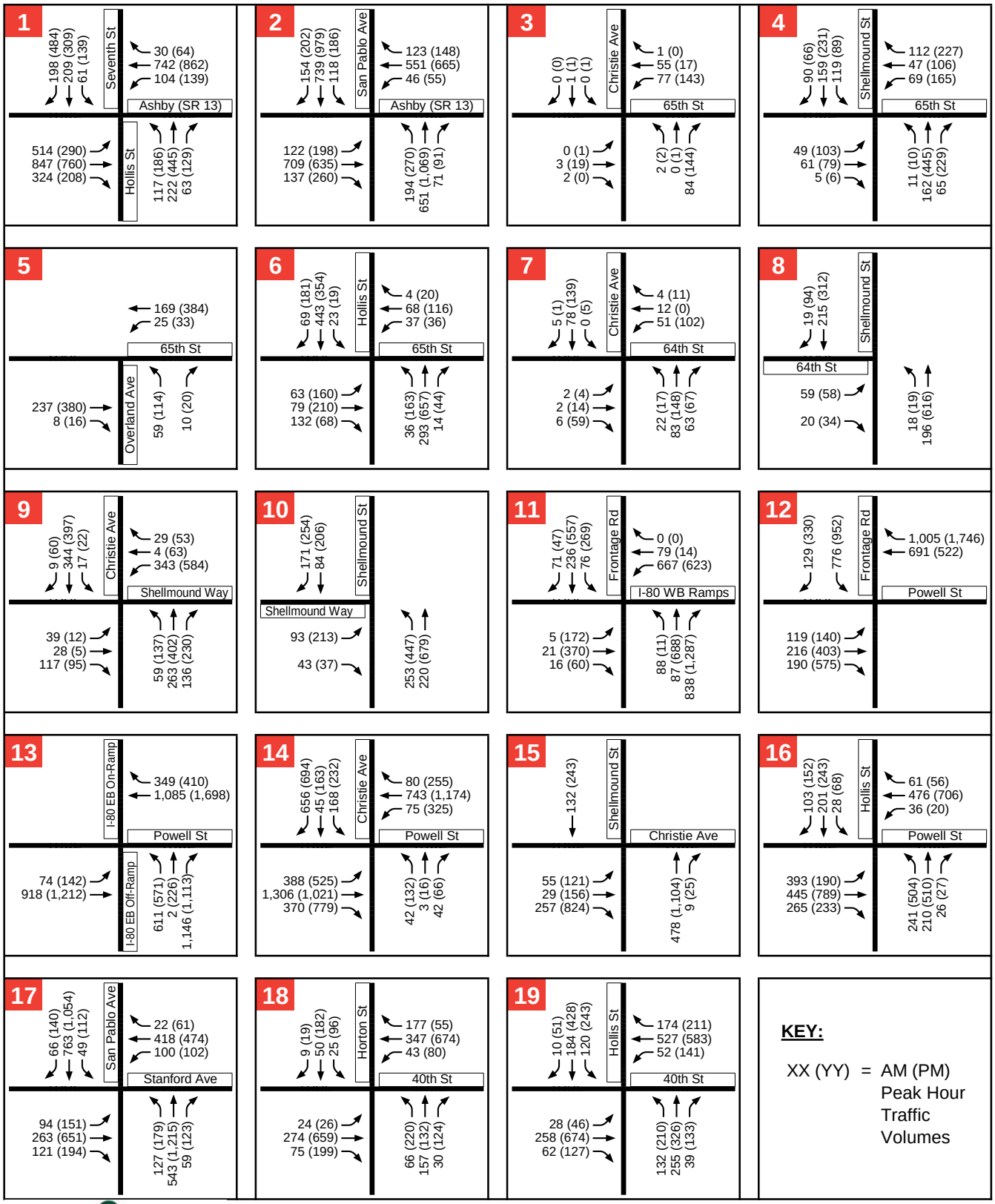
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_13

Marketplace Redevelopment

EXISTING PLUS PROJECT SATURDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 13



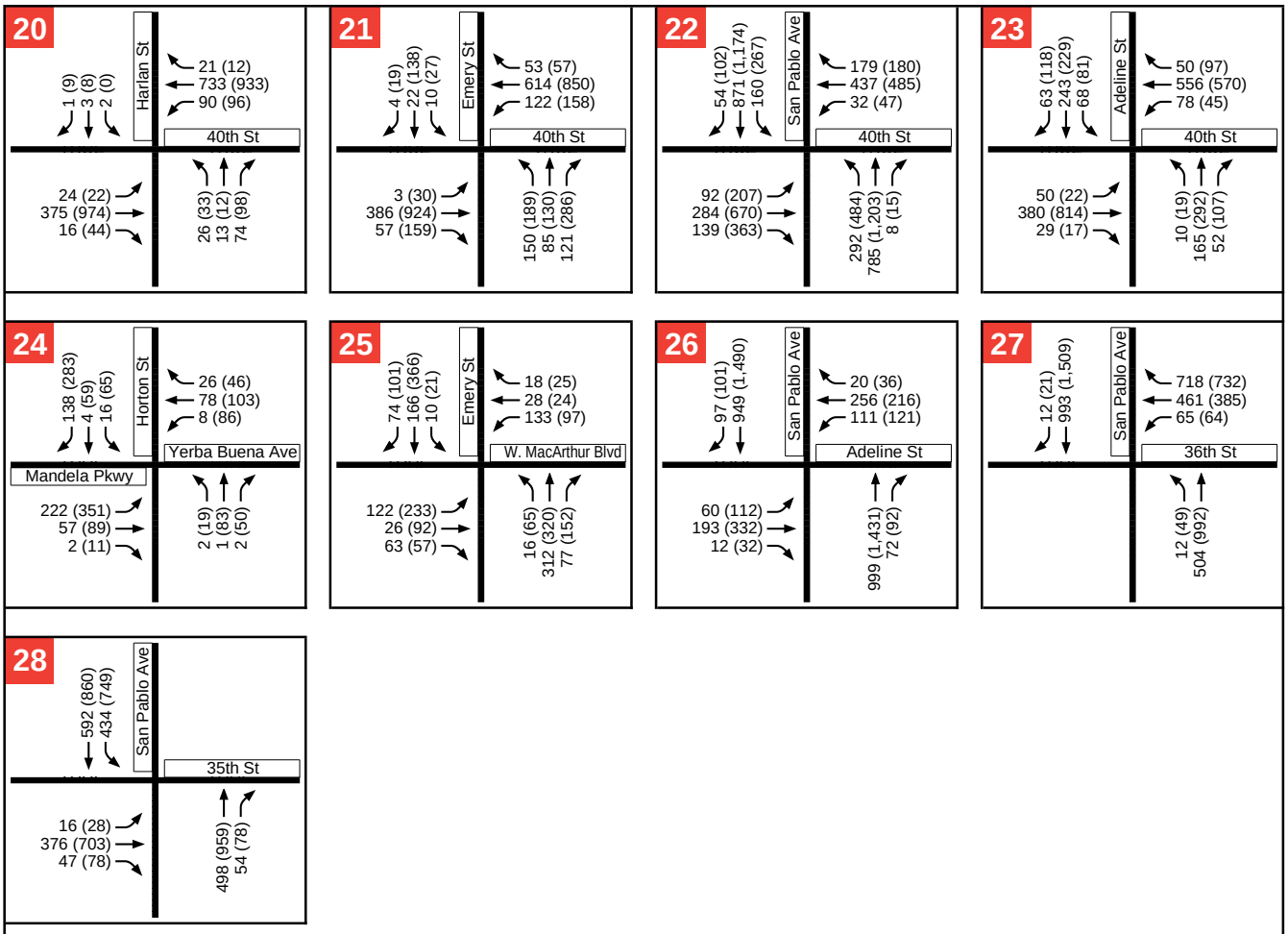
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_14A

Marketplace Redevelopment

FUTURE 2010 WITH PROJECT PEAK HOUR TRAFFIC VOLUMES

FIGURE 14A



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

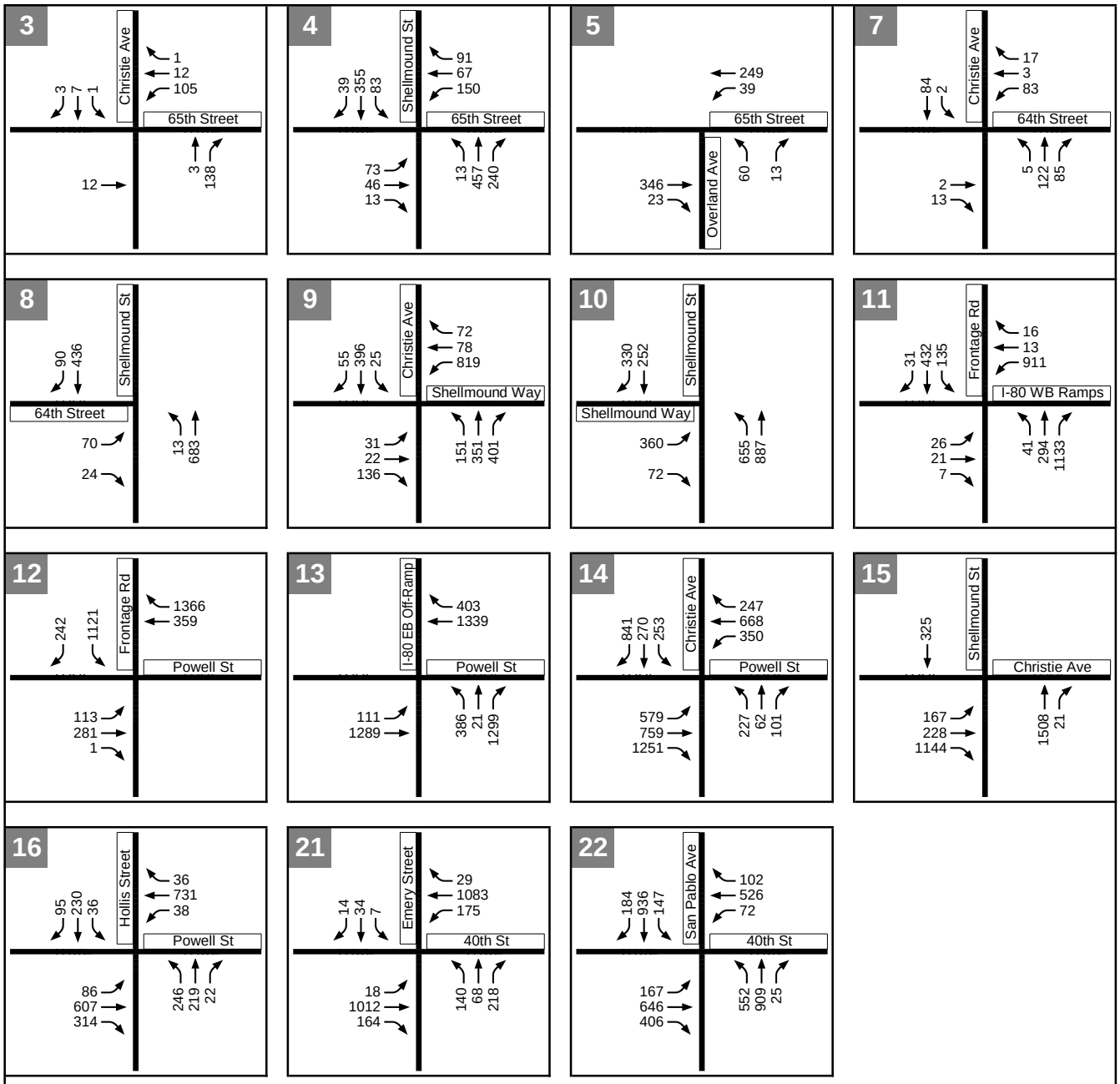
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_14B

Marketplace Redevelopment

FUTURE 2010 WITH PROJECT PEAK HOUR TRAFFIC VOLUMES

FIGURE 14B



KEY:

XX (YY) = SAT Peak Hour Traffic Volumes

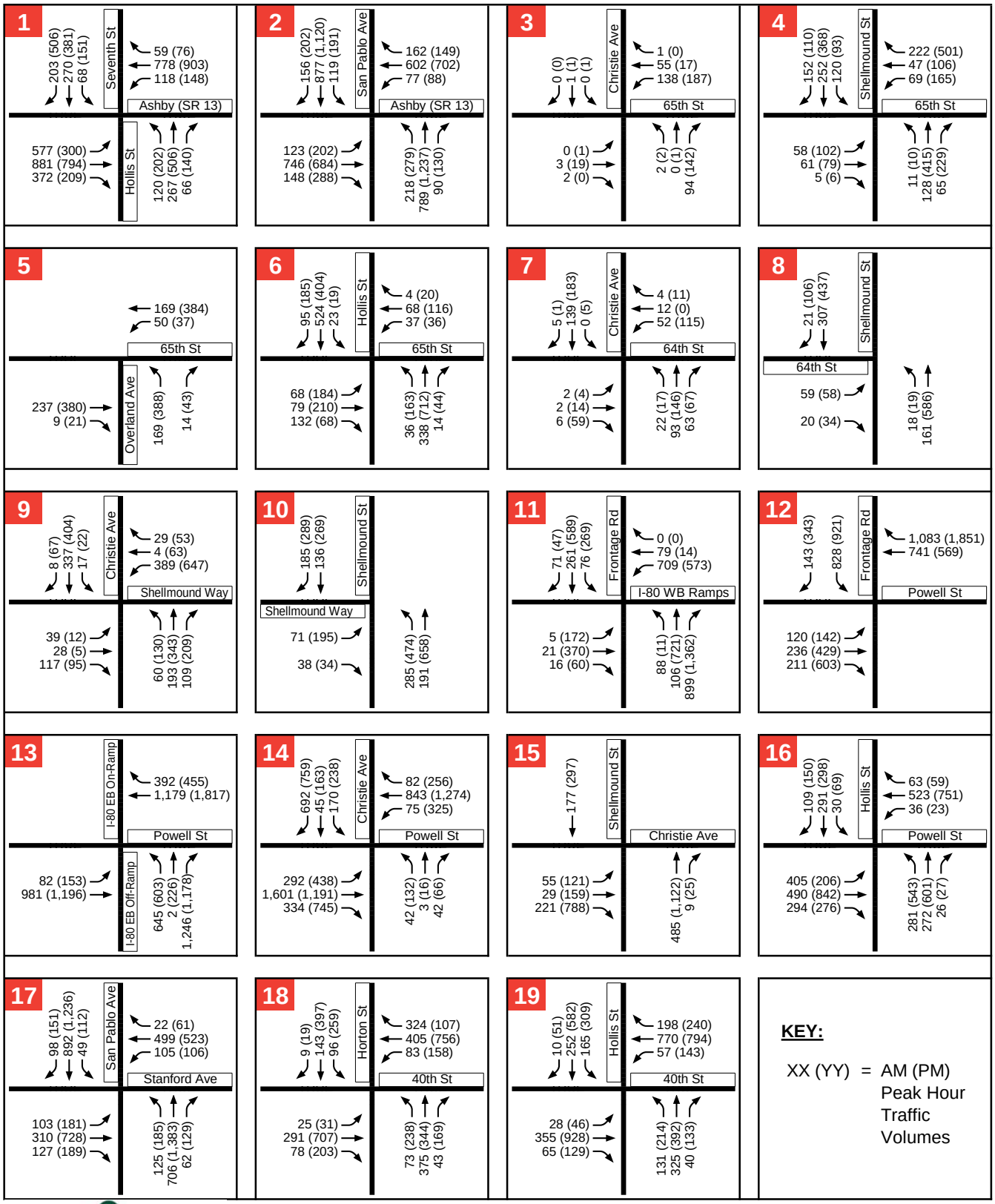
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_15

Marketplace Redevelopment

FUTURE 2010 PLUS PROJECT
SATURDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 15



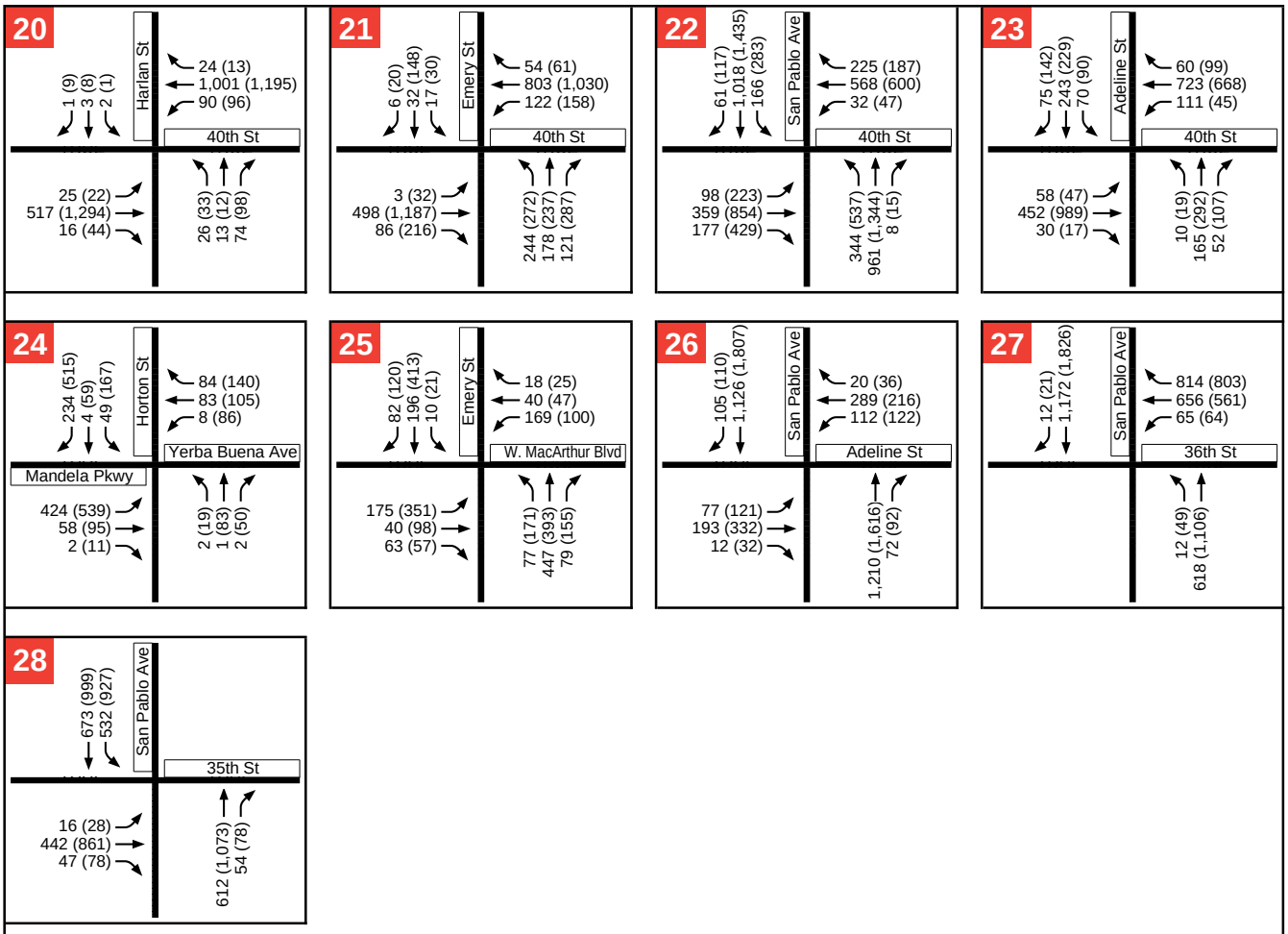
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_16A

Marketplace Redevelopment

FUTURE 2030 WITH PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 16A



KEY:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

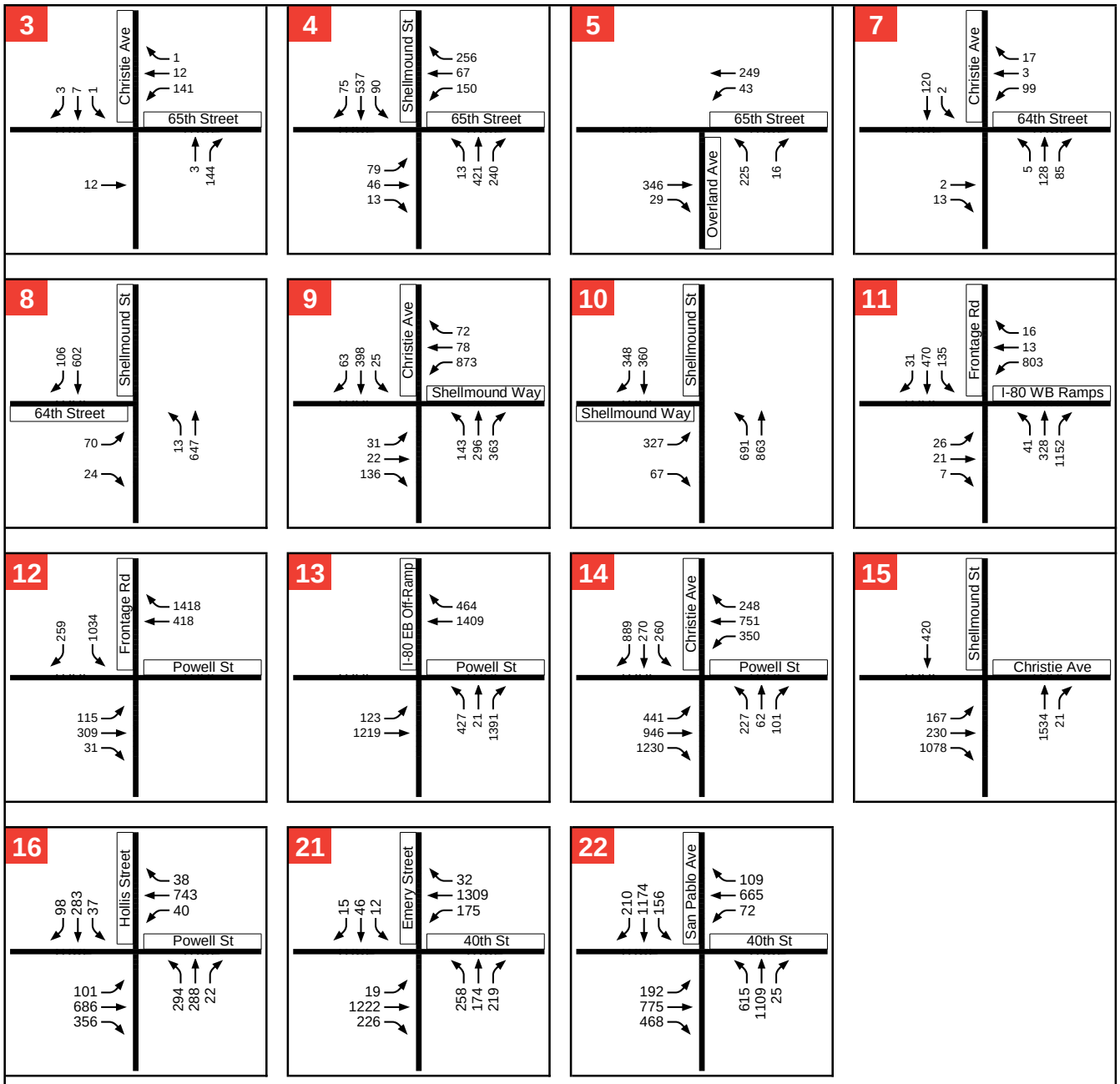
FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_16B

Marketplace Redevelopment

FUTURE 2030 WITH PROJECT WEEKDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 16B



KEY:

XX = SAT Peak Hour Traffic Volumes

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_17

Marketplace Redevelopment

FUTURE 2030 PLUS PROJECT SATURDAY PEAK HOUR TRAFFIC VOLUMES

FIGURE 17

TABLE 12
EXISTING PLUS PROJECT
PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Existing		Existing With Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	43 42	D D	43 42	D D
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	32 40	C D	33 42	C D
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street	AWSC	AM PM SAT	9 50 29	A E D	10 ***72*** ***53***	A ***F*** ***F***
5. 65th Street/Overland Avenue	--	AM PM SAT	-- -- --	-- -- --	-- -- --	-- -- --
6. 65th Street/Hollis Street	Signal	AM PM	14 23	B C	14 25	B C
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 8	A A A	8 9 8	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	1 (10) 2 (16) 1 (16)	A (A) A (C) A (C)	2 (11) 2 (19) 2 (21)	A (B) A (C) A (C)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	8 11 17	A B B	9 10 24	A A C
10. Shellmound Way/Shellmound Street	Signal	AM PM SAT	33 22 13	C C B	33 22 19	C C B
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	15 37 16	B D B	15 38 16	B D B
12. Powell Street/Frontage Road	Signal	AM PM SAT	19 18 22	B B C	19 18 22	B B C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM PM SAT	26 73 56	C E E	27 ***83*** ***62***	C ***F*** ***E***
14. Powell Street/Christie Avenue	Signal	AM PM SAT	29 46 46	C D D	28 46 45	C D D

TABLE 12
EXISTING PLUS PROJECT
PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Existing		Existing With Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
15. Christie Avenue/Shellmound Street	Signal	AM PM SAT	20 41 31	B D C	21 41 32	C D C
16. Powell Street/Hollis Street	Signal	AM PM SAT	30 51 24	C D C	30 55 24	C D C
17. Stanford Avenue/San Pablo Avenue	Signal	AM PM	29 39	C D	29 39	C D
18. 40th Street/Horton Street	Signal	AM PM	21 28	C C	21 28	C C
19. 40th Street/Hollis Street	Signal	AM PM	26 38	C D	27 39	C D
20. 40th Street/Harlan Street	SSSC	AM PM	3 (24) 5 (53)	A (C) A (F)	3 (25) 5 (57)	A (C) A (F)
21. 40th Street/Emery Street	Signal	AM PM SAT	24 32 21	C C C	24 32 21	C C C
22. 40th Street/San Pablo Avenue	Signal	AM PM SAT	33 45 39	C D D	33 45 39	C D D
23. 40th Street/Adeline Street	Signal	AM PM	12 12	B B	12 12	B B
24. Mandela Pkwy/Horton Street	AWSC	AM PM	8 14	A B	8 15	A C
25. MacArthur Boulevard/Emery Street	Signal	AM PM	24 11	C B	24 11	C B
26. Adeline Street/San Pablo Avenue	Signal	AM PM	15 19	B B	15 19	B B
27. 36th Street/San Pablo Avenue	Signal	AM PM	28 24	C C	28 24	C C
28. 35th Street/San Pablo Avenue	Signal	AM PM	13 30	B C	13 30	B C

Notes: Results in ***bold italics*** indicates significant impact.

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.

Source: Fehr & Peers, 2007.

TABLE 13
EXISTING PLUS PROJECT VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	95th Percentile Queue Length (in feet) [1]					
			AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
Shellmound Way/ Christie Avenue	Northbound	235	25	25	25	25	100	100
	Southbound	--	100	100	150	175	150	150
	Westbound	335	25	25	250	250	250	250
Shellmound Way/ Shellmound Street	Northbound left	400	75	75	125	125	225	225
	Southbound right	200	50	75	100	125	75	125
	Southbound through	--	50	50	175	175	200	225
	Eastbound	335	100	150	50	125	75	275
Powell Street/I-80 Eastbound Ramps	Northbound left	900	500	525	725	725	325	325
	Northbound through	900	600	625	900	***950***	325	375
	Northbound right	900	550	550	1,050	***1,150***	850	***950***
	Westbound through	400	100	150	350	***450***	325	350
	Westbound right	400	25	25	75	75	150	150
	Eastbound left	275	50	50	175	175	150	150
	Eastbound through	275	150	150	100	100	375	375
Powell Street/ Christie Avenue	Northbound left	200	50	50	125	125	250	250
	Northbound through	200	50	50	125	125	250	250
	Northbound right	200	50	50	75	75	75	75
	Southbound Through	235	125	150	350	***400***	475	***575***
	Southbound Right	235	25	75	50	50	100	150
	Westbound left	200	50	50	400	400	425	425
	Westbound through	--	150	150	575	575	200	200
	Westbound right	50	50	50	150	150	100	100
	Eastbound left	400	175	200	175	200	150	200
	Eastbound through	450	550	550	300	300	275	275
	Eastbound Right	450	25	25	350	350	425	425

Notes: 1. 95th percentile vehicle queue in feet as calculated by Synchro 6.0.
2. Results in ***bold italics*** indicates significant impact.

Source: Fehr & Peers, 2007.

TABLE 14
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Future 2010 Without Project		Future 2010 With Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	46 50	D D	46 50	D D
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	32 81	C F	33 84	C F
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street[3]	Signal	AM PM SAT	25 46 32	C D C	25 51 32	C D C
5. 65th Street/Overland Avenue[3]	Signal					
6. 65th Street/Hollis Street	Signal	AM PM	15 32	B C	16 36	B D
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 8	A A A	8 9 8	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	2 (11) 2 (17) 2 (26)	A (B) A (C) A (D)	2 (12) 2 (21) 3 (43)	A (B) A (C) A (E)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	30 19 25	C B C	29 21 30	C C C
10. Shellmound Way/Shellmound Street	Signal	AM PM SAT	30 25 20	C C B	30 25 24	C C C
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	15 42 19	B D B	15 44 21	B D C
12. Powell Street/Frontage Road	Signal	AM PM SAT	18 20 23	B C C	18 22 24	B C C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM PM SAT	28 101 93	C F F	30 ***114*** ***106***	C ***F*** ***F***
14. Powell Street/Christie Avenue	Signal	AM PM SAT	33 86 108	C F F	33 86 111	C F F
15. Christie Avenue/Shellmound Street	Signal	AM PM SAT	12 24 24	B C C	12 24 24	B C C
16. Powell Street/Hollis Street	Signal	AM PM SAT	37 80 28	D E C	38 84 30	D F C

TABLE 14
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Future 2010 Without Project		Future 2010 With Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
17. Stanford Avenue/San Pablo Avenue	Signal	AM PM	31 69	C E	31 69	C E
18. 40th Street/Horton Street	Signal	AM PM	23 34	C C	23 34	C C
19. 40th Street/Hollis Street	Signal	AM PM	28 50	C D	29 52	C D
20. 40th Street/Harlan Street	SSSC	AM PM	2 (36) 9 (125)	A (E) A (F)	2 (36) 10 (135)	A (E) A (F)
21. 40th Street/Emery Street	Signal	AM PM SAT	23 36 24	C D C	23 36 24	C D C
22. 40th Street/San Pablo Avenue	Signal	AM PM SAT	36 72 70	D E E	36 74 72	D E E
23. 40th Street/Adeline Street	Signal	AM PM	15 15	B B	15 15	B B
24. Mandela Pkwy/Horton Street	AWSC	AM PM	9 22	A C	9 24	A C
25. MacArthur Boulevard/Emery Street	Signal	AM PM	15 18	B B	15 18	B B
26. Adeline Street/San Pablo Avenue	Signal	AM PM	22 36	C D	22 36	C D
27. 36th Street/San Pablo Avenue	Signal	AM PM	28 59	C E	28 60	C E
28. 35th Street/San Pablo Avenue	Signal	AM PM	18 38	B D	18 38	B D

Notes: Results in ***bold italics*** indicates significant impact.

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.
3. The intersections of 65th Street/Shellmound Street and 65th Street/Overland Avenue were analyzed as an interconnected signal system due to the railroad crossing. Intersection operations will be LOS F when a train crosses through the intersection.

Source: Fehr & Peers, 2007.

TABLE 15
FUTURE 2010 PLUS PROJECT VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	95th Percentile Queue Length (in feet) [1]					
			AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
Shellmound Way/ Christie Avenue	Northbound	235	25	25	100	100	50	50
	Southbound	--	75	75	175	175	200	225
	Westbound	335	225	275	100	125	525	***625***
Shellmound Way/ Shellmound Street	Northbound left	400	75	100	175	175	225	250
	Southbound right	200	50	75	100	125	100	150
	Southbound through	--	50	50	150	175	225	***250***
	Eastbound	335	75	125	75	225	250	***400***
Powell Street/I-80 Eastbound Ramps	Northbound left	900	550	550	725	725	350	350
	Northbound through	900	650	675	1,025	***1,075***	600	675
	Northbound right	900	600	600	975	***1,025***	1,100	***1,225***
	Westbound through	400	150	200	350	***550***	400	***500***
	Westbound right	400	25	25	50	50	125	100
	Eastbound left	275	50	50	150	150	125	125
	Eastbound through	275	150	250	100	100	525	***550***
Powell Street/ Christie Avenue	Northbound left	200	50	50	125	125	250	250
	Northbound through	200	50	50	125	125	250	250
	Northbound right	200	50	50	75	75	75	75
	Southbound Through	235	175	175	425	***450***	600	***625***
	Southbound Right	235	75	100	100	125	125	200
	Westbound left	200	125	125	500	500	550	550
	Westbound through	--	325	325	700	700	325	325
	Westbound right	50	75	75	225	***275***	150	***175***
	Eastbound left	400	150	175	175	225	175	250
	Eastbound through	450	650	650	500	*500*	675	675
	Eastbound Right	450	25	25	450	***475***	600	600

Notes: 1. 95th percentile vehicle queue in feet as calculated by Synchro 6.0.
2. Results in ***bold italics*** indicates significant impact.

Source: Fehr & Peers, 2007.

TABLE 16
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Future 2030 without Project		Future 2030 with Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	59 63	E E	60 64	E E
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	40 128	D F	41 ***135***	D ***F***
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (12) 8 (14) 8 (11)	A (B) A (B) A (B)	7 (12) 8 (15) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street[3]	Signal	AM PM SAT	31 96 43	C F D	32 ***102*** 53	C ***F*** D
5. 65th Street/Overland Avenue[3]	Signal					
6. 65th Street/Hollis Street	Signal	AM PM	15 40	B D	16 47	B D
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 9	A A A	8 9 9	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	2 (12) 2 (20) 2 (46)	A (B) A (C) A (E)	2 (13) 2 (27) 8 (127)	A (B) A (D) A (F)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	34 19 28	C B C	36 21 32	D C C
10. Shellmound Way/Shellmound Street	Signal	AM PM SAT	29 24 20	C C B	29 24 24	C C C
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	16 42 20	B D B	16 43 20	B D B
12. Powell Street/Frontage Road	Signal	AM PM SAT	18 21 22	B C C	18 21 22	B C C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM PM SAT	37 102 101	D F F	39 ***115*** ***112***	D ***F*** ***F***
14. Powell Street/Christie Avenue	Signal	AM PM SAT	56 90 136	E F F	56 90 136	E F F
15. Christie Avenue/Shellmound Street	Signal	AM PM SAT	12 22 23	B C C	12 22 23	B C C
16. Powell Street/Hollis Street	Signal	AM PM SAT	51 114 45	D F D	51 ***120*** 50	D ***F*** D

TABLE 16
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Future 2030 without Project		Future 2030 with Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
17. Stanford Avenue/San Pablo Avenue	Signal	AM PM	32 119	C F	32 120	C F
18. 40th Street/Horton Street	Signal	AM PM	37 127	D F	37 128	D F
19. 40th Street/Hollis Street	Signal	AM PM	35 82	D F	38 85	D F
20. 40th Street/Harlan Street	SSSC	AM PM	3 (68) >100 (>100)	A (F) F (F)	3 (70) >100 (>100)	A (F) F (F)
21. 40th Street/Emery Street	Signal	AM PM SAT	29 104 81	C F F	29 106 83	C F F
22. 40th Street/San Pablo Avenue	Signal	AM PM SAT	45 142 130	D F F	45 145 133	D F F
23. 40th Street/Adeline Street	Signal	AM PM	15 16	B B	15 16	B B
24. Mandela Pkwy/Horton Street	Signal	AM PM	11 71	B E	11 75	B E
25. MacArthur Boulevard/Emery Street	Signal	AM PM	21 86	C F	21 86	C F
26. Adeline Street/San Pablo Avenue	Signal	AM PM	24 48	C D	24 50	C D
27. 36th Street/San Pablo Avenue	Signal	AM PM	47 74	D E	48 74	D E
28. 35th Street/San Pablo Avenue	Signal	AM PM	21 61	C E	21 62	C E

Notes: Results in ***bold italics*** indicates significant impact.

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.
3. The intersections of 65th Street/Shellmound Street and 65th Street/Overland Avenue were analyzed as an interconnected signal system due to the railroad crossing. Intersection operations will be LOS F when a train crosses through the intersection.

Source: Fehr & Peers, 2007.

TABLE 17
FUTURE 2030 PLUS PROJECT VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	95th Percentile Queue Length (in feet) [1]					
			AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
Shellmound Way/ Christie Avenue	Northbound through	235	25	25	75	100	75	75
	Southbound	--	75	75	175	200	200	225
	Westbound	335	250	300	100	150	575	***675***
Shellmound Way/ Shellmound Street	Northbound left	400	100	100	125	125	225	275
	Southbound right	200	75	75	150	200	125	175
	Southbound through	200	75	75	200	225	325	***375***
	Eastbound	335	50	100	75	175	250	325
Powell Street/I-80 Eastbound Ramps	Northbound left	900	600	625	750	750	400	400
	Northbound through	900	750	775	1,000	***1,050***	675	750
	Northbound right	900	675	700	975	***1,050***	1,250	***1,350***
	Westbound through	400	175	225	400	***575***	450	***550***
	Westbound right	400	25	25	50	50	125	125
	Eastbound left	275	50	50	150	150	150	150
	Eastbound through	275	150	150	125	125	475	***500***
Powell Street/ Christie Avenue	Northbound left	200	50	50	125	125	250	**250**
	Northbound through	200	50	50	125	125	250	250
	Northbound right	200	50	50	75	75	75	75
	Southbound Through	235	150	175	375	425	600	**600**
	Southbound Right	235	75	100	150	125	150	225
	Westbound left	200	100	100	475	475	550	**550**
	Westbound through	--	400	400	750	750	350	350
	Westbound right	50	75	75	225	250	175	**200**
	Eastbound left	400	100	125	150	175	125	175
	Eastbound through	450	775	**775**	550	550	800	**800**
	Eastbound Right	450	25	25	425	425	700	**700**

Notes: 1. 95th percentile vehicle queue in feet as calculated by Synchro 6.0.
2. Results in ***bold italics*** indicates significant impact.

Source: Fehr & Peers, 2007.

TABLE 18
PROJECT CONTRIBUTION TO IMPACTED INTERSECTIONS

Intersection	Existing Traffic[1]	Other Traffic[2]	Marketplace Traffic[2]
I-80 EB Ramps/Powell Street	4,414 (78 percent)	1,043 (19 percent)	171 (3 percent)
Powell Street/Christie Avenue	4,383 (78 percent)	990 (18 percent)	230 (4 percent)
Shellmound Way/Christie Avenue	1,554 (76 percent)	267 (13 percent)	229 (11 percent)
Shellmound Way/Shellmound Street	1,561 (82 percent)	162 (8 percent)	196 (10 percent)
Shellmound Street/Overland Street/65th Street	1,264 (56 percent)	854 (38 percent)	146 (6 percent)
Ashby Avenue/San Pablo Avenue	3,803 (72 percent)	1,432 (27 percent)	37 (1 percent)
Powell Street/Hollis Street	2,902 (75 percent)	885 (23 percent)	58 (2 percent)

Notes: 1. Based on PM Peak hour traffic volumes
2. Based on 2030 Conditions.

Source: Fehr & Peers, 2007.

6. ALAMEDA COUNTY CONGESTION MANAGEMENT AGENCY (ACCMA) MTS ROADWAY ANALYSIS

This chapter outlines the ACCMA roadway analysis, which considers the impact of the Project on freeways, major arterials, and other major roadways in Alameda County. Main items of discussion include the notice of preparation (NOP) comments from the ACCMA, the geographic scope of the ACCMA roadway analysis, the analysis method, and the results for 2010 and 2025. Impacts to the transit system, including BART and AC Transit, are discussed in Chapter 7.

NOP COMMENTS

The ACCMA made the following statements in a NOP comment letter dated December 14, 2005:

> *Potential impacts of the project on the Metropolitan Transportation System (MTS) need to be addressed. (See 2005 CMP Figures 1 and 2). The DEIR should address all potential impacts of the project on the MTS roadway and transit systems. These include I-80, I-580, I-880, I-980, SR 24, SR 13/Ashby Avenue, Powell Street and San Pablo Avenue as well as BART and AC Transit. Potential impacts of the project must be addressed for 2010 and 2025 conditions.*
>
> - *Please note that the ACCMA does not have a policy for determining a threshold of significance for Level of Service for the Land Use Analysis Program of the CMP. Professional judgment should be applied to determine the significance of project impacts (Please see chapter 6 of the 2003 CMP for more information).*
> - *In addition, the adopted 2003 CMP requires the use of the 1985 Highway Capacity Manual* for freeway capacity standards.

Based on these comments, Fehr & Peers completed an analysis of the MTS roadways, as requested by the ACCMA.

ACCMA ROADWAY ANALYSIS STUDY AREA

As requested by the ACCMA, freeway and surface street segments in Emeryville and other areas of Alameda County were analyzed. The complete list of freeway and roadway segments from the NOP letter was included in the analysis. The following freeway and roadway segments were analyzed:

- I-80/I-580 (3 segments)
- I-580 (1 segment)
- I-880 (3 segments)
- I-980 (1 segment)
- SR 24 (1 segment)
- SR 13/Ashby Avenue (2 segments)
- Powell Street (2 segments)
- San Pablo Avenue (4 segments)

TRAFFIC FORECASTS

Fehr & Peers used the ACCMA model to forecast 2010 and 2025 traffic volumes on the MTS roadway system. The forecasts for the MTS system differ from the intersection forecasts previously discussed in the following aspects:

- The land use data sets used for the intersection forecasts and the MTS forecasts are different. The intersection forecasts, which are used to assess project traffic impacts on City of Emeryville intersections, are based on land use data developed by the City of Emeryville, which differs from the data in the ACCMA model.

- The MTS roadway analysis reports the outputs of the ACCMA model directly on a roadway segment level.

Due to the differences in the land use data and future volume development, the results from the two analyses (intersection and roadway segment) are not directly comparable.

The results of the ACCMA model were used to forecast the No Project condition for 2010 and 2025. Project trips were manually distributed to the MTS roadway segments (including both freeways and surface streets) identified above using the project trip distribution presented in Chapter 3. The distribution of project trips onto the MTS segments results in the With Project volumes for 2010 and 2025.

ANALYSIS METHOD

Operations of the MTS freeway and surface street segments were assessed based on volume-to-capacity (V/C) ratios. For freeway segments, a per-lane capacity of 2,000 vehicles per hour was used. This capacity is consistent with the 2003 and 2004 *Congestion Management Plan* documents. For surface streets, a per-lane capacity of 800 vehicles per hour was used. Roadway segments with a V/C ratio greater than 1.0 are assigned LOS F.

SIGNIFICANCE CRITERIA

According to the significance criteria presented previously in Chapter 1, the addition of project traffic causes a significant impact on an MTS roadway segment if:

1. The addition of project traffic causes a segment's operation to degrade to LOS F.
2. The addition of project trips causes the V/C ratio to increase by more than 5 percent on a segment that already operates at LOS F without the project traffic.

ANALYSIS RESULTS

The MTS AM and PM peak hour roadway segment analysis under 2010 and 2025 conditions are summarized in Tables 19 through 22. The addition of project trips would not cause any of the studied roadway or freeway segment to degrade to LOS F or increase the V/C ratio of a segment already operating at LOS F by more than three percent. Thus, the proposed project would not cause a significant impact on any MTS roadway segments.

TABLE 19
MTS ROADWAY SYSTEM ANALYSIS SUMMARY - 2010 AM

Study Segment	Direction	# Lanes	No Project Volume	Project Volume	With Project Volume	Percent Increase	No Project V/C	With Project V/C	No Project LOS	With Project LOS	Impact?
Freeway Segments											
I-80 North of Ashby Ave	EB WB	4 4	7,335 8,361	19 24	7,354 8,395	0.26% 0.41%	0.92 1.05	0.92 1.05	E F	E F	No No
I-80 North of Powell Street	EB WB	4 5	9,444 7,959	19 24	9,463 7,983	0.20% 0.30%	1.18 0.80	1.18 0.80	F D	F D	No No
I-80 West of I-580	EB WB	5 5	13,249 6,190	18 11	13,267 6,201	0.14% 0.18%	1.32 0.62	1.33 0.62	F C	F C	No No
I -580 East of San Pablo Ave	EB WB	5 5	6,359 9,281	54 30	6,413 9,311	0.85% 0.32%	0.64 0.93	0.64 0.93	C E	C E	No No
I – 880 south of I-80	NB SB	3 4	3,871 3,196	11 20	3,882 3,216	0.28% 0.63%	0.65 0.40	0.65 0.40	C B	C B	No No
I -980 south of SR 24	NB SB	5 4	2,762 6,504	0 0	2,762 6,504	0.00% 0.00%	0.28 0.81	0.28 0.81	A D	A D	No No
Ashby Ave west of San Pablo Ave	EB WB	2 2	626 1,420	1 2	627 1,422	0.16% 0.14%	0.16 0.36	0.16 0.36	A B	A B	No No
Ashby Ave east of San Pablo Ave	EB WB	1 1	645 1,251	7 4	652 1,255	1.09% 0.32%	0.32 0.63	0.33 0.63	A C	A C	No No
SR 24 west of Caldecott Tunnel	EB WB	4 4	2,384 9,581	29 16	2,413 9,597	1.22% 0.17%	0.30 1.20	0.30 1.20	A F	A F	No No
Arterials											
San Pablo Ave north Ashby Ave	NB SB	2 2	1,336 1,726	11 6	1,347 1,732	0.82% 0.65%	0.84 1.08	0.84 1.08	D F	D F	No No
San Pablo Ave south Ashby Ave	NB SB	2 2	865 1,311	18 10	883 1,321	2.08% 0.76%	0.54 0.82	0.55 0.83	B D	B D	No No
San Pablo Ave south of Stanford Ave	NB SB	2 2	1,078 1,410	0 0	1,078 1,410	0.00% 0.00%	0.67 0.88	0.67 0.88	C D	C D	No No
Powell Street west of San Pablo Ave	EB WB	2 2	156 519	43 89	199 608	27.56% 17.15%	0.10 0.32	0.12 0.38	A A	A S	No No
Powell Street east of San Pablo Ave	EB WB	2 2	447 842	9 5	456 847	2.01% 0.59%	0.28 0.53	0.29 0.53	A B	A B	No No

Source: Fehr & Peers, 2007.

TABLE 20
MTS ROADWAY SYSTEM ANALYSIS SUMMARY - 2010 PM

Study Segment	Direction	# Lanes	No Project Volume	Project Volume	With Project Volume	Percent Increase	No Project V/C	With Project V/C	No Project LOS	With Project LOS	Impact?
Freeway Segments											
I-80 North of Ashby Ave	EB WB	4 4	9,157 8,337	44 32	9,201 8,369	0.48% 0.38%	1.14 1.04	1.15 1.05	F F	F F	No No
I-80 North of Powell Street	EB WB	4 5	9,768 9,931	44 51	9,812 9,982	0.45% 0.51%	1.22 0.99	1.23 1.00	F E	F E	No No
I-80 West of I-580	EB WB	5 5	11,440 13,297	17 24	11,457 13,321	0.15% 0.18%	1.14 1.33	1.15 1.33	F F	F F	No No
I -580 East of San Pablo Ave	EB WB	5 5	9,632 7,943	50 70	9,682 8,013	0.52% 0.88%	0.96 0.79	0.97 0.80	E D	E D	No No
I – 880 south of I-80	NB SB	3 4	4,397 4,999	26 18	4,423 5,017	0.59% 0.36%	0.73 0.62	0.74 0.63	C C	C C	No No
I -980 south of SR 24	NB SB	5 4	2,762 3,429	0 0	2,762 3,429	0.00% 0.00%	0.28 0.43	0.28 0.43	A B	A B	No No
Ashby Ave west of San Pablo Ave	EB WB	2 2	1,425 1,071	4 3	1,429 1,074	0.28% 0.28%	0.36 0.27	0.36 0.27	B A	B A	No No
Ashby Ave east of San Pablo Ave	EB WB	1 1	1,092 954	5 8	1,097 962	0.46% 0.84%	0.55 0.48	0.55 0.48	B B	B B	No No
SR 24 west of Caldecott Tunnel	EB WB	4 4	8,554 4,268	27 37	8,581 4,305	0.32% 0.87%	1.07 0.53	1.07 0.54	F B	F B	No No
Arterials											
San Pablo Ave north Ashby Ave	NB SB	2 2	1,941 2,210	10 14	1,951 2,224	0.52% 0.63%	1.21 1.38	1.22 1.39	F F	F F	No No
San Pablo Ave south Ashby Ave	NB SB	2 2	1,445 1,497	15 22	1,460 1,519	1.04% 1.47%	0.91 0.94	0.91 0.95	E E	E E	No No
San Pablo Ave south of Stanford Ave	NB SB	2 2	1,536 1,669	0 0	1,536 1,669	0.00% 0.00%	0.96 1.04	0.96 1.04	E F	E F	No No
Powell Street west of San Pablo Ave	EB WB	2 2	211 659	83 106	294 765	39.34% 16.08%	0.13 0.41	0.18 0.48	A B	A B	No No
Powell Street east of San Pablo Ave	EB WB	2 2	456 973	13 10	469 983	2.85% 1.03%	0.29 0.61	0.29 0.61	A C	A C	No No

Source: Fehr & Peers, 2007.

TABLE 21
MTS ROADWAY SYSTEM ANALYSIS SUMMARY - 2025 AM

Study Segment	Direction	# Lanes	No Project Volume	Project Volume	With Project Volume	Percent Increase	No Project V/C	With Project V/C	No Project LOS	With Project LOS	Impact?
Freeway Segments											
I-80 North of Ashby Ave	EB WB	4 4	8,546 7,644	19 34	8,565 7,678	0.22% 0.44%	1.07 0.96	1.07 0.96	F E	F E	No No
I-80 North of Powell Street	EB WB	4 5	9,174 8,081	7 37	9,181 8,118	0.08% 0.46%	1.15 0.81	1.15 0.81	F D	F D	No No
I-80 West of I-580	EB WB	5 5	14,810 4,636	18 11	14,828 4,647	0.12% 0.24%	1.48 0.46	1.48 0.46	F B	F B	No No
I -580 East of San Pablo Ave	EB WB	5 5	5,425 9,932	54 30	5,479 9,962	1.00% 0.30%	0.54 0.99	0.55 1.00	B E	B E	No No
I – 880 south of I-80	NB SB	3 4	4,211 2,413	11 20	4,222 2,433	0.26% 0.83%	0.70 0.30	0.70 0.30	C A	C A	No No
I -980 south of SR 24	NB SB	5 4	2,865 6,950	0 0	2,865 6,950	0.00% 0.00%	0.29 0.87	0.29 0.87	A D	A D	No No
Ashby Ave west of San Pablo Ave	EB WB	2 2	566 1,320	1 2	567 1,322	0.18% 0.15%	0.14 0.33	0.14 0.33	A A	A A	No No
Ashby Ave east of San Pablo Ave	EB WB	1 1	682 1,394	7 4	689 1,398	1.03% 0.29%	0.34 0.70	0.34 0.70	A C	A C	No No
SR 24 west of Caldecott Tunnel	EB WB	4 4	2,157 10,022	29 16	2,186 10,038	1.34% 0.16%	0.27 1.25	0.27 1.25	A F	A F	No No
Arterials											
San Pablo Ave north Ashby Ave	NB SB	2 2	1,482 1,762	11 6	1,493 1,768	0.74% 0.34%	0.93 1.10	0.93 1.10	E F	E F	No No
San Pablo Ave south Ashby Ave	NB SB	2 2	1,177 1,472	18 10	1,195 1,482	1.53% 0.68%	0.74 0.92	0.74 0.92	C E	C E	No No
San Pablo Ave south of Stanford Ave	NB SB	2 2	1,316 1,606	0 0	1,316 1,606	0.00% 0.00%	0.82 1.01	0.82 1.01	D F	D F	No No
Powell Street west of San Pablo Ave	EB WB	2 2	259 717	31 96	290 813	11.97% 13.39%	0.16 0.45	0.18 0.51	A B	A B	No No
Powell Street east of San Pablo Ave	EB WB	2 2	305 896	9 5	314 901	2.95% 0.56%	0.19 0.56	0.20 0.56	A B	A B	No No

Source: Fehr & Peers, 2007.

TABLE 22
MTS ROADWAY SYSTEM ANALYSIS SUMMARY - 2025 PM

Study Segment	Direction	# Lanes	No Project Volume	Project Volume	With Project Volume	Percent Increase	No Project V/C	With Project V/C	No Project LOS	With Project LOS	Impact ?
Freeway Segments											
I-80 North of Ashby Ave	EB WB	4 4	8,898 9,250	44 32	8,942 9,282	0.49% 0.35%	1.11 1.16	1.12 1.16	F F	F F	No No
I-80 North of Powell Street	EB WB	4 5	9,834 10,584	18 60	9,852 10,644	0.18% 0.57%	1.23 1.06	1.23 1.06	F F	F F	No No
I-80 West of I-580	EB WB	5 5	12,479 14,551	17 24	12,496 14,575	0.14% 0.16%	1.25 1.46	1.25 1.46	F F	F F	No No
I -580 East of San Pablo Ave	EB WB	5 5	10,052 8,320	50 70	10,102 8,390	0.50% 0.84%	1.01 0.83	1.01 0.84	F D	F D	No No
I – 880 south of I-80	NB SB	3 4	4,277 5,147	26 18	4,303 5,165	0.61% 0.35%	0.71 0.64	0.72 0.65	C C	C C	No No
I -980 south of SR 24	NB SB	5 4	6,800 3,617	0 0	6,800 3,617	0.00% 0.00%	0.68 0.45	0.68 0.45	C B	C B	No No
Ashby Ave west of San Pablo Ave	EB WB	2 2	1,478 690	4 3	1,482 693	0.27% 0.43%	0.37 0.17	0.37 0.17	B A	B A	No No
Ashby Ave east of San Pablo Ave	EB WB	1 1	1,174 993	5 8	1,179 1,001	0.43% 0.81%	0.59 0.50	0.59 0.50	C B	C B	No No
SR 24 west of Caldecott Tunnel	EB WB	4 4	8,829 4,568	27 37	8,856 4,605	0.31% 0.81%	1.10 0.57	1.11 0.58	F B	F B	No No
Arterials											
San Pablo Ave north Ashby Ave	NB SB	2 2	2,043 2,251	10 14	2,053 2,265	0.49% 0.62%	1.28 1.41	1.28 1.42	F F	F F	No No
San Pablo Ave south Ashby Ave	NB SB	2 2	1,658 1,891	15 22	1,673 1,913	0.90% 1.16%	1.04 1.18	1.05 1.20	F F	F F	No No
San Pablo Ave south of Stanford Ave	NB SB	2 2	1,697 1,973	0 0	1,697 1,973	0.00% 0.00%	1.06 1.23	1.06 1.23	F F	F F	No No
Powell Street west of San Pablo Ave	EB WB	2 2	383 1,031	92 79	475 1,110	24.02% 7.66%	0.24 0.64	0.30 0.69	A C	A C	No No
Powell Street east of San Pablo Ave	EB WB	2 2	437 1,166	13 10	450 1,176	2.97% 0.86%	0.27 0.73	0.28 0.74	A C	A C	No No

Source: Fehr & Peers, 2007.

7. ALTERNATIVE MODES ANALYSIS

This chapter documents the alternative modes analysis which considers project affects to transit, pedestrians and bicycles.

TRANSIT ACCESS AND CIRCULATION

Impacts to transit were identified by estimating additional transit ridership associated with the project to determine if added ridership could be accommodated by the current transit system. A review of the AC Transit publication, *Designing With Transit – Making Transit Integral to East Bay Communities,* was also reviewed to ensure that the proposed project would not conflict with policies. Transit impacts were evaluated with the following criteria:

- Generate added transit ridership that would
  - increase the average ridership on AC Transit lines by five (5) percent at bus stops where the average load factor with the project in place would exceed 125 percent over a peak thirty minute period
  - increase the peak hour average ridership on BART by five (5) percent where the passenger volume would exceed the standing capacity of BART trains
  - increase the peak hour average ridership at a BART station by five (5) percent where average waiting time at fare gates would exceed one minute
- Fundamentally conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle routes)

Ridership Estimates

Transit ridership associated with the project was calculated based on the project vehicle trip generation estimates, as presented in Chapter 3. Trip generation rates for the proposed project were reduced by 5 percent to account for alternative mode use (transit, bicycling, and walking) as well as internal interaction between the residential and commercial portions of the project. Census data indicates that approximately 20 percent of Emeryville residents commute to work via transit. For the residential portion of the project, transit trips were assumed to account for an additional 10 percent of peak hour project trips for the weekday, and 5 percent of additional trips during the Saturday peak hour. For the retail and restaurant portion of the project, transit trips were assumed to account for an additional 5 percent of weekday and Saturday peak hour trips. This equates to about 17 additional AM peak hour transit trips, 31 PM peak hour transit trips, and 47 afternoon peak hour transit trips, as shown on Table 23.

TABLE 23
PEAK-HOUR TRANSIT TRIP GENERATION

Project Component	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Residential Condos/Townhomes	2	12	14	11	6	17	4	4	8
Shopping Center/Restaurant	2	1	3	7	7	14	11	9	20
Total	4	13	17	18	13	31	15	13	28

Source: Fehr & Peers, 2007.

AC Transit routes 57 and Z, and the Emery Go Round Powell route directly serve the project site. AC Transit route Z provides service to Emeryville from San Francisco during the AM peak hour and reverse service during the PM peak hour. Given this, it was assumed that no new transit riders would be added to Route Z from the proposed project. All new riders were equally distributed between AC Transit Route 57 and the Emery Go Round Powell Route. These routes each provide five buses per hour to the project site during the AM and PM peak periods, with AC Transit Route 57 providing 4 buses during the Saturday peak hour, and the Emery Go Round providing 2 buses during the Saturday peak hour. This equates to approximately 2 new riders per bus during the AM peak hour, 3 new riders per bus during the PM peak hour, and 5 new riders per bus during the Saturday peak hour.

Based on information from AC Transit, Route 57 has additional capacity during the peak 30-minute period within the AM, PM and Saturday peak hours, and the additional transit riders would not result in load factors exceeding 125 percent. Emery Go Round buses operate at or over capacity for portions of the route during peak periods and the proposed project could increase transit ridership on the Emery Go Round system. The project applicant should continue contributions to the Emery Go Round system, as currently performed under the Property based Business Improvement District (PBID). Contributions are based on building square footage. Therefore, as development occurs, contributions would increase.

Of the total transit trips, it is assumed that 50 percent of new transit trips would use the BART system at some point during the journey, as both AC Transit Route 57 and the Emery Go Round serve the MacArthur BART station. This equates to 9 new AM, 15 new PM, and 14 new Saturday peak hour riders on the BART system. With over 30 BART trains that pass through the MacArthur station during the AM and PM peak hours and 12 BART trains during the Saturday peak hour, less than one additional rider would be added per train during the weekday and approximately one additional rider per train during the Saturday peak hour. Each BART train has between three and ten cars and each BART car has a capacity of about 70 passengers.

AC Transit Design Guidelines

In 2004, AC Transit published *Designing With Transit – Making Transit Integral to East Bay Communities*. The document is intended to help implement AC Transit Policy 520 (Encouraging the Promotion of Public Transit in Land Use Developments within AC Transit's Service Area), passed by the AC Transit Board of Directors in 1994 and amended in 1997. Policies and Practices are sub-divided into transit-based communities, safe routes to transit and transit friendly streets.

Transit-based communities have high levels of transit, a mixture of uses and a network of safe routes. The proposed project is served by Emery Go Round and AC Transit routes. These bus routes provide access to major employment and commercial centers, residential areas as well as rail transit at the BART and Amtrak stations. The Amtrak station is located on Horton Street at 59th Street with a pedestrian overcrossing providing direct access to the Amtrak station from the site. The project replaces parking facilities and light industrial uses with mixed-use residential and retail, increasing transit ridership opportunities. Given the nearby transit facilities and the proposed uses on the site, the project is consistent with the policies for transit-based communities.

Safe routes to transit consist of an integrated network of sidewalks and paths, maximizing circulation opportunities. The project would maintain the existing pedestrian overcrossing connecting the Amtrak station to the Public Market and pedestrian facilities on Christie Avenue, facilitating transit access to and from the project site for residents, employees and visitors. Therefore, the project is consistent with policies for safe routes to transit.

Transit friendly streets consist of streets that are of appropriate width with adequate turn radii to support buses, where signal timing is supportive of bus operations and traffic calming measures do not interfere with bus operations. Other elements include the placement and design of transit stops, which are preferred at curb-site, not pullouts, stops that are long enough for the buses that use them, bus shelters with appropriate amenities, and sidewalks that are wide enough to support a bus stop. Generally, transit friendly streets surround the project site. The current routing of Route 57 does not contribute to a transit friendly environment around the project site because its layover occurs prior to reaching major transit destinations.

In the study area, Route 57 operates in a clockwise direction on Shellmound Way, Christie Avenue, 64th Street, and Shellmound Street. Currently, buses layover on Christie Avenue, south of 64th Street. A bus layover area is a designed space for bus driver breaks, typically with bathroom accommodations for drivers. The current Route 57 layover occurs prior to reaching major transit destinations, the Amtrak station and main Marketplace entrance, requiring those transit patrons to wait for the duration of the layover prior to reaching their desired destination.

Route 57 should be reoriented through the study area in conjunction with providing a formal layover with bathroom facilities for AC Transit drivers. The proposed routing is shown on Figure 18. A bus layover should be provided on the south side of 64th Street, with bathroom access provided to AC Transit drivers at the proposed retail portion of the 64th & Shellmound building. A bus stop with a pullout on the east side of Shellmound Street, north of the pedestrian crossing, should be provided for northbound buses. A southbound bus stop on the west side of Shellmound Street, south of the Shellmound Street/Marketplace driveway, should be provided.

PEDESTRIAN ACCESS AND CIRCULATION

This section considers off-site pedestrian circulation and access from 64th Street, Shellmound Street and Christie Avenue as well as on-site pedestrian facilities. Sidewalks, crosswalks and walking paths facilitate pedestrian circulation. Recommendations to improve pedestrian both to and around the site are summarized on Figure 19.

Off-Site Pedestrian Facilities

As part of the proposed project, one driveway on Shellmound Street would be eliminated and one driveway would be relocated, reducing the number of driveways on the Shellmound Street project frontage to three. This minimizes the number of conflict points between vehicles and pedestrians. All other existing pedestrian facilities, sidewalks and crosswalks, on the west side of Shellmound Street would be maintained.

Pedestrian access to the Amtrak pedestrian overcrossing would be redirected through the mixed-use Shellmound building. The design of the Shellmound Street building would orient pedestrians from the pedestrian overcrossing to the Shellmound Street mid-block pedestrian crossing, as stairs and an elevator to the pedestrian crossing would be provided at the base of the mid-block crossing. Construction of the Shellmound Building would also increase the high pedestrian traffic across Shellmound Street where protected pedestrian facilities are not provided. Concentrating pedestrian crossing movements through design treatments to the mid-block crossing on Shellmound Street and providing a pedestrian signal at the mid-block Shellmound Street crosswalk would consolidate pedestrian movements and maintain vehicle flows through the corridor. Additionally, sidewalk railing should be constructed to direct pedestrian crossing movements through the mid-block crossing in conjunction with 10-foot sidewalks and appropriate landscaping along Shellmound Street to maintain pedestrian visibility and sight distance.

A diagonal crosswalk is proposed across Shellmound Street at the Woodfin Hotel/Marketplace driveway intersection. The diagonal orientation of the crosswalk increases pedestrian exposure to vehicles. The crosswalk should be reoriented perpendicular to the travel way to reduce pedestrian exposure.

In conjunction with the construction of the 64th & Christie Building, curb bulb-outs are proposed on 64th Street and Christie Street. The purpose of these bulb-outs is threefold: (1) extensions reduce the pedestrian crossing distance, thus reducing pedestrian exposure to traffic; (2) increases pedestrian visibility; and (3) defines and contains the parallel parking on Christie Avenue and 64th Street.

Two driveways, one on 64th Street and one on Christie Street, would provide direct access to the parking areas (surface and structured) for the 64th & Christie Building. No new curb cuts are proposed on either 64th Street or Christie Street.

On-Site Pedestrian Facilities

Current on-site pedestrian amenities include a landscaped path connecting the Marketplace Tower building to the UA Theater building, sidewalks around the northern, eastern and southern building frontage. A breezeway is also provided on the main site between the Marketplace Tower and Marketplace Building, connecting to the sidewalk on the eastern frontage. Additional pedestrian improvements include an additional landscaped path through the parking area connecting the sidewalk along the east side of the Marketplace Tower to the UA Theater. The existing sidewalk on the northern edge of the Marketplace Tower, which is currently not ADA accessible, would be extended, providing a continuous pedestrian connection to the City Park. These improvements facilitate safe and continuous on-site pedestrian paths. Fehr & Peers has identified several locations for improved pedestrian connectivity through the site, as identified on Figure 19 (see also recommendations 16 and 17).

BICYCLE ACCESS AND CIRCULATION

Bicycle circulation encompasses designated bicycle routes as well as other facilities used by bicyclists. A variety of pavement treatments can be used to delineate on-street bike facilities including lane lines to define a bike lane, stencils that indicate bikes are to share the road, and stencils that indicate the general location within the travel way bicycles are to use. Safe facilities are continuous, well delineated with striping and signs, and designed to accommodate the expected bicycle speeds. Class II bicycle facilities (bike lanes) are provided on Shellmound Street in the study area. These lanes would not be removed or altered as part of the project. Additionally, the removal of a curb cut on Shellmound Street would reduce the number of potential vehicle/bicyclist conflict locations. Other regional bicycle facilities, such as the bicycle boulevard on Horton Street can be accessed from the pedestrian overcrossing to the Amtrak station. Access to this pedestrian bridge would be provided through the new Shellmound building. The Shellmound Building elevators proposed to serve the Amtrak pedestrian bridge should be large enough to accommodate bicyclists. Should access to the pedestrian bridge through the Shellmound Building not accommodate bicyclists, increased vehicle/bicycle conflicts could arise as bicyclists use the garage ramping system to access the pedestrian bridge. Bicycle parking is dispersed through the parking areas and may be difficult for a bicyclist to locate, potentially resulting in bicycle parking demand exceeding supply in some areas of the site. As the project is developed, the provision of additional bicycle parking spaces is recommended as demand warrants. Three distinct types of bicycle parking shall be provided: 1) secured bicycle lockers on the upper levels of the garage reserved for resident use only; 2) secured bicycle lockers on the lower levels of the garage for employee parking; and 3) bicycle parking on the ground floor reserved for retail patrons.

TRANSIT, PEDESTRIAN AND BICYCLE RECOMMENDATIONS

The following recommendations should be considered to improve site access and circulation for transit, pedestrians and bicyclists.

- Concentrate pedestrian crossing movements across Shellmound Street through design treatments to the mid-block crossing on Shellmound Street. Provide a pedestrian signal at the mid-block Shellmound Street crosswalk to consolidate pedestrian movements and maintain vehicle flows through the corridor. Additional sidewalk railing should be constructed to direct pedestrian crossing movements through the mid-block crossing. Construct sidewalks a minimum of 10 feet wide and provide appropriate landscaping along Shellmound Street to maintain pedestrian visibility and sight distance.

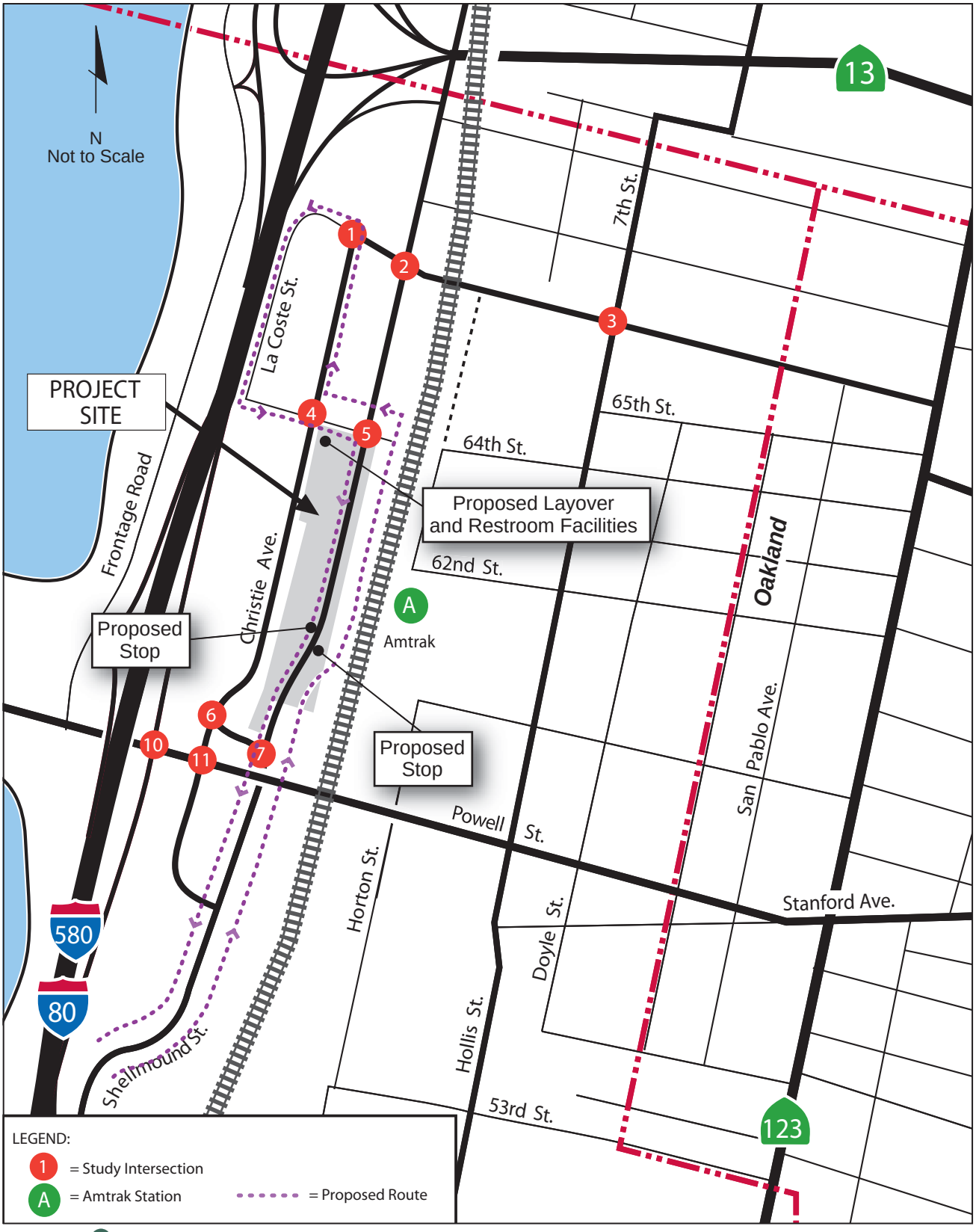
- Reorient the crosswalk perpendicular to the travel way across Shellmound Street at the Woodfin Hotel/Marketplace driveway intersection to reduce pedestrian exposure.

- The project applicant shall continue contributions to the Emery Go Round system, as currently performed under the Property based Business Improvement District (PBID). Contributions are based on building square footage. Therefore, as development occurs, contributions would increase.

- Reorient Route 57 through the study area in conjunction with providing a formal layover with bathroom facilities for AC Transit drivers. The proposed routing is shown on Figure 18. Provide a bus layover on the south side of 64th Street, with bathroom access provided to AC Transit drivers at the proposed retail portion of the 64th & Shellmound building. Provide a bus stop with a pullout on the east side of Shellmound Street, north of the pedestrian crossing, for northbound buses. Provide a southbound bus stop on the west side of Shellmound Street, south of the Shellmound Street/Marketplace driveway.

- The Shellmound Building elevators proposed to serve the Amtrak pedestrian bridge should be large enough to accommodate bicyclists.

- As the project is developed, the provision of additional bicycle parking spaces is recommended as demand warrants. Three distinct types of bicycle parking shall be provided: 1) secured bicycle lockers on the upper levels of the garage reserved for resident use only; 2) secured bicycle lockers on the lower levels of the garage for employee parking; and 3) bicycle parking on the ground floor reserved for retail patrons.



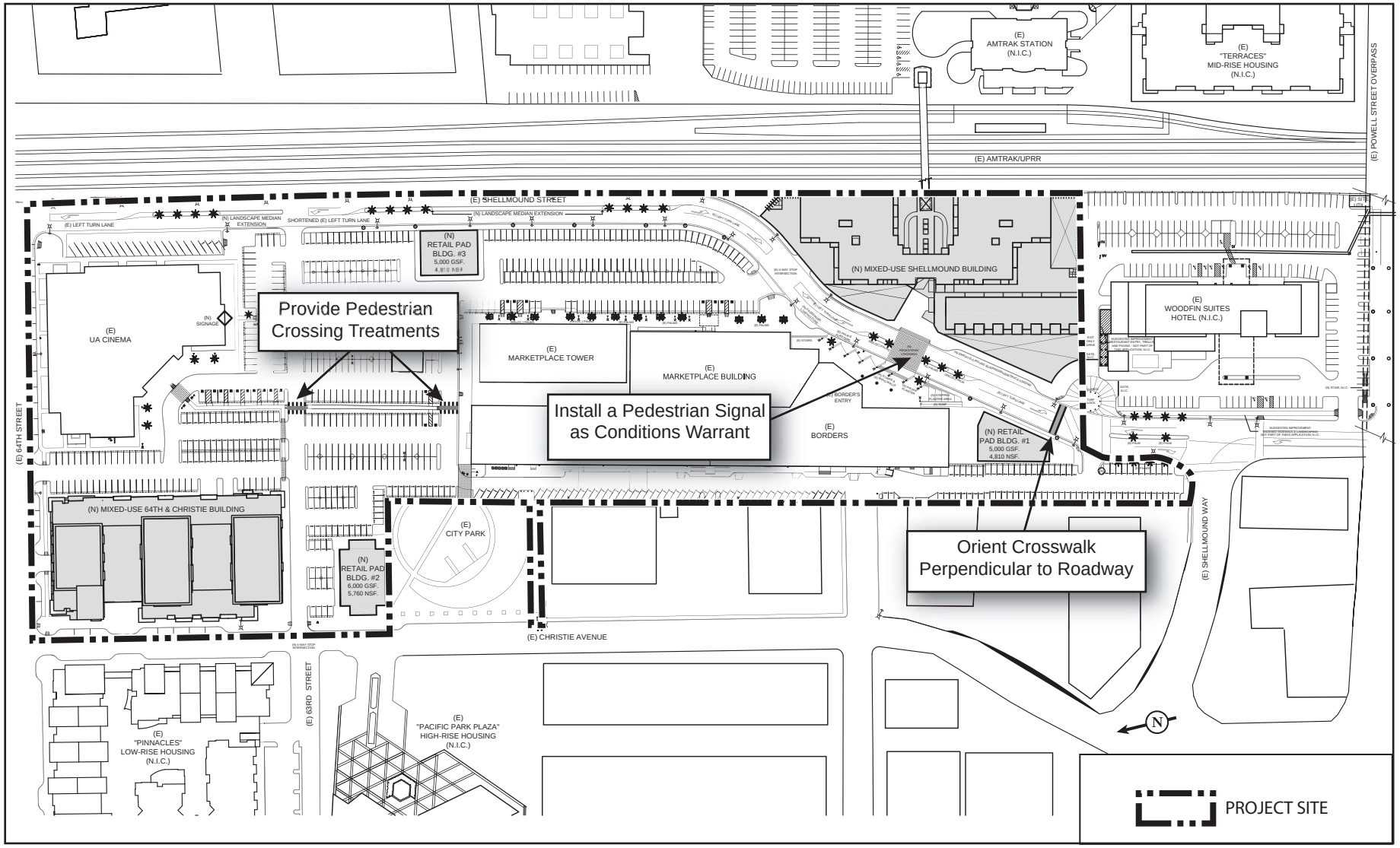
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

AC TRANSIT ROUTE 57 RECOMMENDATIONS

February 2007
Graphics\Feb07 PDFs\WC05-2272_18

FIGURE 18



Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_19

RECOMMENDED PEDESTRIAN ENHANCEMENTS

FIGURE 19

8. VEHICULAR SITE ACCESS, ON-SITE CIRCULATION AND PARKING

This chapter focuses on vehicular site access, on-site circulation and parking. Bicycle and pedestrian access and circulation were discussed in the previous chapter.

SITE ACCESS

Vehicular access to the site would be provided at six locations. A driveway on Christie Avenue that currently serves the site would be realigned opposite a driveway serving the Pacific Park Plaza, and Pinnacles development, which is under construction. This driveway would primarily provide access to the 64th & Christie building, the UA Theater, and the retail pad adjacent to City Park. Two driveways on 64th Street would serve the 64th & Christie building and UA Theater. The first driveway would serve the proposed parking garage of the 64th & Christie building, while the second driveway would serve the UA Theater surface parking area as well as provide access to an on-site garage entry to the 64th & Christie building.

On Shellmound Street, four driveways currently serve the site. The driveway located between the UA Theater entrance and the main Marketplace entrance would be eliminated as part of this project and the northernmost driveway would be shifted south approximately 50 feet, with a corresponding decrease in left-turn pocket length, to align with the driveway on Christie Avenue. The Market Place/Shellmound Building Driveway would remain the same, although it would serve the proposed parking structure on the east side of Shellmound Street. A driveway which provides access to the Woodfin Hotel and parking supplies on the west side of Shellmound Street is located south of the pedestrian crossing on Shellmound Street.

Fehr & Peers evaluated the peak hour operation of the driveways serving the site in both the 2010 and 2030 conditions, assuming full buildout of the project, as presented in Table 24. It should be noted that future vehicle queues for the northbound left-turn pocket at the UA Theater entrance on Shellmound Street would be accommodated within the reduced pocket length. With project buildout in 2010 and 2030, deficient operations are projected at two intersections: Shellmound Street/Shellmound Site Garage Driveway/Marketplace Driveway and Shellmound Street/Woodfin Hotel/Marketplace Driveway. The Shellmound Street/Shellmound Site Garage Driveway/Marketplace Driveway is projected to operate at LOS F during the PM peak hour with all-way stop-control. The side-street at the Shellmound Street/Woodfin Hotel/Marketplace Driveway is projected to operate at a deficient LOS F during the PM peak hour in both 2010 and 2030, although the intersection would operate at an overall acceptable service level. The analysis of Shellmound Street/ Shellmound Site Garage Driveway/Marketplace Driveway and Shellmound Street/Woodfin Hotel/Marketplace Driveway was conducted using the traffic analysis tool SimTraffic which takes into consideration interaction between vehicles and pedestrian movements across Shellmound Street.

Vehicle queue spillback was also evaluated, as presented in Table 25 for 2010 conditions and Table 26 for 2030 conditions both without and with mitigation, for the Shellmound Street/Shellmound Site Garage Driveway/ Marketplace Driveway, Shellmound Street/Pedestrian Crossing and the Shellmound Street/Woodfin Hotel/ Marketplace Driveway intersections. Results of the analysis show that vehicle queue spillback from the Shellmound Street/Shellmound Site Garage Driveway/Marketplace Driveway as well as at the pedestrian crosswalk contribute to unacceptable conditions at the Woodfin Hotel Driveway. The increases in vehicle traffic combined with increased pedestrian activity across Shellmound Street contribute to unacceptable operations on the Shellmound Street corridor along the project's frontage.

TABLE 24
FUTURE PEAK HOUR DRIVEWAY OPERATING CONDITIONS

Intersection	Control[1]	Peak Hour	Future 2010 with Project		Future 2030 with Project	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
64th Street/64th & Christie Garage Driveway	SSSC	AM	2 (9)	A (A)	2 (9)	A (A)
		PM	1 (9)	A (A)	1 (9)	A (A)
		SAT	2 (9)	A (A)	2 (9)	A (A)
64th Street/Existing Driveway	SSSC	AM	1 (9)	A (A)	1 (9)	A (A)
		PM	2 (9)	A (A)	2 (9)	A (A)
		SAT	1 (9)	A (A)	1 (9)	A (A)
Shellmound Street/UA Theater & Marketplace Driveway	SSSC	AM	1 (11)	A (B)	1 (11)	A (B)
		PM	2 (19)	A (C)	2 (22)	A (C)
		SAT	3 (20)	A (C)	3 (34)	A (D)
Shellmound Street/Shellmound Site Garage Driveway/Marketplace Driveway	AWSC	AM	9	A	9	A
		PM	**51**	**F**	**56**	**F**
		SAT	**> 100**	**F**	**> 100**	**F**
Shellmound Street/Woodfin Hotel/ Marketplace Driveway	SSSC	AM	1 (14)	A (B)	2 (15)	A (B)
		PM	**45 (> 100)**	**E (F)**	**55 (> 100)**	**F (F)**
		SAT	**52 (> 100)**	**F (F)**	**>100 (>100)**	**F (F)**
Christie Avenue/Existing Driveway	SSSC	AM	2 (11)	A (B)	2 (12)	A (B)
		PM	2 (14)	A (B)	2 (14)	A (B)
		SAT	3 (12)	A (B)	3 (13)	A (B)

Notes: **Results in bold indicate deficient levels of service.**

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection;
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.

Source: Fehr & Peers, 2007.

TABLE 25
FUTURE 2010 PEAK HOUR DRIVEWAY VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	Maximum Queue Length (in feet) [1]			
			PM		Saturday	
			2010	2010 with Mitigations	2010	2010 with Mitigations
Shellmound Street/ Shellmound Site Garage Driveway/Marketplace Driveway	Northbound left	100	**150**	75	**150**	100
	Northbound through	180	**225**	180	**225**	**200**
	Southbound left	100	**150**	50	150	100
	Southbound through	780	475	125	825	175
	Westbound	215	100	150	275	250
	Eastbound	100	100	100	**150**	**125**
Shellmound Street/ Pedestrian Crossing	Northbound	150	**200**	**200**	**175**	**175**
	Southbound	185	100	175	75	**200**
Shellmound Street/Woodfin Hotel/ Marketplace Driveway	Northbound left	50	**75**	50	**75**	**75**
	Northbound through	95	**125**	**125**	**125**	95
	Southbound left	50	25	25	25	50
	Southbound through	150	150	**175**	125	**200**
	Westbound	155	**200**	155	155	125
	Eastbound	85	50	50	85	25

Notes: 1. Maximum queue in feet as calculated by SimTraffic 6.0.
Source: Fehr & Peers, 2007.

TABLE 26
FUTURE 2030 PEAK HOUR DRIVEWAY VEHICLE QUEUES

Intersection	Movement	Storage Length (in feet)	Maximum Queue Length (in feet) [1]			
			PM		Saturday	
			2030	2030 with Mitigations	2030	2030 with Mitigations
Shellmound Street/ Shellmound Site Garage Driveway/Marketplace Driveway	Northbound left	100	**150**	100	**150**	**125**
	Northbound through	180	**225**	180	**225**	**225**
	Southbound left	100	**150**	100	**150**	**125**
	Southbound through	780	550	175	**825**	775
	Westbound	215	100	175	**275**	**275**
	Eastbound	100	100	100	**125**	**125**
Shellmound Street/ Pedestrian Crossing	Northbound	150	**200**	**175**	**175**	**200**
	Southbound	185	75	185	75	**225**
Shellmound Street/Woodfin Hotel/ Marketplace Driveway	Northbound left	50	**75**	50	**75**	**75**
	Northbound through	95	**125**	95	**125**	**125**
	Southbound left	50	25	25	25	50
	Southbound through	150	150	**175**	150	**200**
	Westbound	155	**200**	155	**175**	**200**
	Eastbound	85	75	50	85	**125**

Notes: 1. Maximum queue in feet as calculated by SimTraffic 6.0.
Source: Fehr & Peers, 2007.

Impact Statement 14: The addition of project traffic would result in deficient LOS F operations at the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway intersection as well as at the Woodfin Hotel driveway with buildout of the project parcels on the west side of Shellmound Street. This is a potentially ***significant impact***.

Mitigation Measure 14: In conjunction with construction on the Shellmound site, a traffic signal shall be installed at the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway intersection. The driveways shall be modified to provide sufficient vehicle storage to minimize vehicle queue spill back from impeding on-site circulation. Implementation of this measure would result in acceptable service levels during the peak hours. However, the 95th percentile queue for the northbound movements would periodically spillback through the pedestrian crossing and from the pedestrian crossing through the Woodfin Driveway, and Shellmound Way. Minimizing the effect of queue spillback could be achieved through monitoring of the signal timings. It should be noted that the Shellmound Street corridor from Shellmound Way through the Marketplace Driveway would operate better in the mitigated scenario than the unmitigated scenario even though vehicle queues would periodically spill back through the corridor, resulting in a ***significant and unavoidable*** queuing impact on the Shellmound Street corridor.

Impact Statement 15: The addition of project traffic would worsen side street operations at the Shellmound Street/Woodfin Hotel/Marketplace Driveway intersection to LOS F with buildout of the project. This is a potentially ***significant impact***.

Mitigation Measure 15: The driveway serving the Woodfin Hotel cannot accommodate significant additional traffic flows. It is recommended that the parking area serving the new land uses on the Shellmound site be designed to orient the majority of outbound traffic, about 80 percent, away from the shared driveway. Alternatively, this driveway could be restricted right-in/right-out operation. With right-in/right-out operation, the worst movement would operate at LOS C and the intersection would operate at an overall LOS A during both the weekday PM and Saturday afternoon peak hours. However, restricting access to this parcel could potentially create circuitous travel through the area, and would reduce access to/from the Woodfin Hotel. Therefore, access restrictions are not recommended, resulting in a ***significant and unavoidable*** impact.

Impact Statement 16: Vehicle queues at the pedestrian crossing are expected to increase as pedestrian activity increases around the project site. This queuing contributes to deficient operations at the Shellmound Street/Woodfin Hotel/Marketplace Driveway and the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway. This is a potentially ***significant impact***.

Mitigation Measure 16: Install a pedestrian signal at the pedestrian crossing on Shellmound Street. Through design treatments, such as sidewalk railings and landscaping, consolidate pedestrian activity from the Shellmound Street/Woodfin Hotel/Marketplace Driveway and the Shellmound Street/Marketplace Driveway/Shellmound Garage driveway to the pedestrian crossing. The pedestrian signal shall be interconnected and coordinated with the signal at the Shellmound Street/Shellmound Way intersection and the Shellmound Street/Marketplace Driveway/Shellmound Garage intersection. It should be noted that the Shellmound Street corridor from Shellmound Way through the Marketplace Driveway would operate better in the mitigated scenario than the unmitigated scenario even though vehicle queues would periodically spill back through the corridor, resulting in a ***significant and unavoidable*** queuing impact on the Shellmound Street corridor. However, the installation of a pedestrian signal would improve pedestrian safety across Shellmound Street as traffic volumes increase through the corridor, reducing the pedestrian impact to a ***less-than-significant*** level.

ON-SITE CIRCULATION

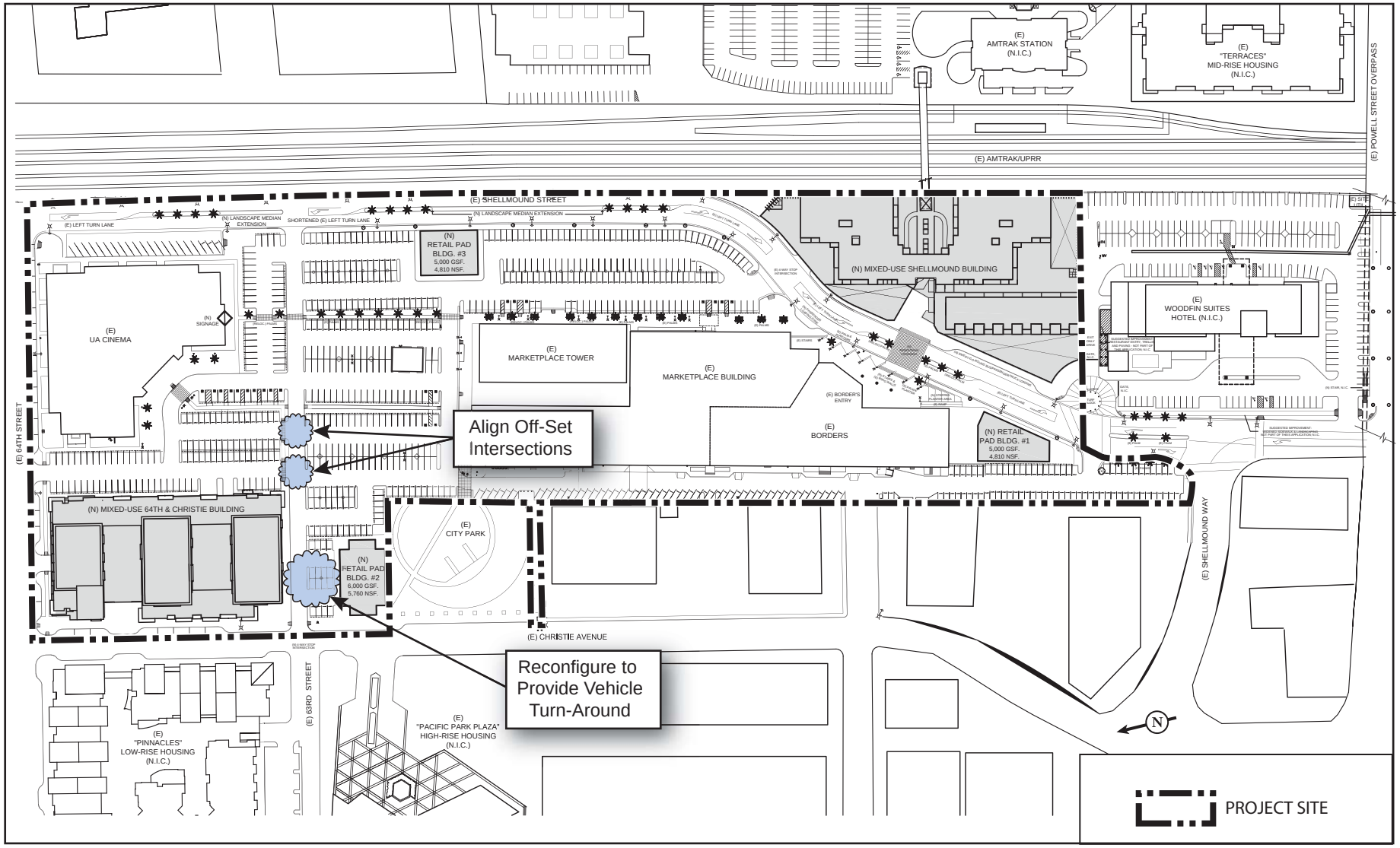
On-site circulation for the surface parking area and parking structures were reviewed. Recommendations to improve on-site circulation are summarized on Figure 14.

Surface Parking Lot

Drive Aisles

Two east-west drive aisles would be provided. The northernmost east-west drive aisle connects Shellmound Street with Christie Avenue. The second east-west drive aisle is located approximately 200 feet south of the northernmost east-west drive aisle. Both aisles are at least 22 feet wide, the minimum drive aisle width allowed by the City of Emeryville. Parking is not provided on either east-west drive aisle.

Six north-south aisles would be provided, all of which provide access to parking. The aisles are at least 22 feet wide, the minimum drive aisle width allowed by the City of Emeryville. The intersections of two north-south aisles (as illustrated on Figure 20) across the northernmost east-west driveway are off-set, creating a potentially confusing intersection.



Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_20

ON-SITE CIRCULATION RECOMMENDATIONS

FIGURE 20

Dead End Drive Aisles

Dead end drive aisles are parking aisles obstructed at one end, thereby increasing navigational difficultly through the drive aisles. Two dead end drive aisles adjacent to the retail pad #2 (adjacent to City Park) are proposed, serving approximately 20 parking spaces. As the depth of these parking areas is approximately 35 feet, vehicles wanting to park in this area would be able to see if spaces were available. However, it appears that vehicles parked in the last stall of each row could have difficultly exiting the space, especially if an oversized vehicle is parked in the opposite stall. Vehicles parked in the dead end drive aisles adjacent to retail pad #2 could have difficultly exiting the space. Reconfigure the parking area adjacent to the retail pad #2 to provide sufficient space for vehicles to back out of the last spaces in each row.

Vehicle/Pedestrian Conflicts

Locations of vehicle and pedestrian conflicts were discussed in the pedestrian circulation section and recommendations to increase pedestrian visibility and reduce vehicle/pedestrian conflicts were summarized on Figure 13.

Dimensions of Parking Spaces

The City of Emeryville municipal code provides guidelines for parking space dimensions (9-4.55.7). Standard perpendicular parking stalls for retail uses should be 8 and 1/2 feet wide by 18 feet long, with 8 feet of overhead clearance (for stalls within a garage). Compact stalls can be 7 and 1/2 feet wide by 16 feet long. When a vehicle overhang is provided, parking stall lengths can be reduced by 2 feet. Parking stalls throughout the surface parking area conform to these standards. For residential uses, parking stalls should be 9 feet wide and 18 feet long.

Delivery Vehicles

Insufficient detail is provided on the site plan to evaluate delivery vehicle access. However, based on City Code requirements (9-4.55.8), no formal loading area would be required for the three proposed retail pads, or the 64th & Shellmound retail. Two loading spaces would potentially be required on the Shellmound site. Additionally, deliveries and garbage collection should be scheduled for off-peak times to minimize potential conflicts. Insufficient detail is provided to evaluate delivery vehicle access. Delivery vehicle access should be reviewed prior to approval of the final site plan.

Parking Structure Design

This parking structure design review includes the 64th & Christie building and Shellmound Building parking structures. It considers consistency with accepted design standards for parking structures as well as a qualitative review of the circulation plan to identify potential conflict locations. Design standards for parking are set by the *City of Emeryville Municipal Code* in section 9-4.55.7. Generally, parking stall and drive aisle dimensions in the proposed garages meet City standards. However, stalls in the resident only areas of the 64th & Christie building and Shellmound buildings garages are designated as compact stalls. The minimum dimensions of an assigned resident stall are 9 feet wide by 18 feet long. Although City Code does permit some compact stalls in residential developments, residents assigned to a compact space may not have a compact vehicle, impeding vehicle circulation through the lot. Assigned resident parking stalls should be redesigned to meet standard City dimensions.

In a parking structure, the maximum permitted ramp slope is 20 percent. Should a ramp slope exceed 10 percent, transitions between ramp and floor of at least eight feet in length are recommended. Ramp slopes in the Shellmound garage do not exceed 5 percent. The ramp slope in the 64th & Christie building are not provided on the site plan. Insufficient detail is provided on the site plan to evaluate the ramping system of the 64th & Christie building garage. The ramping system of the 64th & Christie building garage should be reviewed during permit approval to ensure compliance with City of Emeryville design guidelines.

Circulation and parking stall designations were also reviewed for both structures.

64th & Christie building Parking Structure

The 64th Street and Christie Avenue Building parking structure would provide approximately 286 spaces to serve 180 residential units and 6,000 square feet of retail. Of the parking spaces, approximately 221 would be reserved for resident use (with 72 tandem spaces) as required by City Code, with the remaining spaces shared between retail and resident guest parking. Tandem parking spaces are shown on the parking garage layout. These spaces must be designated as reserved resident spaces, assigned to the same unit.

The spaces available for retail and guest parking are located on the lower garage level and are proposed to be separated from reserved residential spaces by a gate system. Operations of the gate system separating the open parking from reserved parking could be impeded by improperly parked or oversized vehicles. Designing the parking garage with roll up gates could reduce the interference of an improperly parked or oversized vehicle with the function of a swinging or sliding gate.

The parking aisles provided for retail/guest parking terminate at the residential gates, creating a dead-end drive aisle with no vehicle turn around. This can create difficulties for vehicles navigating the garage. The proposed location of the residential gates creates dead-end drive aisles with no vehicle turn around provided. Additionally, vehicles parked in spaces adjacent to the gates would have difficulties exiting the parking space. Relocating the residential gates to minimize dead-end drive aisles or provide sufficient space for a vehicle turn around would minimize parking difficulties.

Shellmound Building Parking Structure

The Shellmound Building Parking Structure is a 3-level parking structure with a total of 540 spaces including retail and residential parking. Full vehicular access to the parking structure is provided on the first level on Shellmound Street at the main Marketplace entry. A separate exit only driveway, connecting to the Woodfin Suites parking lot, is located on the south side of the structure. Upon entry into the Shellmound building garage, access to two aisles is immediately provided, creating a confusing intersection where vehicle conflicts would occur. This area should be redesigned to reduce vehicle conflicts.

With buildout of the proposed project, a traffic signal would be warranted at the Shellmound Street/Shellmound Site Garage Driveway/Marketplace Driveway intersection. With installation of a traffic signal, the design of the garage entrance would not provide sufficient vehicle storage to ensure efficient signal operations.

> ***Impact Statement 17:*** With signalization of the Shellmound Street/Shellmound Site Garage Driveway/Marketplace Driveway intersection, the design of the garage entry would not provide sufficient vehicle storage. Additionally, as vehicles queue internally, access to parking areas could be blocked, creating the potential for vehicle queues onto Shellmound Street. This is a potentially ***significant impact***.

Mitigation Measure 17: Redesign the Shellmound building garage entrance area to minimize vehicle conflicts and provide sufficient vehicle storage at the access intersection. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

The parking aisles provided for retail/guest parking terminate at the residential gates, creating a dead-end drive aisle with no vehicle turn around. This can create difficulties for vehicles navigating the garage. Relocating the residential gates to minimize dead-end drive aisles or provide sufficient space for a vehicle turn around would minimize navigational difficulties.

On the third parking level, several parking stalls are provided adjacent to a wall, with no space provided for a vehicle to back-out of the stall. This parking area should be reconfigured to provide sufficient space for vehicles to back out of the last spaces in each row.

Bicycle parking cages are located on all three levels of the parking structure. To access bicycle parking cages on the second and third levels, bicycles would circulate through the garage, increasing conflicts between the various modes of transportation, as noted in the bicycle circulation discussion. Bicycle spaces on the upper levels should be reserved for resident use and located adjacent to the elevator system.

PARKING SUPPLY AND DEMAND

At project buildout a total of 1,516 on-site parking spaces would be provided in surface and structured parking for the Marketplace site and Shellmound building. This represents an increase of 449 spaces over the current supply of 1,067 spaces. An additional 286 structured parking spaces would be constructed for the 64th & Christie building. The proposed on-site parking supply was compared to both City Code parking requirements and ITE parking demand rates. Additionally, parking demand/supply during the construction phase of the project was also reviewed.

City Code

City Code parking requirements were reviewed to ensure that the proposed project provides sufficient parking for the new project uses. The City of Emeryville requires:

- One reserved resident space for every studio and one bedroom residential unit
- One and one-half reserved resident space for every two and three bedroom residential unit
- One-quarter guest space for every unit
- One space for every 250 square feet of regional retail
- One space for every 333 square feet of local retail

A reduction in the building square-footage used to calculate parking of up to 20 percent is allowed to account for non-usable interior area and common areas. As shown in Table 27, sufficient parking would be provided to satisfy code requirements for project uses.

TABLE 27
CITY CODE AUTOMOBILE PARKING REQUIREMENTS

Land Use Type	Size	Parking Code Requirement[1]	Parking Spaces Required
Marketplace Site			
Shellmound Building			
Reserved Residential Spaces	39 – Studio Units	1.0 per unit	39
	87 - 1 Bedroom Units	1.0 per unit	87
	25 - 2 Bedroom units	1.5 per unit	38
	9 - 3 Bedroom Units	1.5 per unit	14
Guest Spaces	160 residential units	0.25 per unit	40
Regional Retail	55,000 square feet	1 per 250 square feet	176
		Subtotal	394
Outpads			
Size of all three outpads combined not to exceed	16,000 square feet	1 per 333 square feet	38
Existing Uses			
Marketplace Office Tower Public Market Buildings UA Theater Woodfin Hotel			1,067
		Total Required Marketplace Site	**1,499**
		Total Provided	**1,516**
		Surplus/(Deficit)	**17**
64th & Christie Building			
Residential	98 - 1 Bedroom Units	1.0 per unit	98
	82 - 2 Bedroom units	1.5 per unit	123
Guest Spaces	180 residential units	0.25 per unit	45
Retail	6,000 square feet	1 per 333 square feet	14
		Total Parking Required	**280**
		Total Provided	**286**
		Surplus/(Deficit)	**6**

Notes: [1] Parking requirements calculated from maximum building size reduced by 20 percent to account for non-usable areas.
Source: City of Emeryville Municipal Code 9-4.55.5(a).

Shared Parking Analysis

Current tenants of the Marketplace site, as well as the Woodfin Hotel, have an existing shared parking agreement. Shared parking on the site would continue to occur with additional development on the site and the Shellmound site (the 64th & Christie site would provide all its required parking on site and would not share parking with the Marketplace site). Therefore, a shared parking analysis was completed to determine if sufficient parking would be provided on the Marketplace site to accommodate existing demand, as well as future demand, at project buildout.

Existing weekday and weekend parking demand for the Marketplace site were documented by Watry Design, Inc in their letter dated October 5, 2005 (copy provided in Appendix D). That study showed maximum observed parking occupancies of 65 percent. Parking demand rates, as presented in ITE's *Parking Generation* (3rd Edition), the Urban Land Institute publication *Shared Parking* (2nd Edition), and City of Emeryville parking code requirements were used to estimate peak parking demands for the Marketplace portion of the Project. Existing parking demand for the site, which includes hotel, retail, restaurant, office and theater uses, was compared to the theoretical demand for site calculated from information contained in the aforementioned publications. Adjustments to the base demand rates were made so that the calculated peak demand coincided with actual observed peak demand, resulting in a weekday retail/restaurant demand rate of 2.95 and a weekend demand rate of 3.52 spaces per 1,000 square feet. The calculated rates for the existing retail/restaurant were used to estimate peak parking demand for the retail portions of the project. Emeryville City Code requirements were used for the residential portion of the project, as parking spaces would generally be assigned to each unit. Monthly and hourly adjustment factors were applied to the calculated maximum demand rates to develop hourly parking demand for each use on the Marketplace site (existing and proposed).

The results are summarized on Figure 21 for weekends in June and Figure 22 for weekdays in June. June was selected as the analysis month as existing parking demand data was collected during this month. Results of the analysis show that proposed parking supplies would be sufficient to accommodate future parking demand. On a Saturday in June, the maximum demand is projected to be 1,214 spaces, which represents a parking occupancy of 80 percent, or a twenty percent surplus. On a Weekday in June, the maximum demand is projected to be 1,074 spaces, which represents a 71 percent occupancy rate, or a 29 percent surplus. For a mixed-use project a surplus of about 15 percent is desirable to limit the amount of circulation through the site. Additionally, as parking supplies would be located throughout the site, it is recommended that a parking space counting system be installed at the garage to minimize circulation throughout the garage.

Parking during Construction

As businesses are in operation on the Marketplace site, adequate parking supplies must be maintained during the project construction period. Based on parking surveys conducted by Watry Design, Inc., excess parking is currently available on the site during peak parking periods. The current supply is 1,067 spaces, with an observed maximum occupancy of approximately 65 percent. It is assumed that parking demand would generally not increase during the construction period.

Prior to the start of construction on the site, the parking lot on the Marketplace site would be configured to provide an additional 183 parking spaces. Additionally, valet parking would be in place providing an additional 162 spaces. Construction on the Shellmound site would require the removal of 251 parking spaces. Construction of retail pad #2, adjacent to City Park, requires the permanent removal of 28 parking spaces. Up to 20 additional spaces adjacent to retail pad #2 may be used for construction staging. With construction of retail pad #3, adjacent to Shellmound Street, approximately 33 spaces would be permanently removed, with up to 20 additional spaces used for construction staging purposes. No existing marketplace parking supplies would be removed with construction of the 64th & Christie building or retail pad #1, adjacent to Boarders. Assuming all portions of the project are constructed concurrently, approximately 1,060 parking spaces would be available during the construction period. As existing parking demand is much less than current supply, reflecting the mixed-use nature of the proposed project, the loss of 7 spaces during the construction period is not considered significant. Therefore, the impact to parking during the construction period would be less-than-significant impact.

SUMMARY OF VEHICULAR SITE ACCESS, ON-SITE CIRCULATION AND PARKING RECOMMENDATIONS

The following summarizes vehicular site access, circulation and parking recommendations for the proposed project:

- Reconfigure the parking area adjacent to the retail pad #2 to provide sufficient space for vehicles to back out of the last spaces in each row
- Review delivery vehicle access prior to approval of the final site plan
- Redesign assigned resident parking stalls to meet standard City dimensions
- Review the ramping system of the 64th & Christie building garage during permit approval to ensure compliance with City of Emeryville design guidelines
- Design the 64th & Christie building parking garage with roll up gates as an improperly parked or oversized vehicle could interfere with the function of a swinging or sliding gate
- Relocate the residential gates in the 64th & Christie building garage to minimize dead-end drive aisles or provide sufficient space for a vehicle turn around
- Redesign the entry on of the Shellmound building garage on Shellmound Street to eliminate conflicts at the entry intersection
- Relocate the residential gates in the Shellmound building garage to minimize dead-end drive aisles or provide sufficient space for a vehicle turn around
- Install a parking space counting system at the Shellmound building garage to minimize excessive circulation through the site
- On the third parking level of the Shellmound building garage, redesign the parking stalls adjacent to a wall to provide sufficient space for vehicles to back out of the last spaces in each row

Figure 21
Weekend Shared Parking Demand Analysis

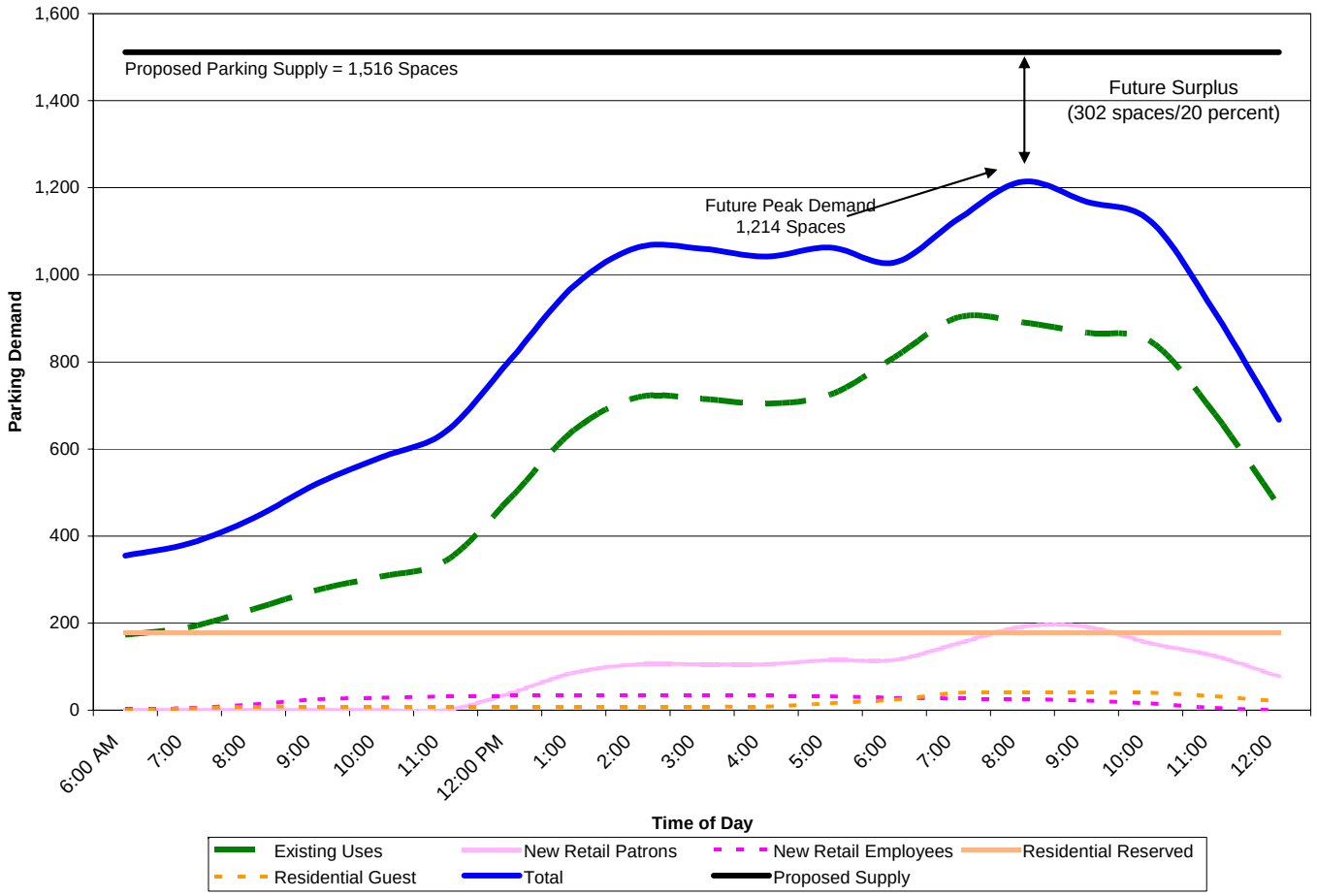
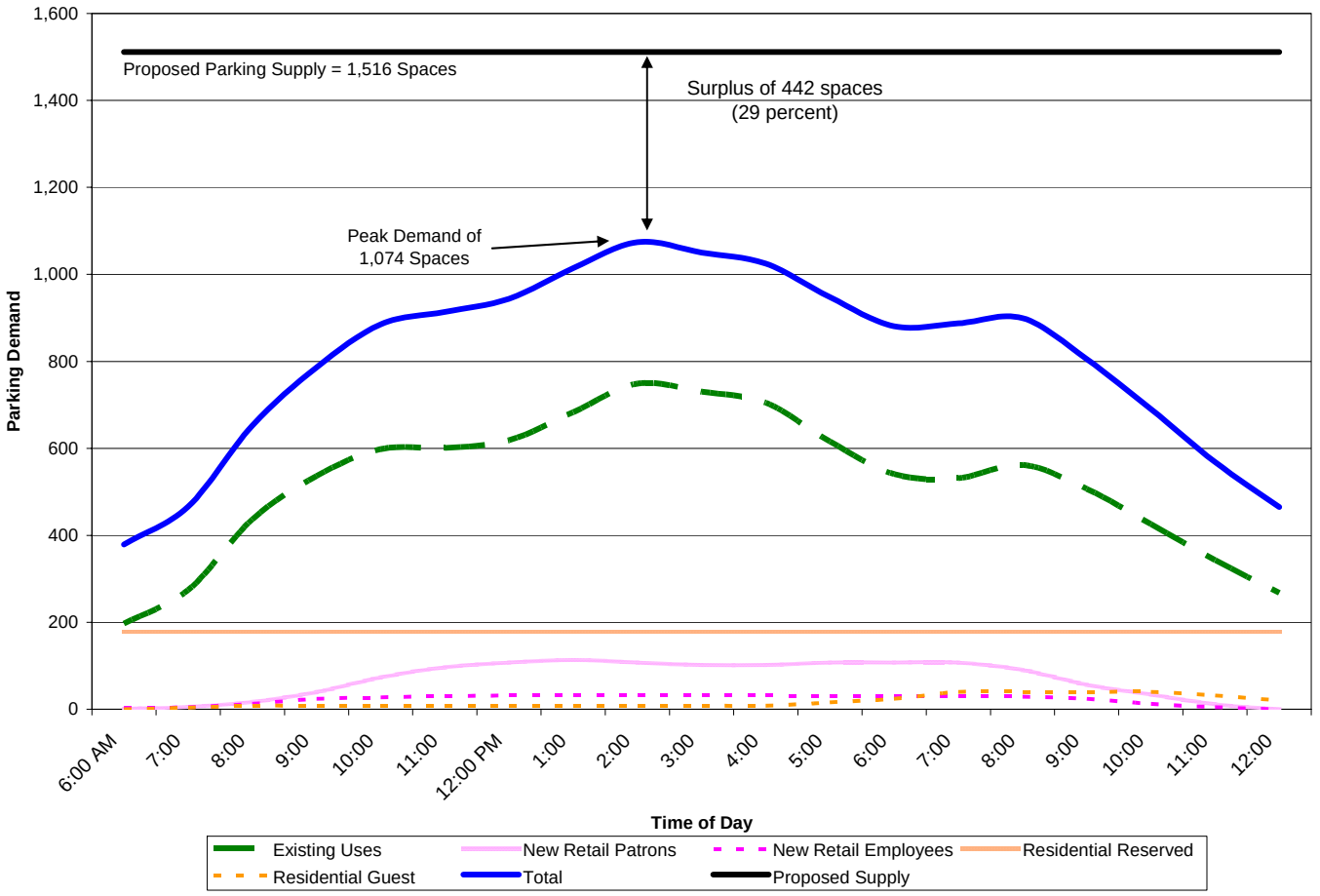


Figure 22
Weekday Shared Parking Demand Analysis



FEHR & PEERS
TRANSPORTATION CONSULTANTS

9. ALTERNATIVES ANALYSIS

This chapter evaluates the Alternatives to the proposed Project.

DESCRIPTION OF ALTERNATIVES

Four alternatives to the Project were evaluated, as described below.

Alternative 1 – No project

Under the "no project" alternative, no development would occur. The site would remain as it is today.

Alternative 2 – Reduced Project

The reduced project alternative would reduce the number of housing units, reduce the amount of retail space, and develop office uses. The reduced project components are listed below:

- 140 dwelling units
- 157,000 square feet of office space
- 28,560 square feet of retail space
- 5,040 Square feet of restaurant space

The size of the Shellmound Building would be reduced and additional surface level parking would be provided, as shown on Figure 23.

Alternative 3 – Tower

The Tower alternative would increase the number of housing units and increase the amount of retail space. The Tower alternative components are listed below:

- 388 dwelling units
- 211,960 square feet of retail space
- 37,410 square feet of restaurant space

This alternative assumes redevelopment of the UA Theater site with additional retail/restaurant uses, as shown on Figure 24.

Alternative 4 – Main Street

The Main Street alternative would increase the number of housing units, increase the amount of retail space, and develop office uses.

- 388 dwelling units
- 415,000 square feet of office space
- 179,360 square feet of retail space
- 31,640 square feet of restaurant space

This alternative also assumes the redevelopment of the UA Theater Site. Shellmound Street would also be realigned through the existing Marketplace parking lot, connecting to its existing alignment approximately 350 feet south of 64th Street as part of this alternative, as shown on Figure 28.

TRIP GENERATION COMPARISONS

Trip generation estimates for the proposed Project and Project Alternatives are presented in Table 25, with detailed trip generation tables provided in Appendix F. Project Alternative 1 would not generate any additional trips for the site. Project Alternative 2 would generate more AM peak hour trips, due to the addition of the office component. PM and Saturday peak hour trip generation would decrease with Alternative 2; however, in the PM peak hour the amount outbound traffic would increase as compared to the proposed project, due to the addition of the office component whose PM peak hour trip generation is mostly outbound trips. Project Alternative 3 would almost triple the AM and Saturday peak hour vehicle trip generation as compared to the proposed project, and double PM peak hour trip generation. Project Alternative 4 would result in a 5 fold increase in AM peak hour trip generation and triple PM and Saturday trip generation.

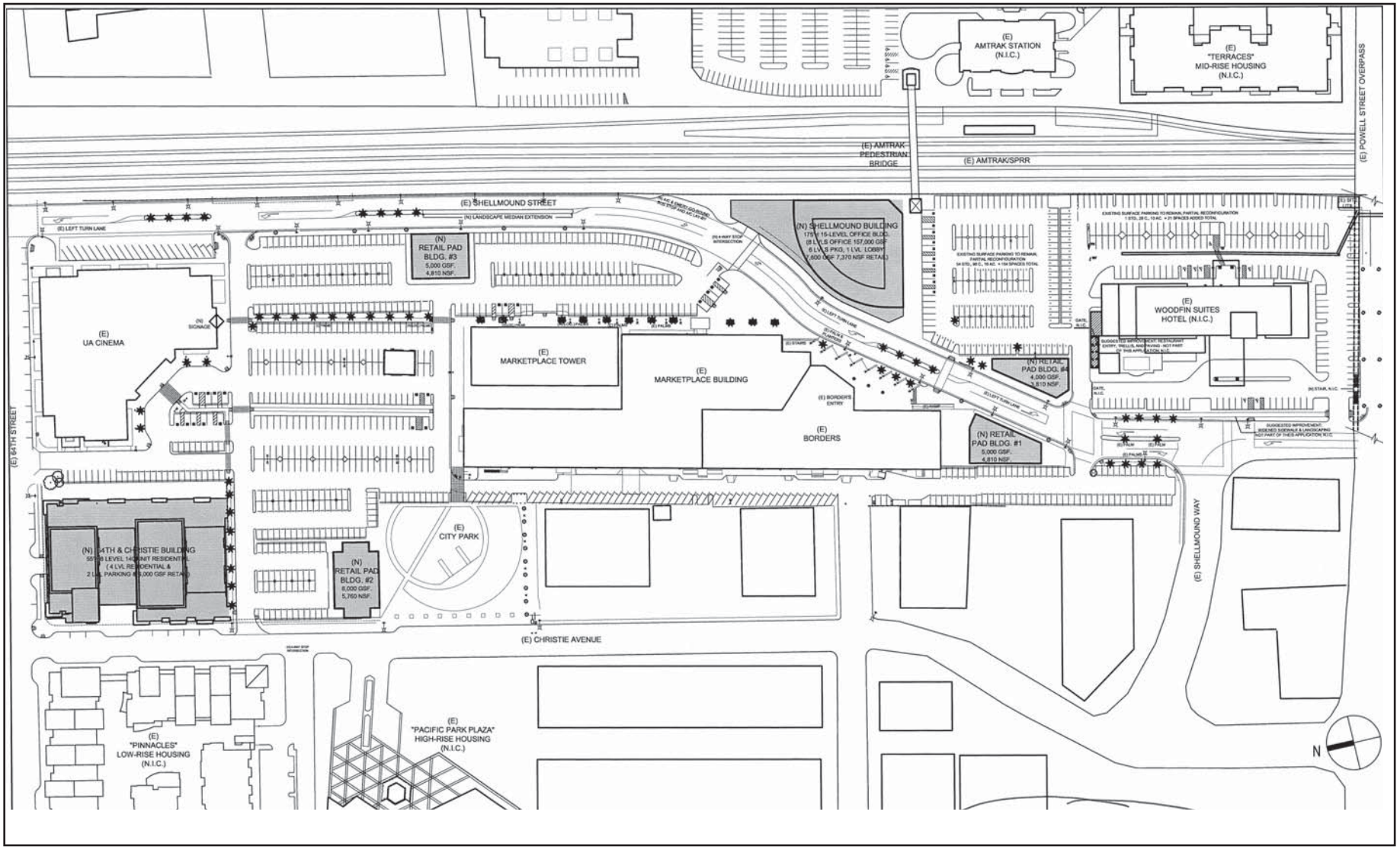
TABLE 28
PROJECT ALTERNATIVE
TRIP GENERATION COMPARISON

Project Alternative	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Proposed Project	71	148	219	261	198	459	298	246	544
Project Alternative 1	0	0	0	0	0	0	0	0	0
Project Alternative 2	247	103	350	136	256	392	164	134	298
Project Alternative 3	282	334	616	523	429	952	806	648	1,454
Project Alternative 4	776	379	1,155	564	863	1,427	783	635	1,418

Source: Fehr & Peers, 2007.

LEVEL OF SERVICE SUMMARY

Operations at the study intersections were evaluated using the same level of service calculations discussed previously. Results of the analysis are presented in Table 29 for the Existing condition, Table 30 for the 2010 condition and Table 31 for the 2030 condition. Table 32 summaries the significant impacts of each project alternative for locations where at least one Project alternative would result in a significant impact. A level of service summary table for all study intersections is provided in Appendix F.



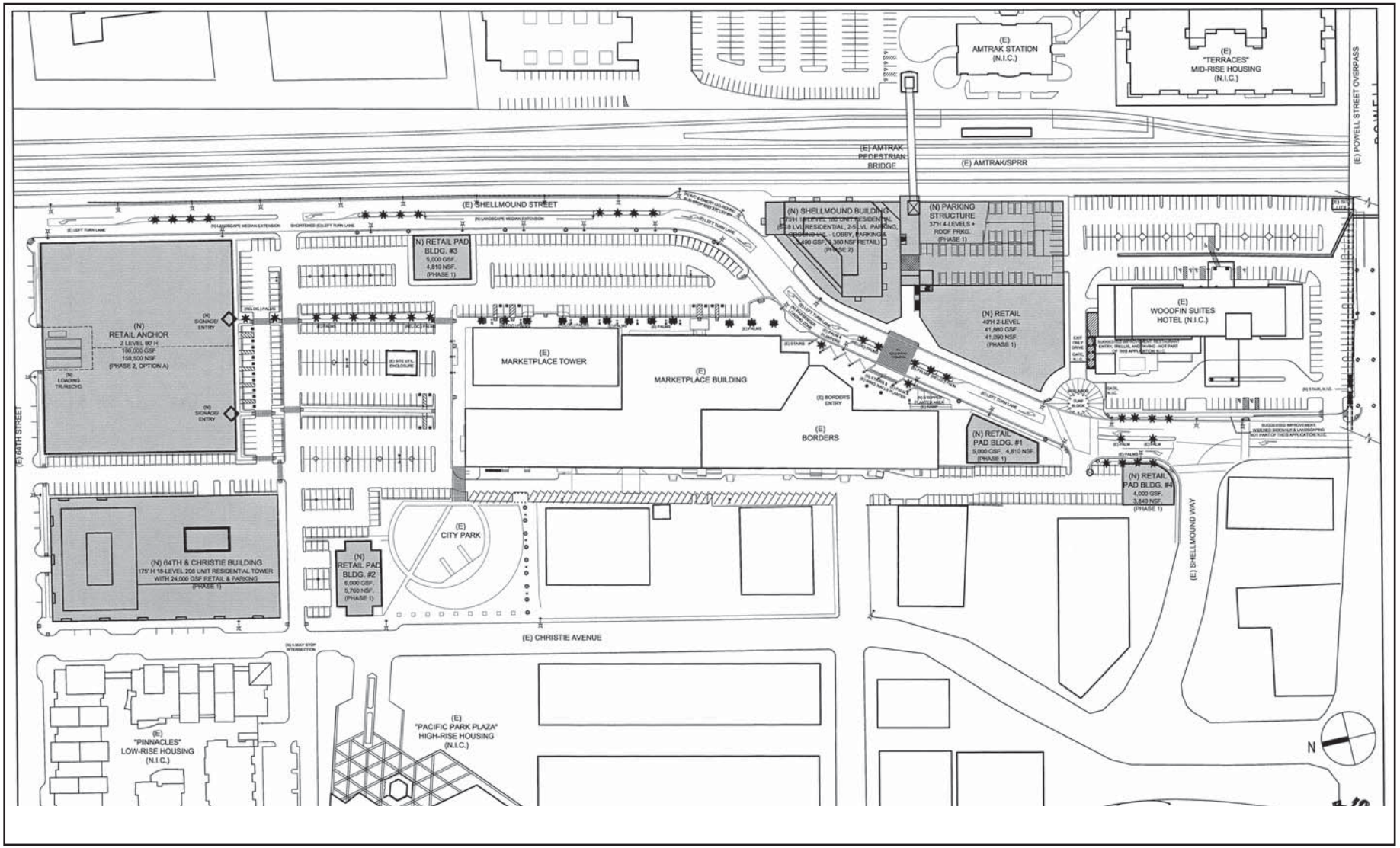
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_23

CONCEPTUAL PROJECT SITE PLAN
REDUCED PROJECT ALTERNATIVE

FIGURE 23



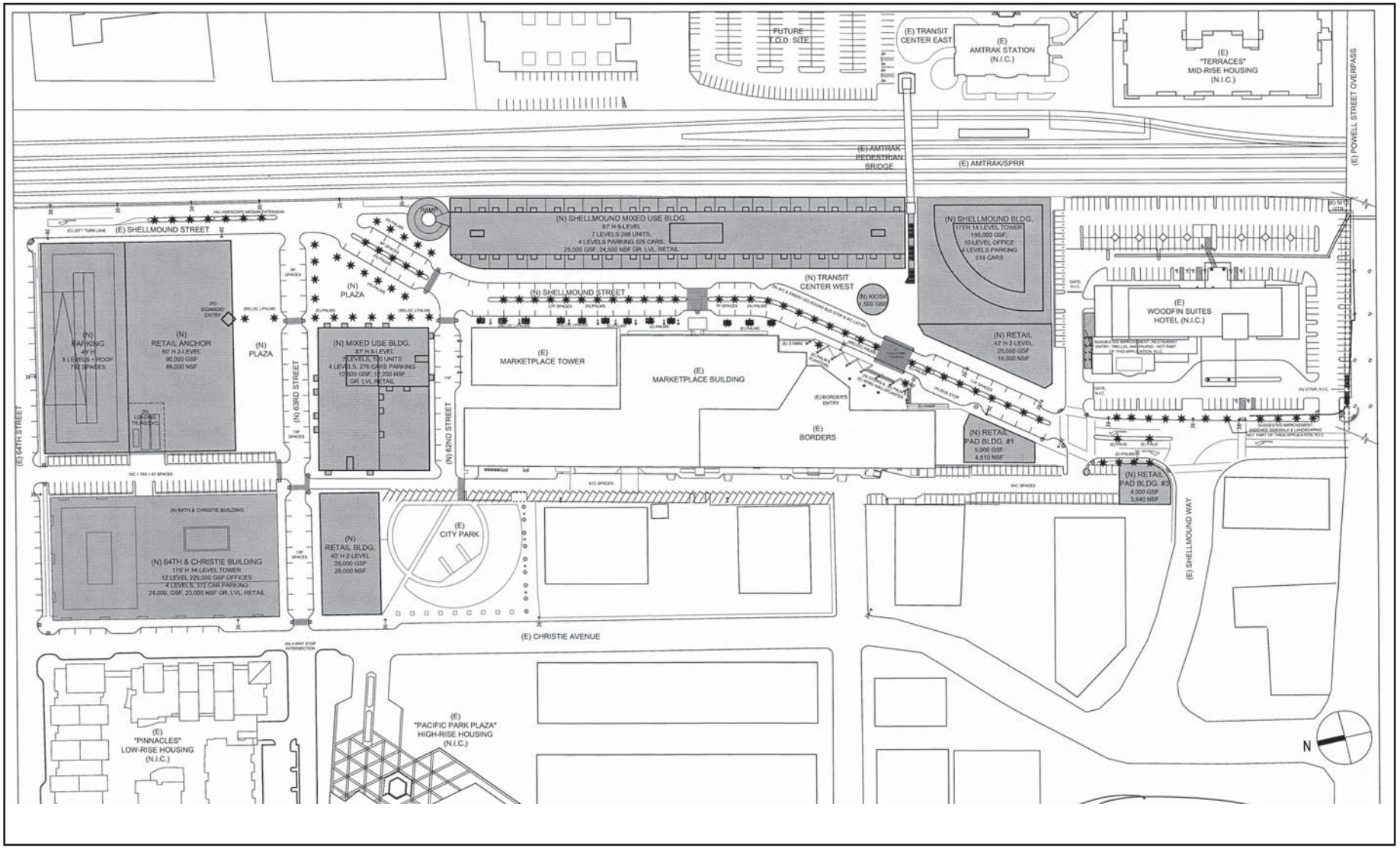
Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2007
Graphics\Feb07 PDFs\WC05-2272_24

CONCEPTUAL PROJECT SITE PLAN TOWER ALTERNATIVE

FIGURE 24



Marketplace Redevelopment EIR

FEHR & PEERS
TRANSPORTATION CONSULTANTS

CONCEPTUAL PROJECT SITE PLAN
MAIN STREET ALTERNATIVE

FIGURE 25

February 2007
Graphics\Feb07 PDFs\WC05-2272_25

TABLE 29
EXISTING CONDITIONS PEAK HOUR INTERSECTION OPERATING CONDITIONS WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
Ashby Avenue/San Pablo Avenue	Signal	AM	32	C	33	C	33	C	36	D	34	C
		PM	40	D	42	D	42	D	44	D	44	D
65th Street/Shellmound Street	AWSC	AM	9	A	10	A	9	A	11	B	15	B
		PM	50	E	***72***	***F***	***81***	***F***	***113***	***F***	***164***	***F***
		SAT	29	D	***53***	***F***	***41***	***E***	***135***	***F***	***122***	***F***
64th Street/Shellmound Street	SSSC	AM	1 (10)	A (A)	2 (11)	A (B)	2 (11)	A (B)	2 (12)	A (B)	2 (14)	A (B)
		PM	2 (16)	A (C)	2 (19)	A (C)	2 (19)	A (C)	4 (34)	A (D)	7 (49)	A (E)
		SAT	1 (16)	A (C)	2 (21)	A (C)	1 (19)	A (C)	9 (86)	A (F)	5 (55)	A (F)
I-80 Hook Ramps/Frontage Road	Signal	AM	15	B	15	B	15	B	15	B	15	B
		PM	37	D	38	D	37	D	40	D	44	D
		SAT	16	B	16	B	16	B	18	B	18	B
Powell Street/I-80 Eastbound Ramps	Signal	AM	26	C	27	C	31	C	28	C	37	D
		PM	73	E	***83***	***F***	***80***	***F***	***88***	***F***	***115***	***F***
		SAT	56	E	***62***	***E***	58	E	***66***	***E***	***72***	***E***
Powell Street/Christie Avenue	Signal	AM	29	C	28	C	29	C	29	C	36	C
		PM	46	D	46	D	46	D	52	D	***64***	***E***
		SAT	46	D	45	D	49	D	***62***	***E***	***68***	***E***
Powell Street/Hollis Street	Signal	AM	30	C	30	C	31	C	30	C	32	C
		PM	51	D	55	D	54	D	***56***	***E***	***61***	***E***
		SAT	24	C	24	C	24	C	26	C	26	C
40th Street/Horton Street	Signal	AM	21	C	21	C	21	C	21	C	21	C
		PM	28	C	28	C	28	C	29	C	29	C
40th Street/Hollis Street	Signal	AM	26	C	27	C	27	C	27	C	27	C
		PM	38	D	39	D	39	D	41	D	44	D
40th Street/Emery Street	Signal	AM	24	C	24	C	24	C	24	C	24	C
		PM	32	C	32	C	32	C	32	C	32	C
		SAT	21	C	21	C	21	C	21	C	21	C
40th Street/San Pablo Avenue	Signal	AM	33	C	33	C	33	C	33	C	34	C
		PM	45	D	45	D	45	D	47	D	47	D
		SAT	39	D	39	D	39	D	41	D	40	D
Mandela Pkwy/Horton Street	AWSC	AM	8	A	8	A	8	A	8	A	8	A
		PM	14	B	15	C	15	B	17	C	18	C
Shellmound Street/ Marketplace Driveway	AWSC	AM	8	A	9	A	9	A	9	A	16	C
		PM	20	C	50	E	47	E	68	F	> 100	F
		SAT	16	C	55	F	26	D	90	F	> 100	F

Source: Fehr & Peers, 2007.

TABLE 30
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
Ashby Avenue/San Pablo Avenue	Signal	AM	32	C	33	C	33	C	34	C	36	D
		PM	81	F	84	F	85	F	***92***	***F***	***95***	***F***
65th Street/Hollis Street	Signal	AM	15	B	16	B	15	B	18	B	18	C
		PM	32	C	36	D	40	D	49	D	***64***	***E***
64th Street/Shellmound Street	SSSC	AM	2 (11)	A (B)	2 (12)	A (B)	2 (12)	A (B)	3 (14)	A (B)	2 (18)	A (C)
		PM	2 (17)	A (C)	2 (21)	A (C)	2 (22)	A (C)	5 (43)	A (E)	8 (63)	A (F)
		SAT	2 (26)	A (D)	3 (43)	A (E)	2 (32)	A (D)	***69 (> 100)***	***F (F)***	32 (> 100)	D (F)
65th Street/Shellmound Street	Signal	AM	25	C	25	C	26	C	37	D	28	C
		PM	46	D	51	D	52	D	***58***	***E***	***62***	***E***
65th Street/Overland Avenue		SAT	32	C	32	C	30	C	38	D	37	D
I-80 Hook Ramps/Frontage Road	Signal	AM	15	B	15	B	16	B	15	B	16	B
		PM	42	D	44	D	44	D	47	D	***74***	***E***
		SAT	19	B	21	C	21	C	27	C	26	C
Powell Street/I-80 Eastbound Ramps	Signal	AM	28	C	30	C	41	D	31	C	41	D
		PM	101	F	***114***	***F***	***121***	***F***	***121***	***F***	***151***	***F***
		SAT	93	F	***106***	***F***	***99***	***F***	***118***	***F***	***124***	***F***
Powell Street/Christie Avenue	Signal	AM	33	C	33	C	36	D	33	C	39	D
		PM	86	F	86	F	86	F	***92***	***F***	***101***	***F***
		SAT	108	F	111	F	110	F	***126***	***F***	***132***	***F***
Powell Street/Hollis Street	Signal	AM	37	D	38	D	40	D	38	D	42	D
		PM	80	E	84	F	***90***	***F***	***88***	***F***	***99***	***F***
		SAT	28	C	30	C	29	C	34	C	35	C
40th Street/Horton Street	Signal	AM	23	C	23	C	23	C	23	C	24	C
		PM	34	C	34	C	34	C	36	D	36	D
40th Street/Hollis Street	Signal	AM	28	C	29	C	29	C	31	C	32	C
		PM	50	D	52	D	***56***	***E***	***57***	***E***	***63***	***E***
40th Street/Emery Street	Signal	AM	23	C	23	C	23	C	23	C	23	C
		PM	36	D	36	D	37	D	37	D	39	D
		SAT	24	C	24	C	24	C	24	C	24	C

TABLE 30
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
40th Street/San Pablo Avenue	Signal	AM	36	D	36	D	36	D	36	D	36	D
		PM	72	E	74	E	75	E	***78***	***E***	***81***	***F***
		SAT	70	E	72	E	71	E	***76***	***E***	***76***	***E***
Mandela Pkwy/Horton Street	AWSC	AM	9	A	9	A	9	A	10	A	10	A
		PM	22	C	24	C	24	C	30	D	32	D
Shellmound Street/ Marketplace Driveway	AWSC	AM	8	A	9	A	9	A	10	A	18	C
		PM	34	D	51	F	73	F	> 100	F	> 100	F
		SAT	28	D	> 100	F	> 100	F	> 100	F	> 100	F

Source: Fehr & Peers, 2007.

TABLE 31
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
Ashby Avenue/San Pablo Avenue	Signal	AM	40	D	41	D	40	D	43	D	50	D
		PM	128	F	***135***	***F***	***134***	***F***	***148***	***F***	***150***	***F***
65th Street/Hollis Street	Signal	AM	15	B	16	B	16	B	19	B	20	B
		PM	40	D	47	D	47	D	***61***	***E***	***76***	***E***
64th Street/Shellmound Street	SSSC	AM	2 (12)	A (B)	2 (13)	A (B)	2 (13)	A (B)	3 (16)	A (C)	6 (58)	A (F)
		PM	2 (20)	A (C)	2 (27)	A (D)	2 (25)	A (C)	16 (173)	C (F)	25 (228)	C (F)
		SAT	2 (46)	A (E)	8 (127)	A (F)	5 (76)	A (F)	***>100 (>100)***	***F (F)***	***>100 (>100)***	***F (F)***
65th Street/Shellmound Street	Signal	AM	31	C	32	C	32	C	36	D	42	D
		PM	96	F	***102***	***F***	***136***	**F**	***131***	***F***	***128***	***F***
65th Street/Overland Avenue		SAT	43	D	53	D	55	D	***86***	***F***	***61***	***E***

TABLE 31
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
I-80 Hook Ramps/Frontage Road	Signal	AM	16	B	16	B	16	B	16	B	16	B
		PM	42	D	43	D	43	D	46	D	***111***	***F***
		SAT	20	B	20	B	20	B	22	C	22	C
Powell Street/I-80 Eastbound Ramps	Signal	AM	37	D	39	D	46	D	40	D	52	D
		PM	102	F	***115***	***F***	***114***	***F***	***124***	***F***	***151***	***F***
		SAT	101	F	***112***	***F***	***106***	***F***	***119***	***F***	***127***	***F***
Powell Street/Christie Avenue	Signal	AM	56	E	56	E	56	E	56	E	56	E
		PM	90	F	90	F	90	F	90	F	90	F
		SAT	136	F	136	F	137	F	137	F	138	F
Powell Street/Hollis Street	Signal	AM	51	D	51	D	52	D	52	D	***58***	***E***
		PM	114	F	***120***	***F***	***122***	***F***	***125***	***F***	***138***	***F***
		SAT	45	D	50	D	47	D	***58***	***E***	***60***	***E***
40th Street/Horton Street	Signal	AM	37	D	37	D	37	D	37	D	37	D
		PM	127	F	128	F	128	F	***133***	***F***	***137***	***F***
40th Street/Hollis Street	Signal	AM	35	D	38	D	37	D	41	D	42	D
		PM	82	F	85	F	***87***	***F***	***90***	***F***	***99***	***F***
40th Street/Emery Street	Signal	AM	29	C	29	C	29	C	29	C	29	C
		PM	104	F	106	F	107	F	***109***	***F***	***114***	***F***
		SAT	81	F	83	F	82	F	***88***	***F***	***88***	***F***
40th Street/San Pablo Avenue	Signal	AM	45	D	45	D	45	D	45	D	45	D
		PM	142	F	145	F	145	F	***148***	***F***	***152***	***F***
		SAT	130	F	133	F	131	F	***138***	***F***	***138***	***F***
Mandela Pkwy/Horton Street	Signal	AM	11	B	11	B	11	B	11	B	11	B
		PM	71	E	75	E	74	E	***85***	***F***	***86***	***F***
Shellmound Street/Marketplace Driveway	AWSC	AM	8	A	9	A	9	A	10	A	18	C
		PM	32	D	56	F	75	F	> 100	F	> 100	F
		SAT	32	D	> 100	F	> 100	F	> 100	F	> 100	F

Source: Fehr & Peers, 2007.

TABLE 32
PROJECT ALTERNATIVES
IMPACT COMPARISON SUMMARY

Intersection	Proposed Project	Alternative 2	Alternative 3	Alternative 4
Ashby Avenue/San Pablo Avenue	2030	2030	2010, 2030	2010, 2030
65th Street/Shellmound Street	Existing	Existing	Existing	Existing
65th Street/Shellmound Street/Overland Street	2030	2030	2010, 2030	2010,2030
65th Street/Hollis Street	Impact less than Significant	Impact less than Significant	2030	2010, 2030
64th Street/Shellmound Street	Impact less than Significant	Impact less than Significant	2010, 2030	2010, 2030
I-80 Hook Ramps/Frontage Road	Impact less than Significant	Impact less than Significant	No Impact	2010, 2030
Powell Street/I-80 Eastbound Ramps	Existing, 2010, 2030	Existing, 2010, 2030	Existing, 2010, 2030	Existing, 2010, 2030
Powell Street/Christie Street	Impact less than Significant	Impact less than Significant	2010	2010
Powell Street/Hollis Street	2030	2010, 2030	Existing, 2010, 2030	Existing, 2010, 2030
40th Street/Horton Street	Impact less than Significant	Impact less than Significant	2030	2030
40th Street/Hollis Street	Impact less than Significant	2010, 2030	2010, 2030	2010, 2030
40th Street/Emery Street	Impact less than Significant	Impact less than Significant	2030	2030
40th Street/San Pablo Avenue	Impact less than Significant	Impact less than Significant	2010, 2030	2010, 2030
Mandela Parkway/Horton Street	Impact less than Significant	Impact less than Significant	2030	2030
Shellmound Street/Marketplace Driveway	Existing, 2010, 2030	Existing, 2010, 2030	Existing, 2010, 2030	Existing, 2010, 2030

Source: Fehr & Peers, 2007.

PROJECT ALTERNATIVES MITIGATION MEASURES

Additional mitigation measures would be required for the project alternatives to mitigate their additional impacts.

Alternative 2

The reduced project alternative would result in one additional significant impact as compared to the Proposed Project, primarily due to the increased number of outbound trips during the PM peak hour. Alternative 2 would also result in similar queuing impact as compared to the Proposed Project. Mitigation measures developed for the Proposed Project would need to be implemented in condition with additional measures discussed below:

40th Street/Hollis Street – Retime the traffic signals on the 40th Street corridor.

Alternative 3

Alternative 3 would result in eight additional intersection impacts. Alternative 3 would likely exacerbate the queuing impacts identified for the Proposed Project. Project Mitigation measures developed for the Proposed Project would need to be implemented in condition with additional measures discussed below:

65th Street/Hollis Street – Retime the traffic signal.

64th Street/Shellmound Street – Install a traffic signal when warranted by actual conditions.

Powell Street/Christie Street – Modify the intersection to provide dual westbound left-turn lanes, an exclusive southbound left-turn lane (in addition to the shared left-through lane), increase the storage length of the westbound right-turn pocket. These improvements would require widening of Powell Street and Christie Avenue and would also increase pedestrian crossing distance for the intersection.

40th Street/Horton Street – Retime the traffic signals on the 40th Street corridor.

40th Street/Hollis Street – Retime the traffic signals on the 40th Street corridor.

40th Street/Emery Street – Retime the traffic signals on the 40th Street corridor.

40th Street/San Pablo Avenue – Implement the planned improvements to the 40th Street/San Pablo Avenue intersection, including the provision of an eastbound right turn lane. Install this improvement with a right turn overlap phase and retiming of the signals on the 40th Street and San Pablo Avenue corridors, taking into account BRT operation. San Pablo Avenue is a Caltrans facility and implementation of this measure cannot be assured by the City of Emeryville.

Mandela Parkway/Horton Street – Install a traffic signal and left-turn pockets when warranted by actual conditions. This intersection is in the City of Oakland and implementation of this measure cannot be assured by the City of Emeryville.

Alternative 4

Alternative 4 would result in nine additional intersection impacts. Alternative 4 would likely exacerbate the queuing impacts identified for the Proposed Project. Some measures identified to mitigate the impacts of the Proposed Project may not be sufficient to mitigate the impacts of Alternative 4, and additional measures should be considered. Project Mitigation measures developed for the Proposed Project would need to be implemented in condition with additional measures discussed below:

65th Street/Hollis Street – Retime the traffic signal.

64th Street/Shellmound Street – Install a traffic signal when warranted by actual conditions.

I-80 Hook Ramps/Frontage Road – Provide a second southbound through lane. This intersection is a Caltrans facility and implementation of this measure cannot be assured by the City of Emeryville.

Powell Street/Christie Street – Modify the intersection to provide dual westbound left-turn lanes, an exclusive southbound left-turn lane (in addition to the shared left-through lane), increase the storage length of the westbound right-turn pocket. These improvements would require widening of Powell Street and Christie Avenue and would also increase pedestrian crossing distance for the intersection.

40th Street/Horton Street – Retime the traffic signals on the 40th Street corridor.

40th Street/Hollis Street – Retime the traffic signals on the 40th Street corridor.

40th Street/Emery Street – Retime the traffic signals on the 40th Street corridor.

40th Street/San Pablo Avenue – Implement the planned improvements to the 40th Street/San Pablo Avenue intersection, including the provision of an eastbound right turn lane. Install this improvement with a right turn overlap phase and retiming of the signals on the 40th Street and San Pablo Avenue corridors, taking into account BRT operation. San Pablo Avenue is a Caltrans facility and implementation of this measure cannot be assured by the City of Emeryville.

Mandela Parkway/Horton Street – Install a traffic signal when warranted by actual conditions. This intersection is in the City of Oakland and implementation of this measure cannot be assured by the City of Emeryville.

In addition to the intersection impacts identified above, the intersection of 63rd Street/Shellmound Street could experience some operational difficulties given the amount of traffic expected to use this intersection, its skewed orientation and provision of a ramp to the parking garage. Relocating the ramp to the parking structure opposite 62nd Street should be considered to improve traffic flow on Shellmound Street with this alternative. Additionally, the provision of on-street parking on Shellmound Street would decrease the capacity of this corridor, reducing potential traffic shifts to the Ashby Avenue interchange, resulting in additional impacts at the Powell Street interchange.

Other measures that should be considered with Alternative 4 include converting Shellmound Street and Christie Street to a one-way loop system; improving the amount and frequency of public transit to the site; limiting the amount of parking that could be constructed with the project; improving bicycle and pedestrian connections throughout the area; and providing a car-share service on-site to minimize auto ownership/use among residents and employees of the site.

APPENDIX B-1

PROPOSED PROJECT
TRANSPORTATION, CIRCULATION, AND PARKING STUDY
AND
LOS TRAFFIC MODELING OUTPUTS

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Technical Appendix

Emeryville Marketplace

June 2007

Prepared for:
LSA Associates, Inc.
and City of Emeryville, CA

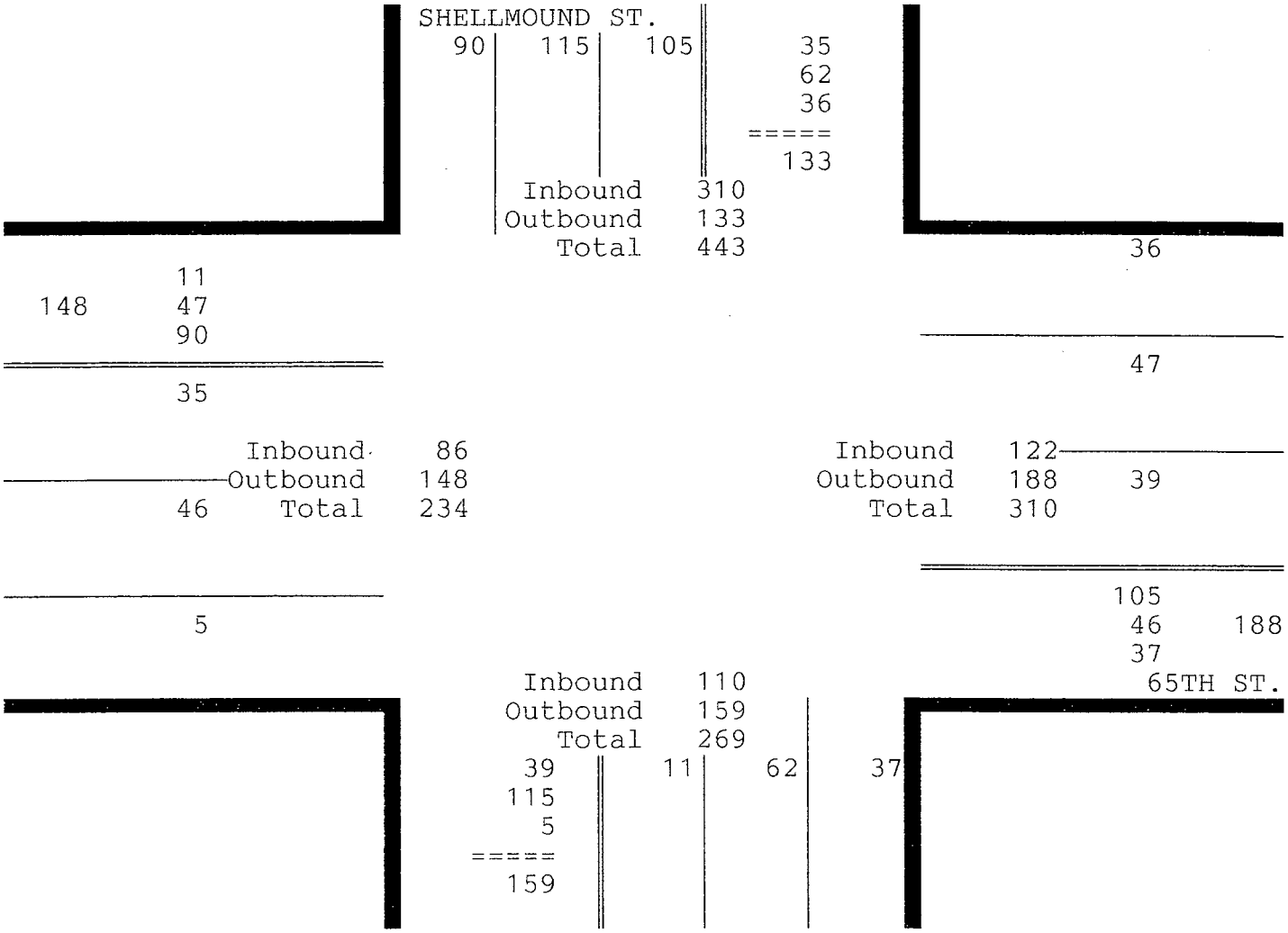
APPENDIX A:
TRAFFIC COUNTS

AM TRAFFIC COUNTS

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/23/05
File I.D. : EMR3F
Page : 2

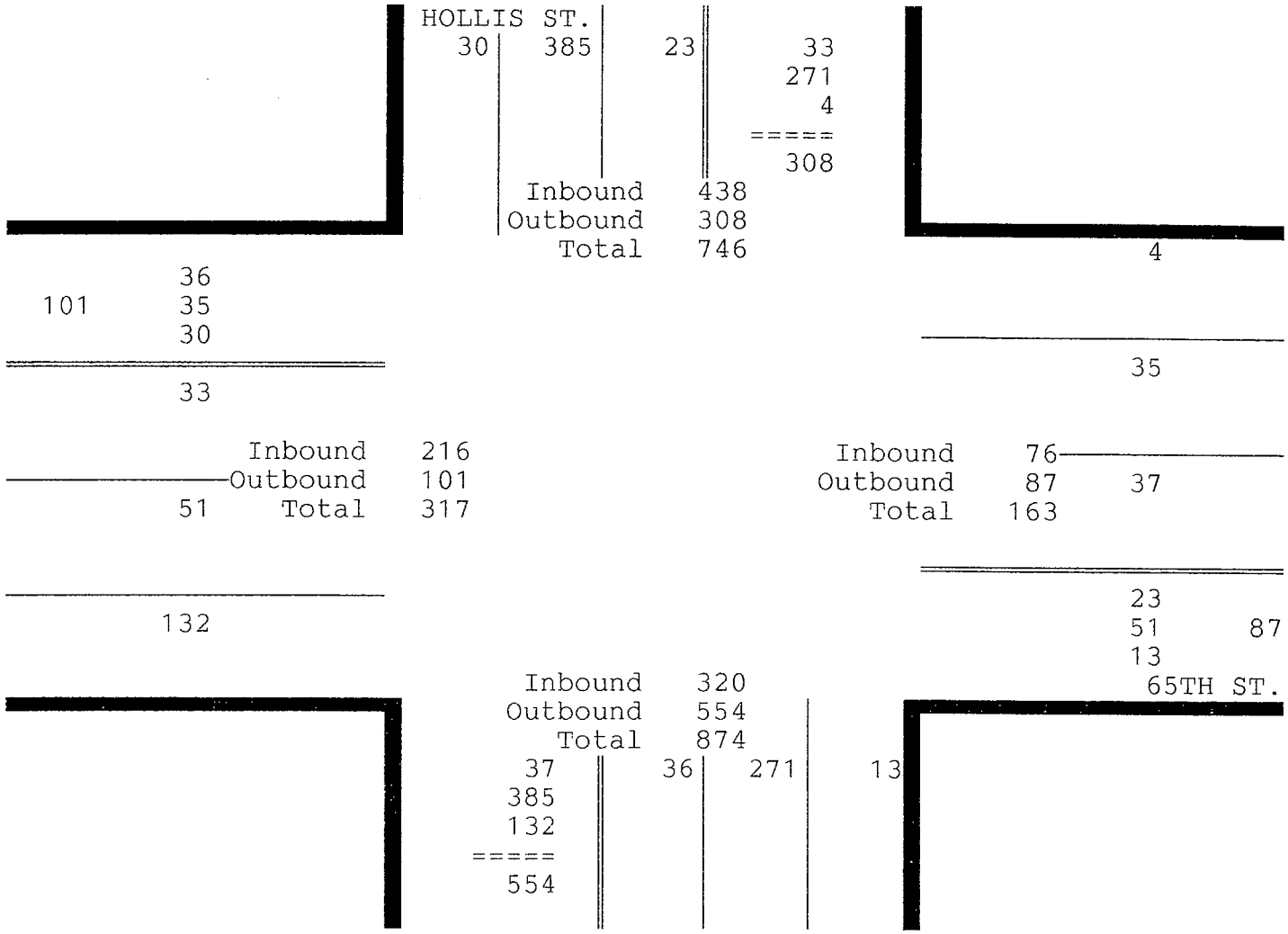


4 AM

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/23/05
File I.D. : EMER5F
Page : 2

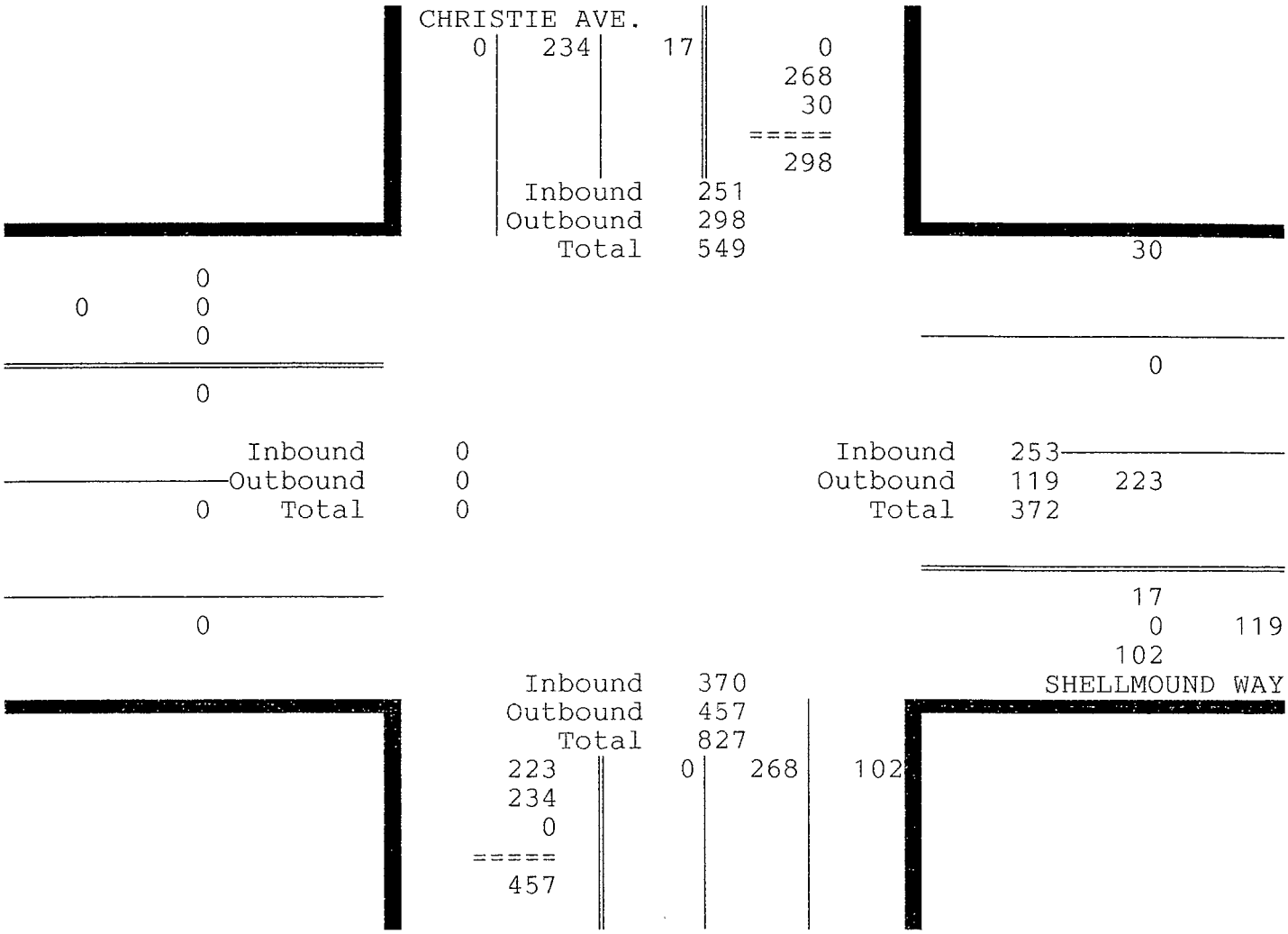


6 AM

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/23/05
File I.D. : EMER13F
Page : 2

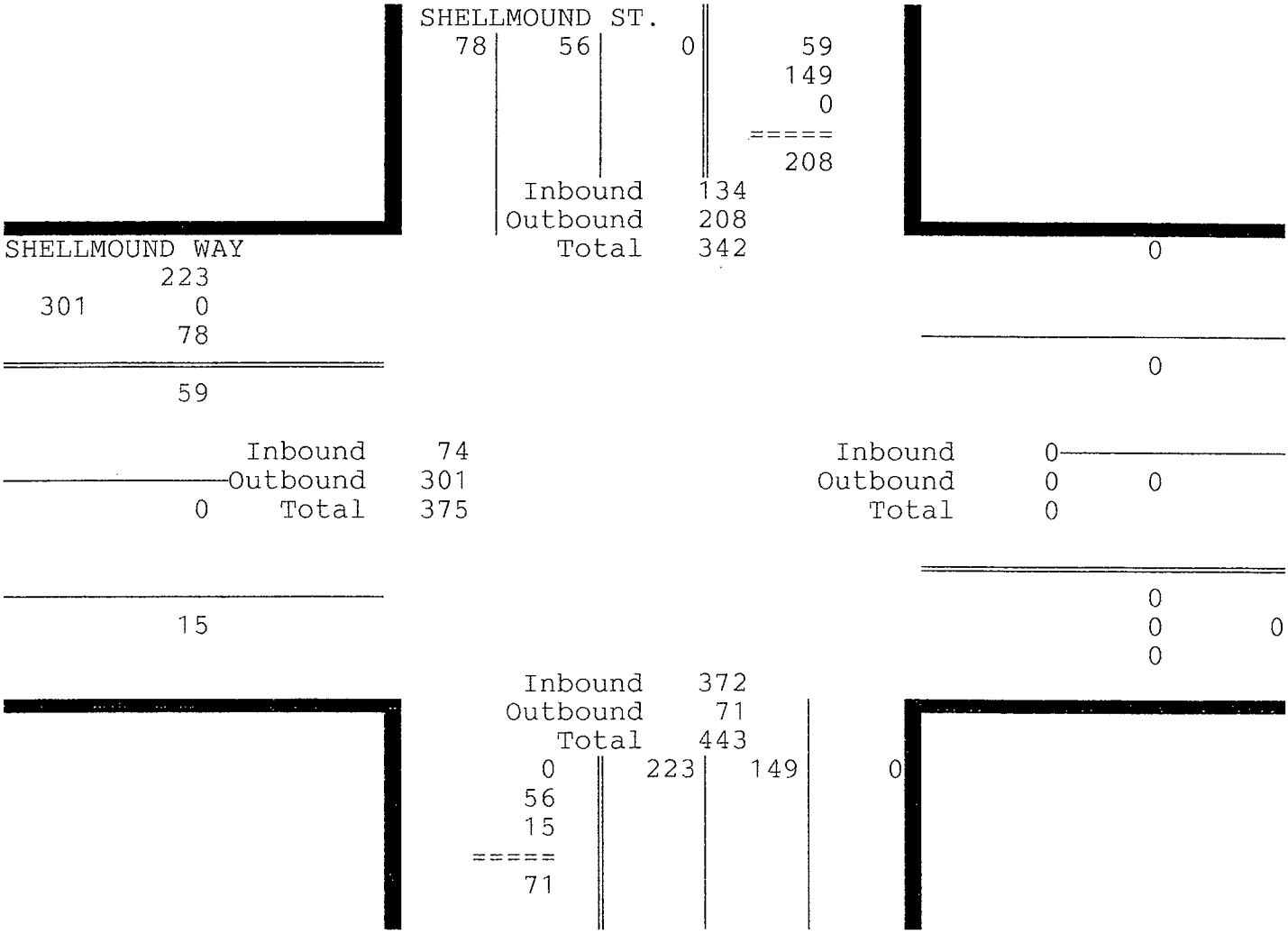


9 Am

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

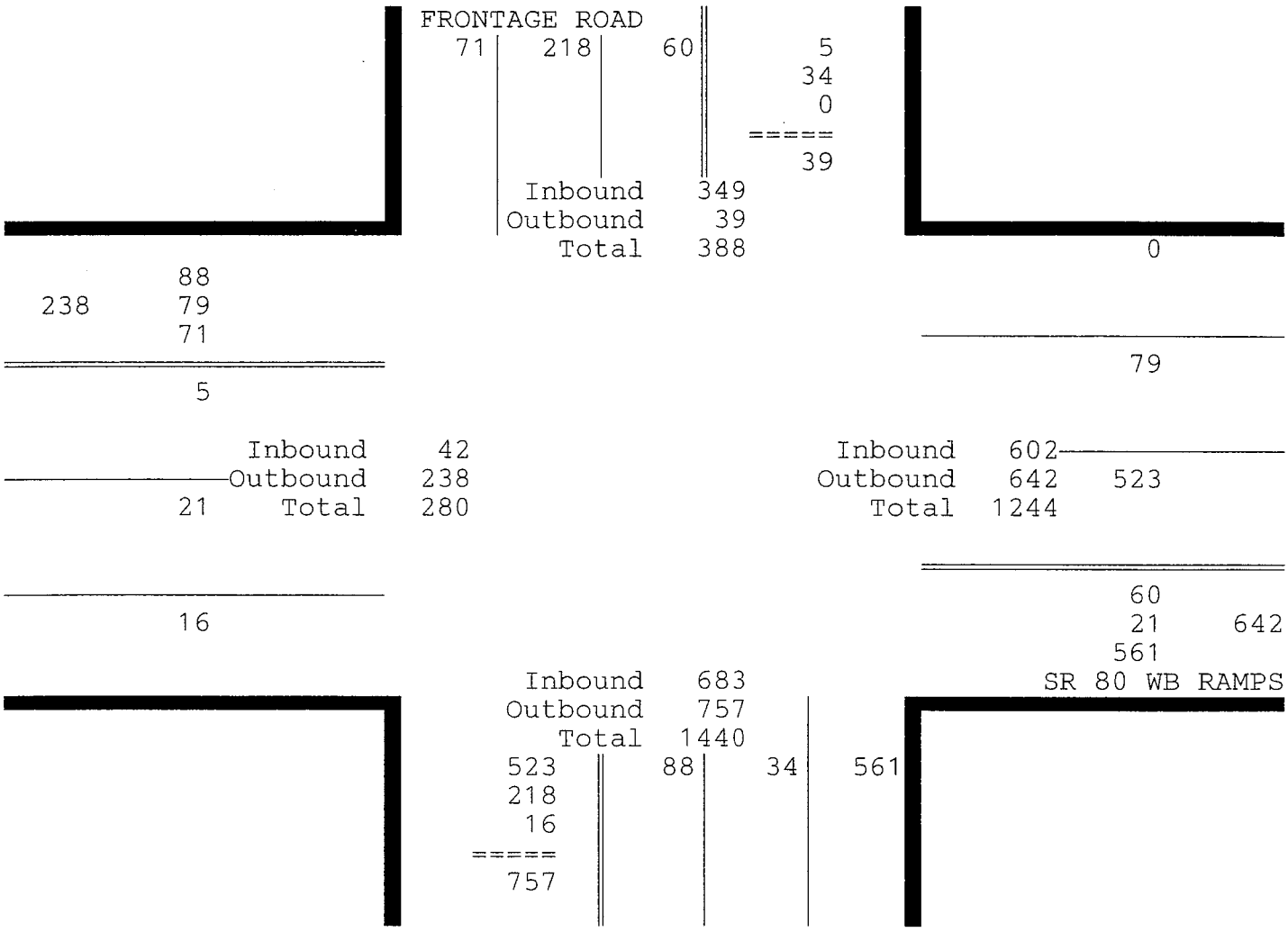
Site Code : 00000000
Start Date: 02/24/05
File I.D. : EMER14F
Page : 2



10 Am

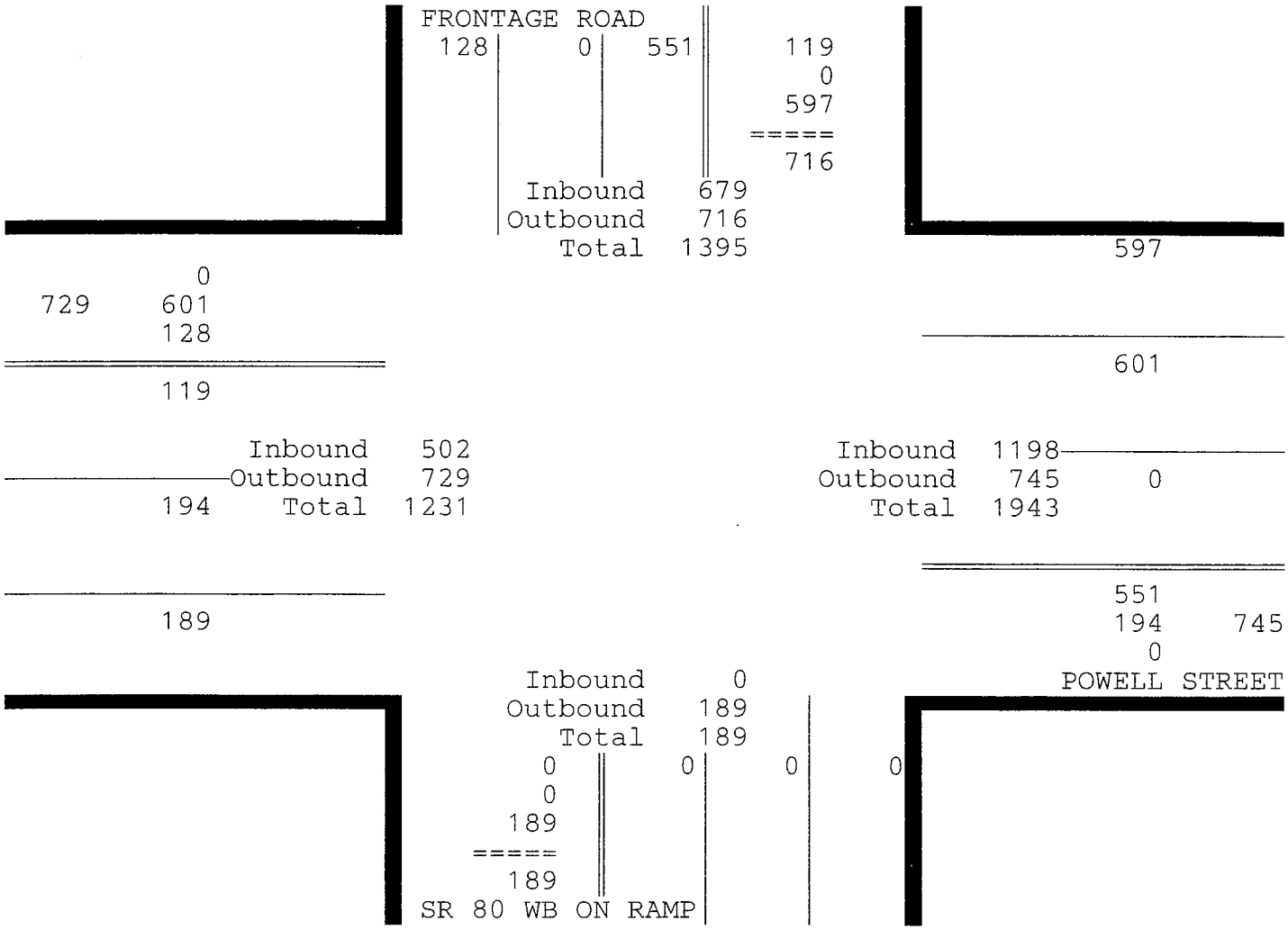
CITY OF EMERYVILLE

Site Code : 00000000
Start Date: 02/23/05
File I.D. : 10
Page : 2



CITY OF EMERYVILLE

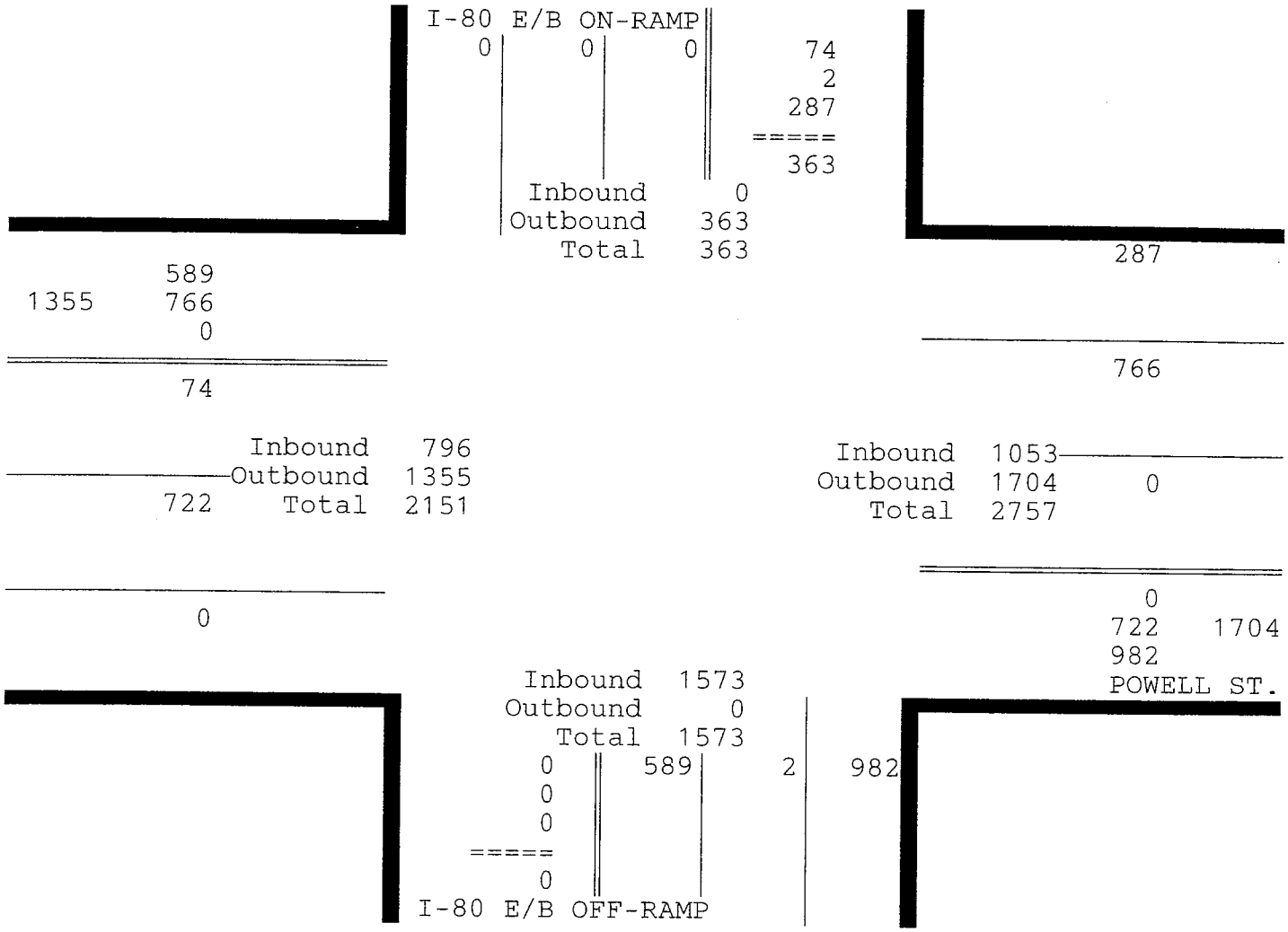
Site Code : 00000000
Start Date: 02/23/05
File I.D. : 11
Page : 2



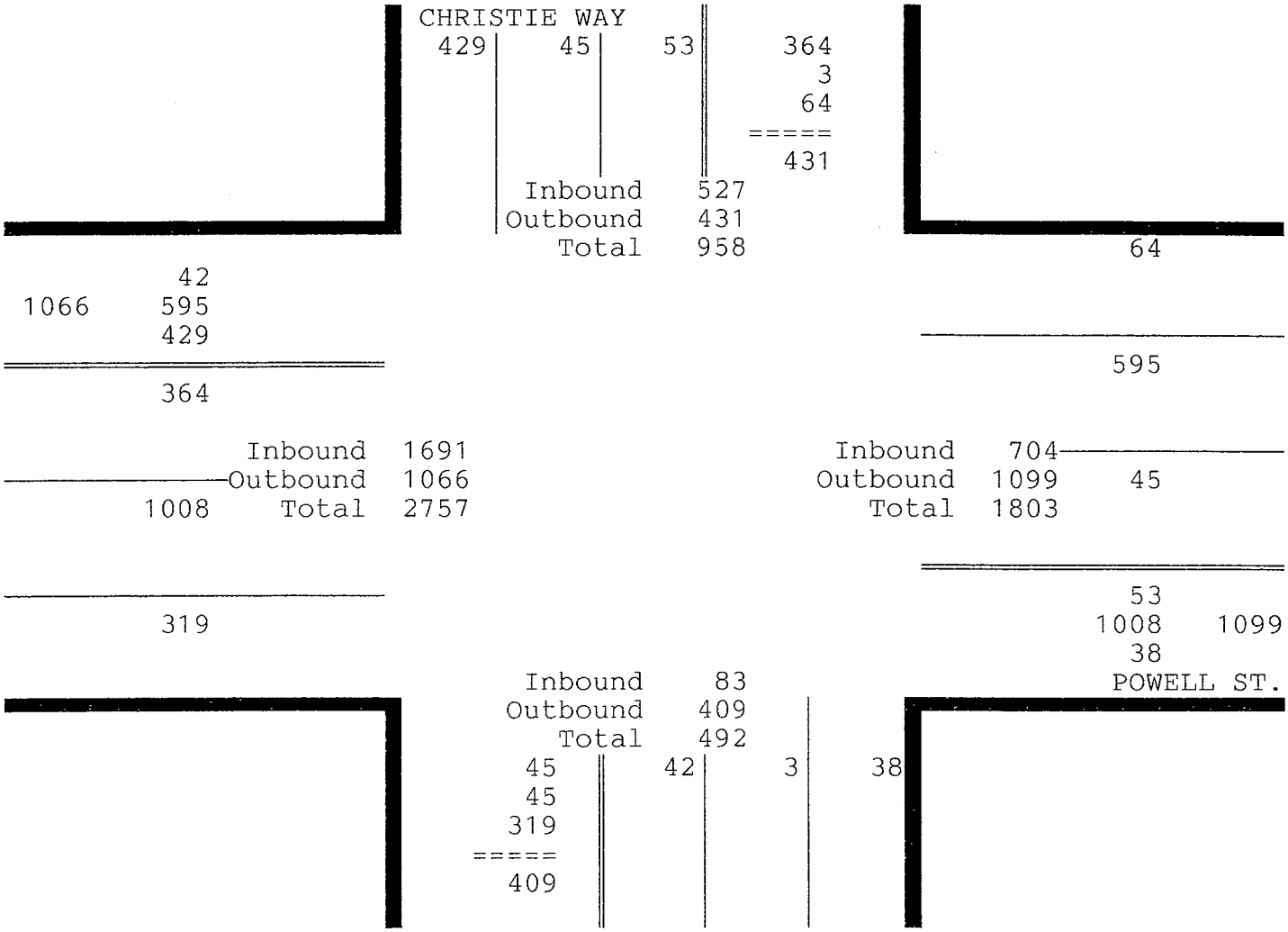
12 Am

CITY OF EMERYVILLE

Site Code : 00000000
Start Date: 02/24/05
File I.D. : 12
Page : 2



13 Am


CHRISTIE WAY
429
45
53
364
3
64
=====
431
Inbound 527
Outbound 431
Total 958
64
42
1066 595
429
364
595
Inbound 1691
Outbound 1066
Total 2757
1008
Inbound 704
Outbound 1099
Total 1803
45
319
53
1008 1099
38
POWELL ST.
Inbound 83
Outbound 409
Total 492
45
42
3
38
45
319
=====
409

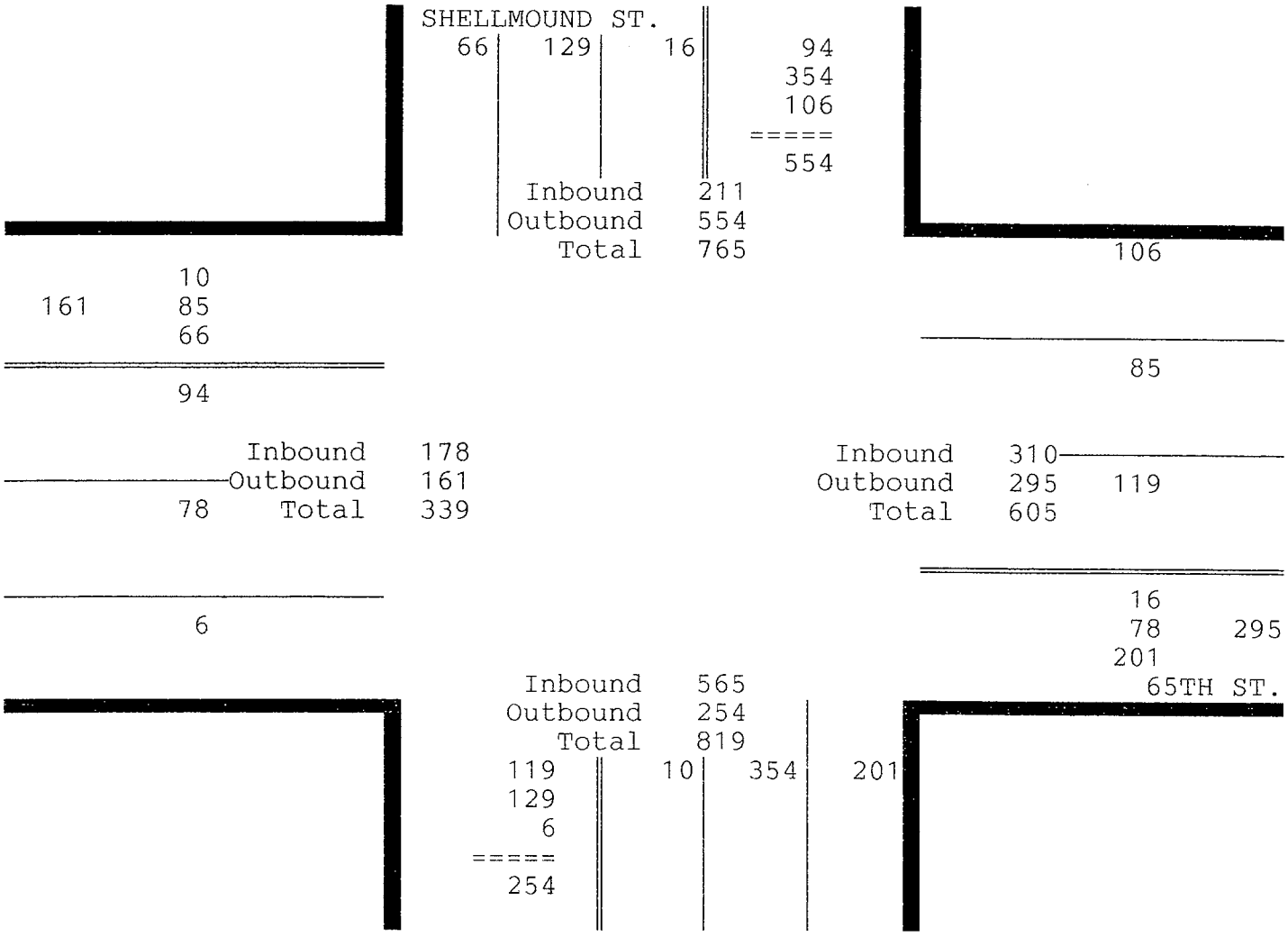
14 Am

PM TRAFFIC COUNTS

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/23/05
File I.D. : EMR3F
Page : 2

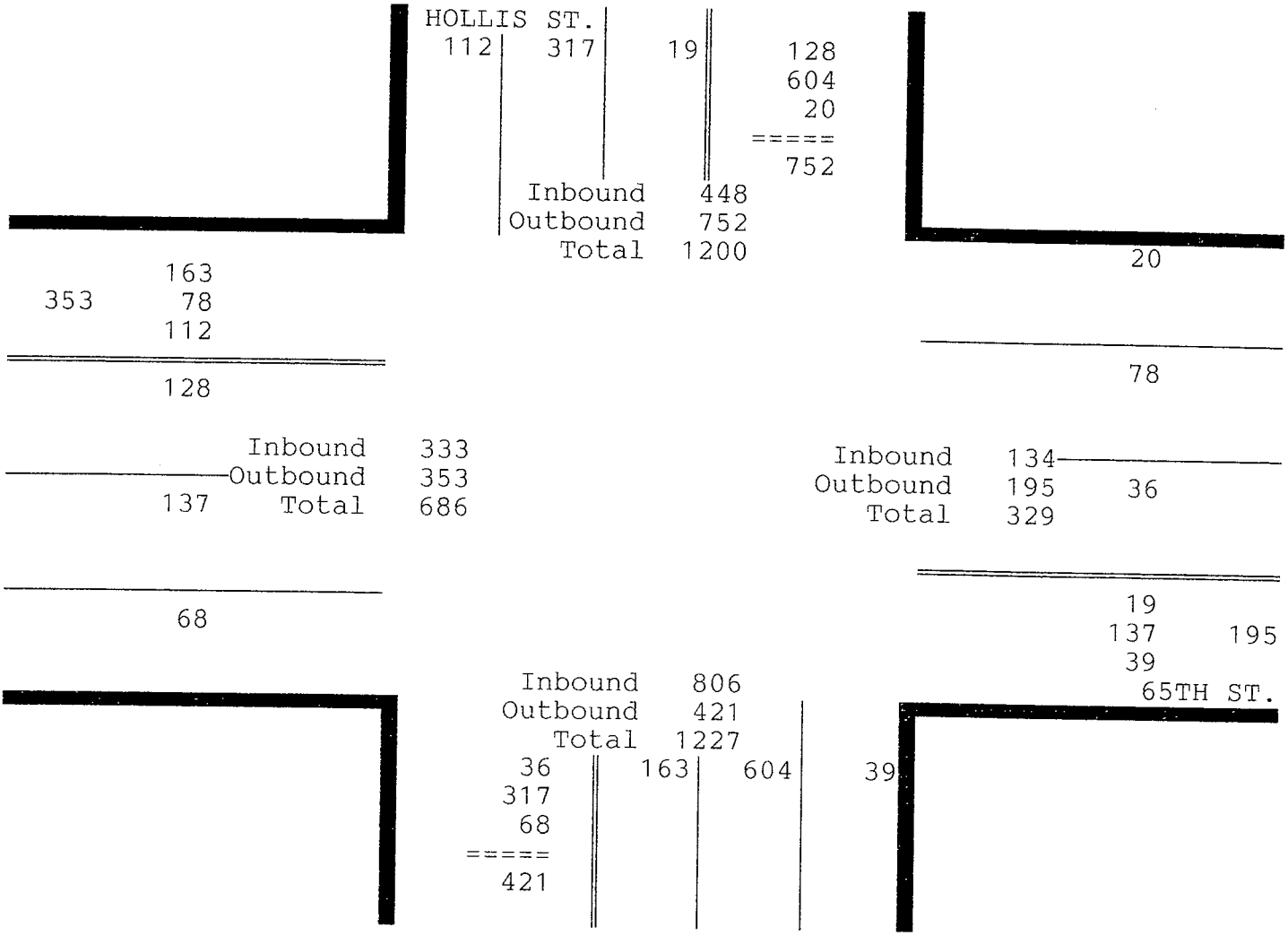


4 PM

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/23/05
File I.D. : EMER5F
Page : 2

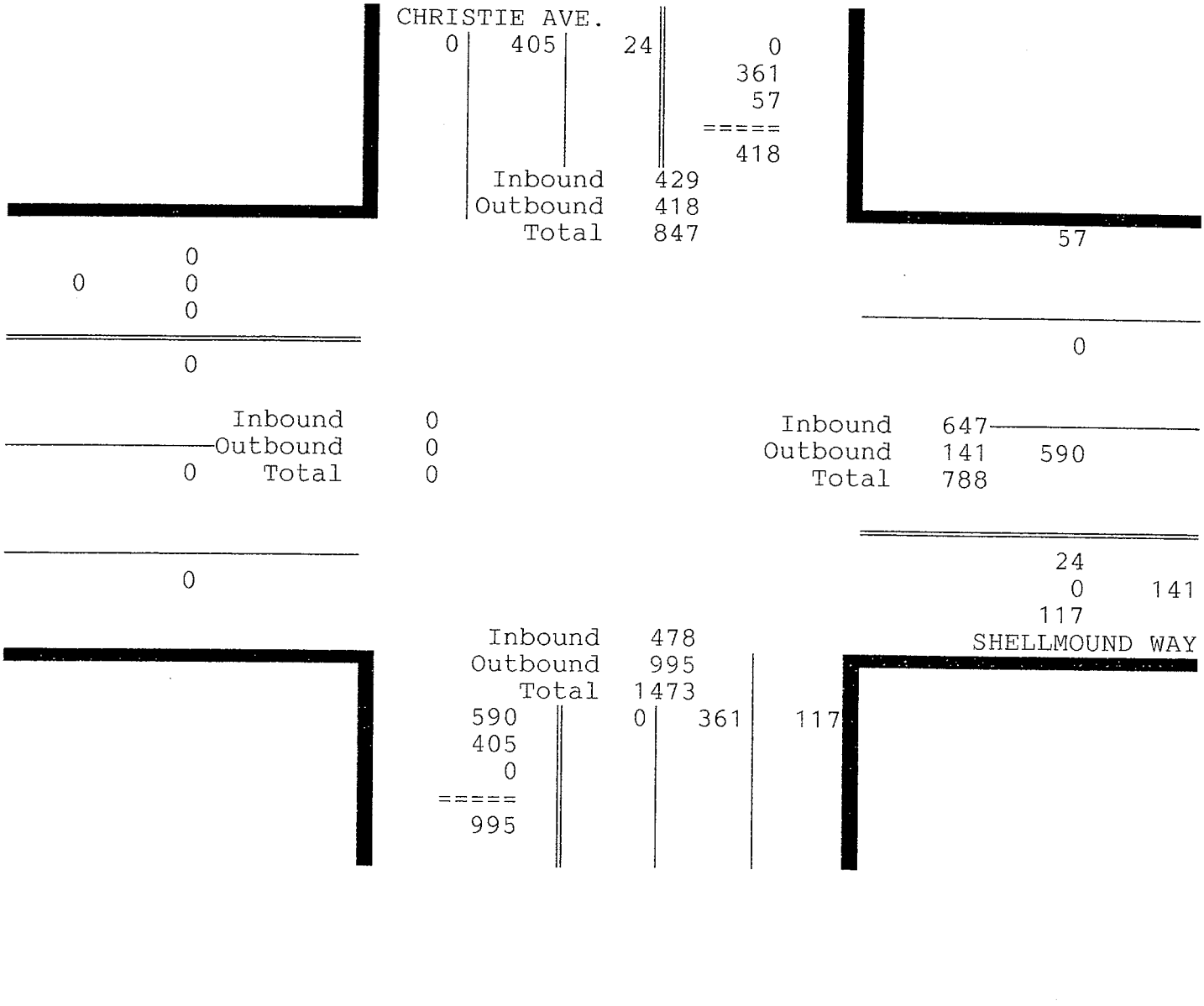


6pm

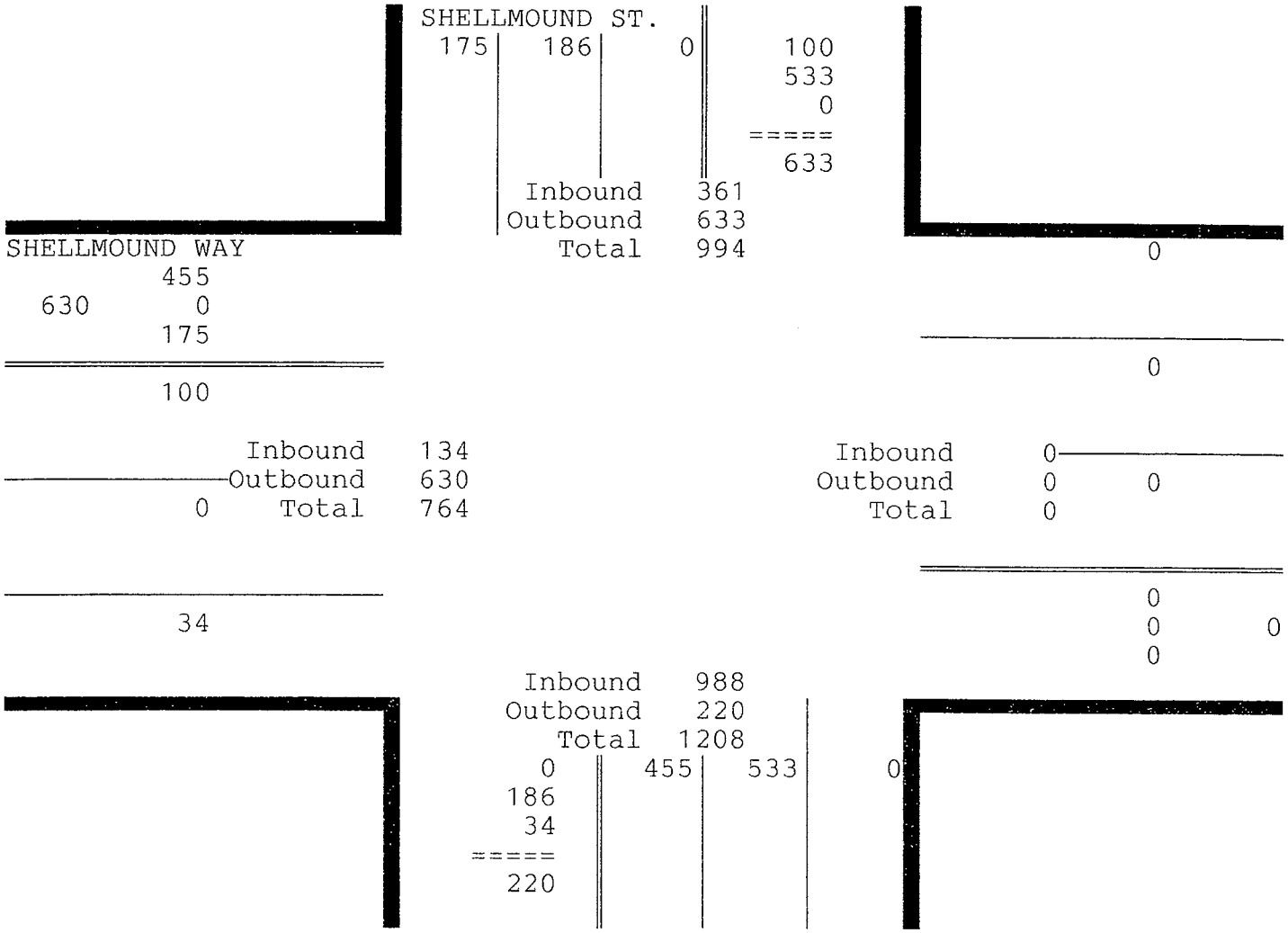
CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/23/05
File I.D. : EMER13F
Page : 2



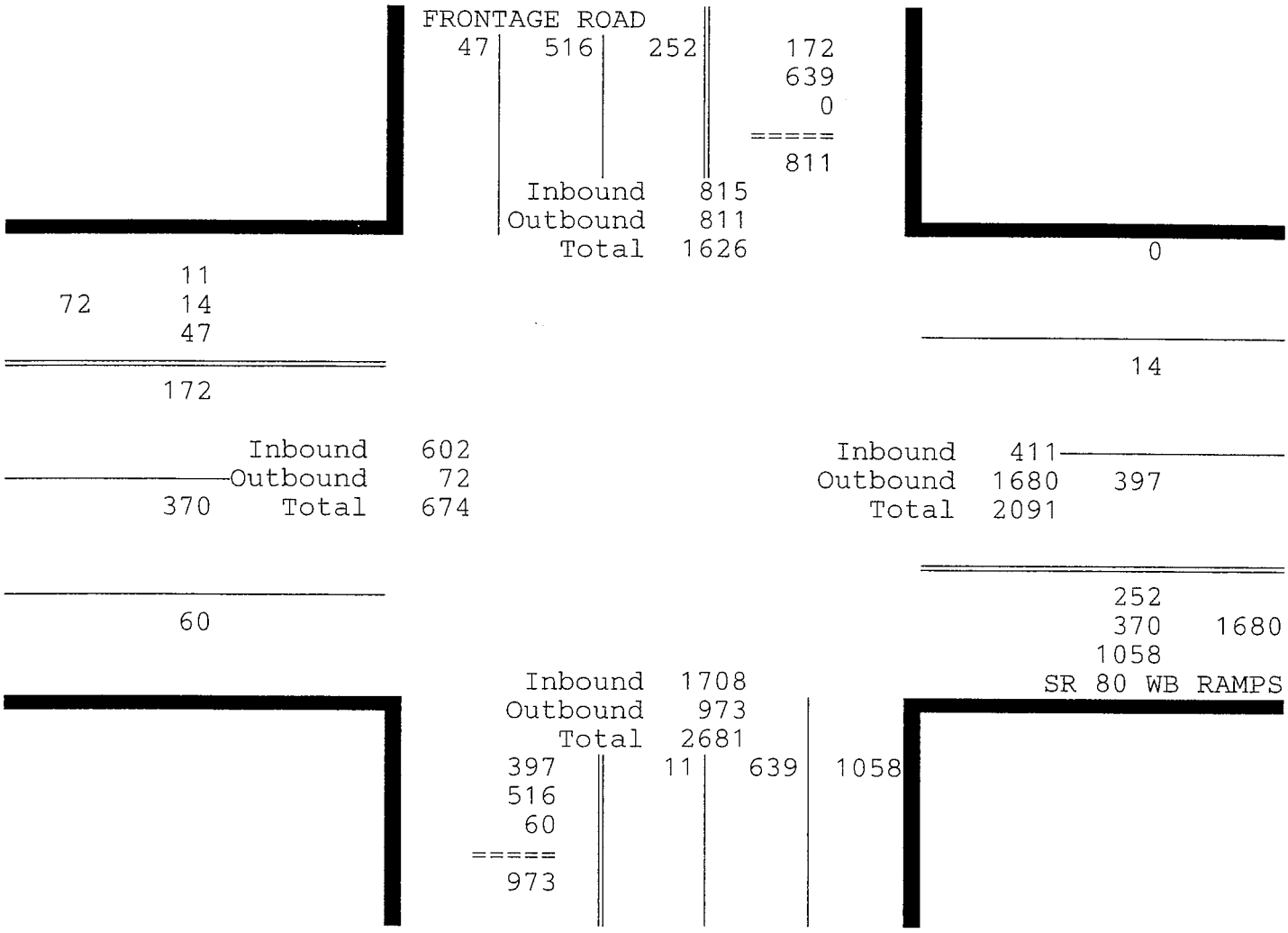
9 pm


SHELLMOUND ST.
175
186
0
100
533
0
=====
633
Inbound 361
Outbound 633
Total 994
SHELLMOUND WAY
455
630
0
175
100
Inbound 134
Outbound 630
Total 764
0
34
0
0
0
Inbound 0
Outbound 0
Total 0
0
0
0
Inbound 988
Outbound 220
Total 1208
0
186
34
=====
220
455
533
0

10 pm

CITY OF EMERYVILLE

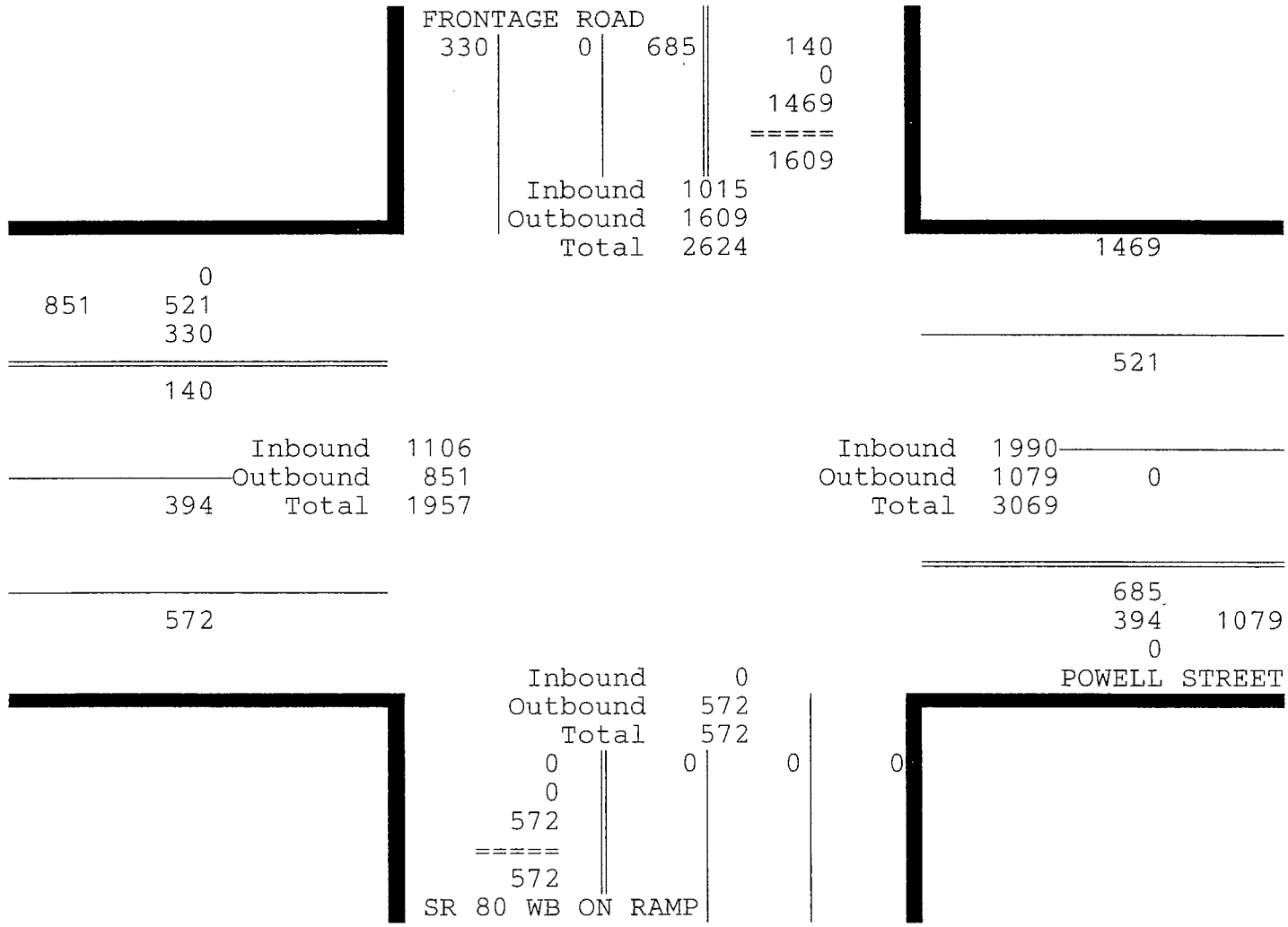
Site Code : 00000000
Start Date: 02/23/05
File I.D. : 10
Page : 2



11 pm

CITY OF EMERYVILLE

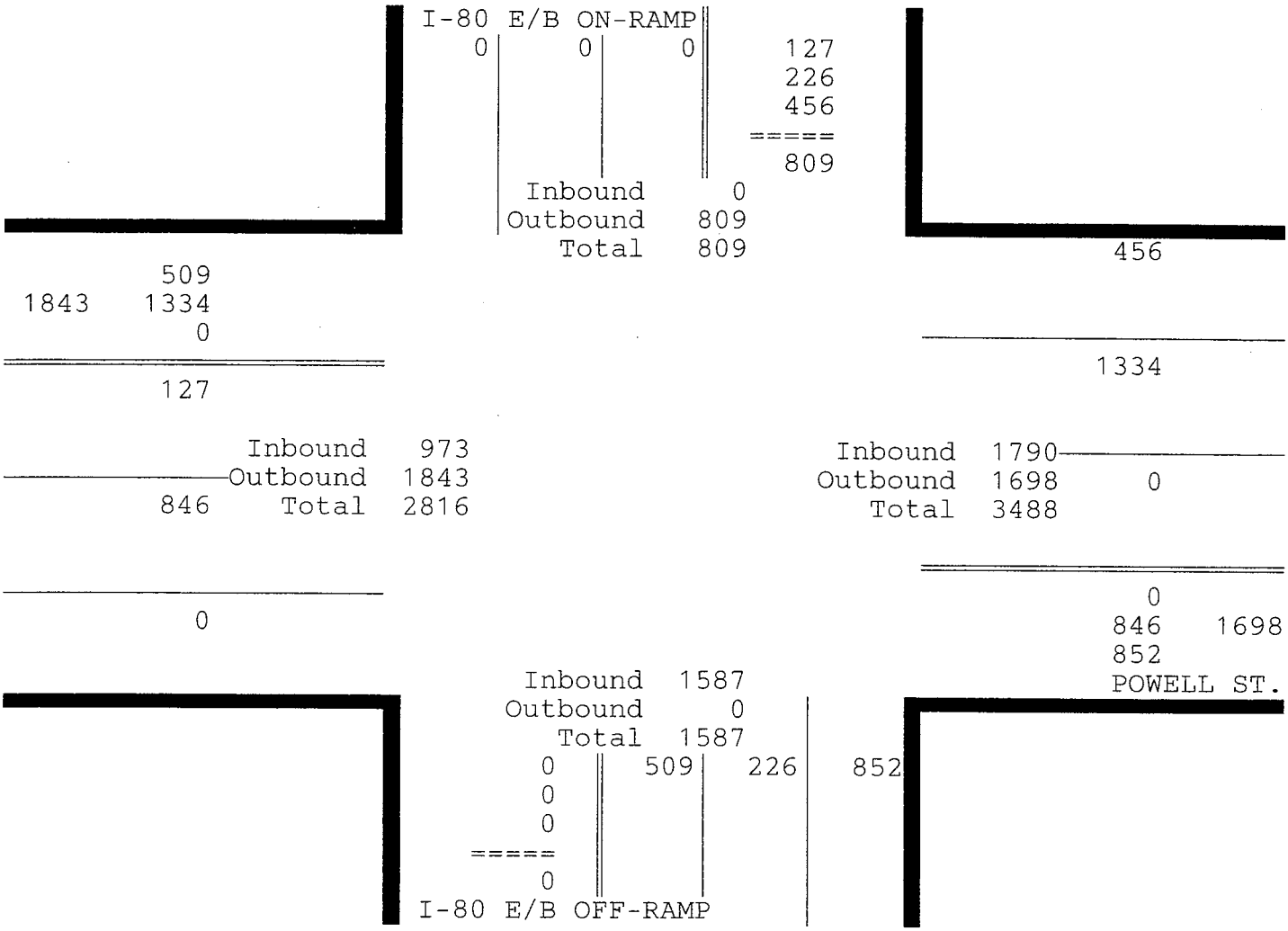
Site Code : 0000
Start Date: 02/2
File I.D. : 11
Page : 2



12pm

CITY OF EMERYVILLE

Site Code : 00000000
Start Date: 02/24/05
File I.D. : 12
Page : 2

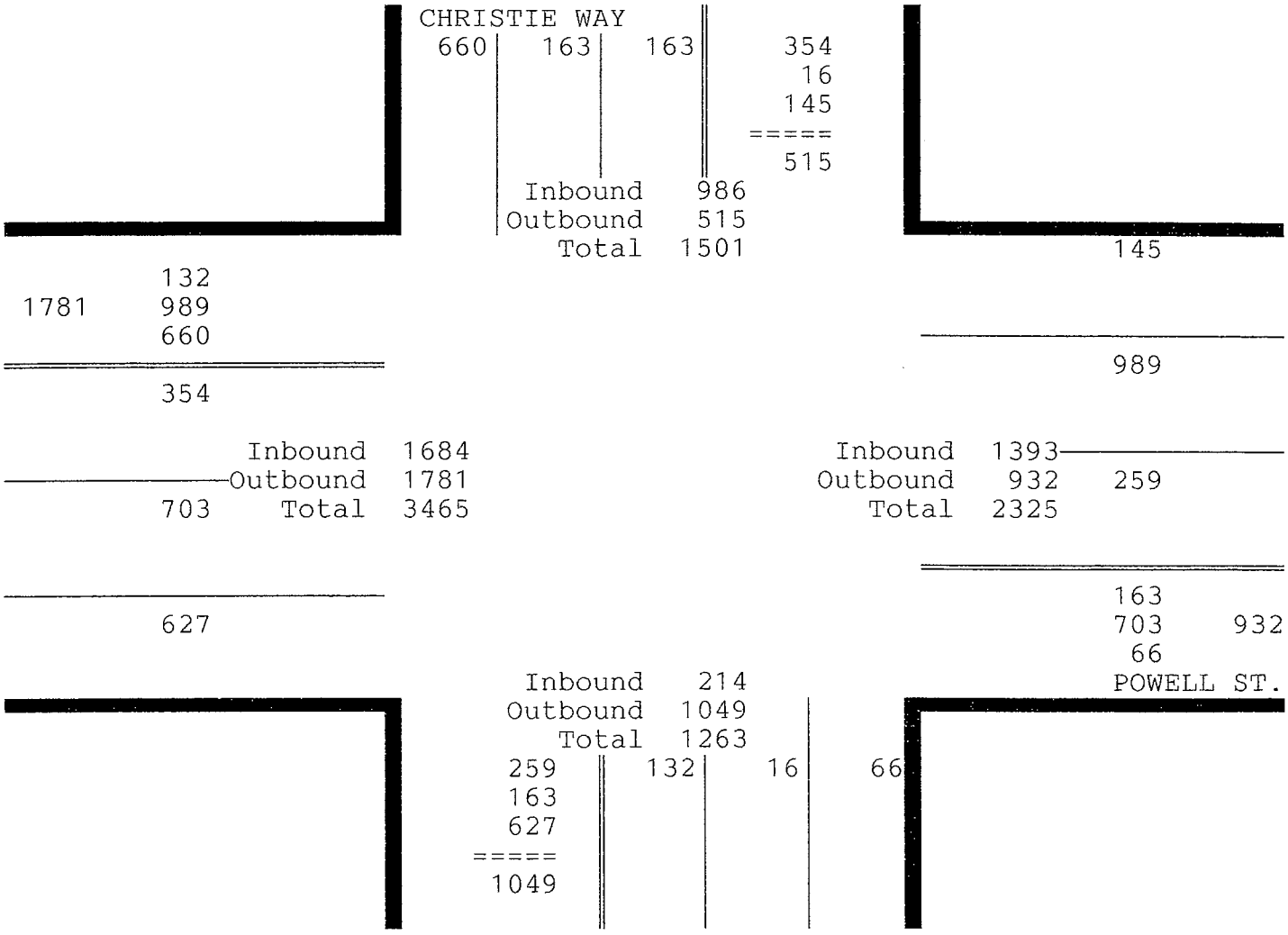


13 PM

CITY OF EMERYVILLE

All Traffic Data
(916) 771-8700
Fax 786-2879

Site Code : 00000000
Start Date: 02/24/05
File I.D. : EMER15F
Page : 2



14 pm

SATURDAY TRAFFIC COUNTS

All Traffic Data
(916) 771-8700
Fax 786-2879

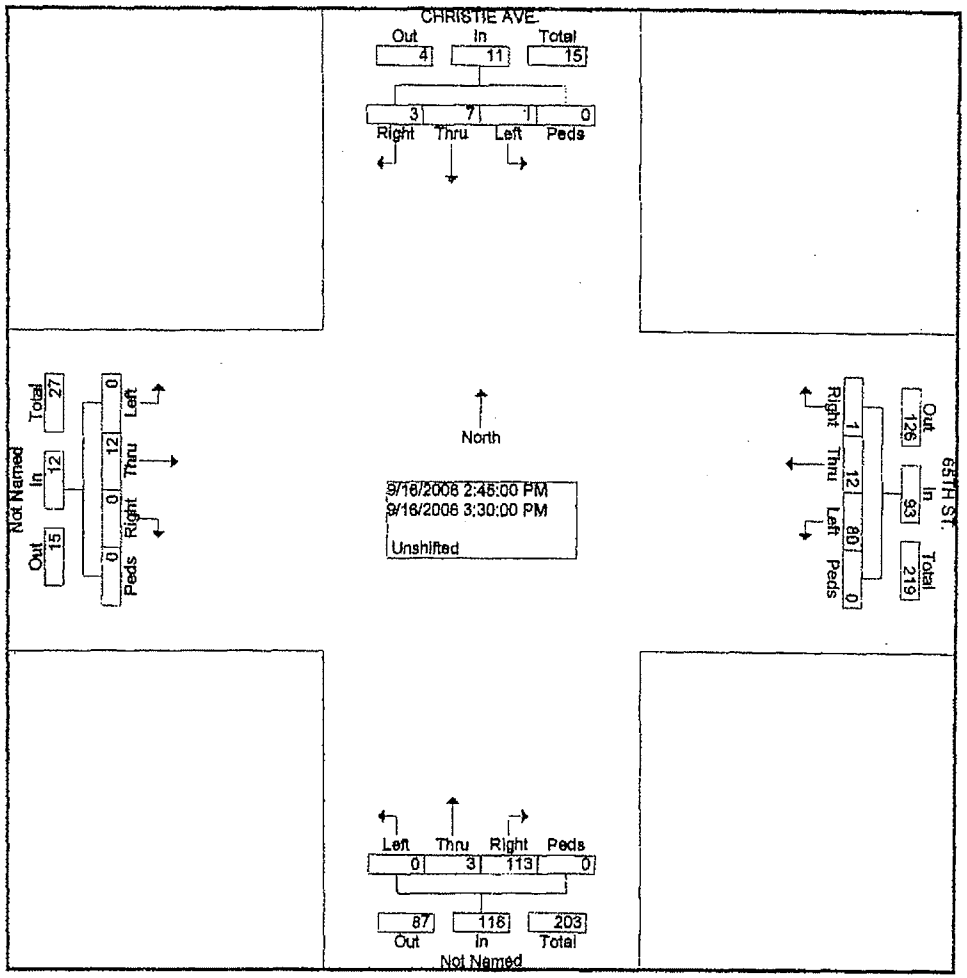
EMERY BAY MARKETPLACE

File Name : Christie-65th-F
Site Code : 00000000
Start Date : 9/16/2006
Page No : 1

Groups Printed- Unshifted

	CHRISTIE AVE. Southbound					65TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	0	0	0	0	0	0	0	15	0	15	27	0	0	0	27	0	3	0	0	3	45
01:15 PM	0	0	0	0	0	0	4	17	0	21	19	0	0	1	20	1	2	0	0	3	44
01:30 PM	0	0	0	0	0	0	2	14	0	16	24	1	1	0	26	1	1	1	0	3	45
01:45 PM	0	0	0	0	0	0	3	17	0	20	22	0	1	0	23	0	3	0	0	3	46
Total	0	0	0	0	0	0	9	63	0	72	92	1	2	1	96	2	9	1	0	12	180
02:00 PM	0	0	0	0	0	0	5	19	0	24	19	1	2	0	22	0	1	1	0	2	48
02:15 PM	0	2	0	0	2	0	3	15	0	18	25	0	1	0	26	1	2	0	0	3	49
02:30 PM	0	0	0	0	0	1	2	11	0	14	31	0	0	0	31	0	0	0	0	0	45
02:45 PM	0	0	0	0	0	0	3	15	0	18	34	0	0	0	34	0	2	0	0	2	54
Total	0	2	0	0	2	1	13	60	0	74	109	1	3	0	113	1	5	1	0	7	196
03:00 PM	3	3	1	0	7	1	3	25	0	29	35	2	0	0	37	0	4	0	0	4	77
03:15 PM	0	2	0	0	2	0	4	19	0	23	23	1	0	0	24	0	3	0	0	3	52
03:30 PM	0	2	0	0	2	0	2	21	0	23	21	0	0	0	21	0	3	0	0	3	49
03:45 PM	0	3	0	0	3	0	3	15	0	18	18	2	0	0	20	0	2	0	0	2	43
Total	3	10	1	0	14	1	12	80	0	93	97	5	0	0	102	0	12	0	0	12	221
04:00 PM	0	0	0	0	0	0	4	17	0	21	29	1	0	1	31	0	2	0	0	2	54
04:15 PM	0	0	0	0	0	0	3	13	0	16	21	3	0	0	24	0	2	0	0	2	42
04:30 PM	0	0	0	0	0	0	2	11	0	13	23	2	2	0	27	0	2	0	0	2	42
04:45 PM	0	0	0	0	0	0	2	13	0	15	15	0	0	0	15	0	1	0	0	1	31
Total	0	0	0	0	0	0	11	54	0	65	88	6	2	1	97	0	7	0	0	7	169
Grand Total	3	12	1	0	16	2	45	257	0	304	386	13	7	2	408	3	33	2	0	38	766
Apprch %	18.8	75.0	6.3	0.0		0.7	14.8	84.5	0.0		94.6	3.2	1.7	0.5		7.9	86.8	5.3	0.0		
Total %	0.4	1.6	0.1	0.0	2.1	0.3	5.9	33.6	0.0	39.7	50.4	1.7	0.9	0.3	53.3	0.4	4.3	0.3	0.0	5.0	

	CHRISTIE AVE. Southbound					65TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 01:00 PM to 04:45 PM - Peak 1 of 1																					
Intersection	02:45 PM																				
Volume	3	7	1	0	11	1	12	80	0	93	113	3	0	0	116	0	12	0	0	12	232
Percent	27.3	63.6	9.1	0.0		1.1	12.9	86.0	0.0		97.4	2.6	0.0	0.0		0.0	100.0	0.0	0.0		
03:00 Volume	3	3	1	0	7	1	3	25	0	29	35	2	0	0	37	0	4	0	0	4	77
Peak Factor																					0.753
High Int.	03:00 PM					03:00 PM					03:00 PM					03:00 PM					
Volume	3	3	1	0	7	1	3	25	0	29	35	2	0	0	37	0	4	0	0	4	
Peak Factor					0.393					0.802					0.784					0.750	


CHRISTIE AVE.
Out 4
In 11
Total 15
3 7 1 0
Right Thru Left Peds
North
9/16/2008 2:45:00 PM
9/16/2008 3:30:00 PM
Unshifted
Not Named
Total 27
In 12
Out 15
0 12 0 0
Left Thru Right Peds
65TH ST.
Out 126
In 93
Total 219
1 12 80 0
Right Thru Left Peds
Left Thru Right Peds
0 3 113 0
87 116 203
Out In Total
Not Named

All Traffic Data
(916) 771-8700
Fax 786-2879

EMERYVILLE MARKETPLACE

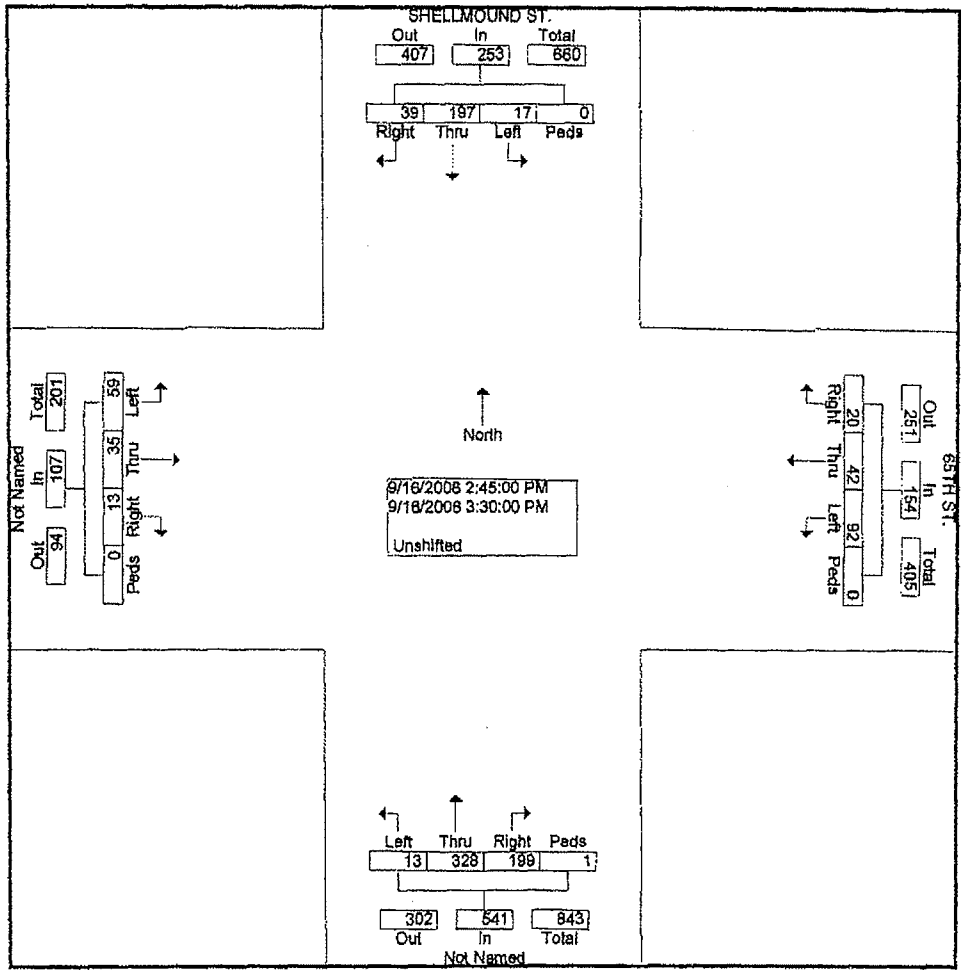
File Name : 65th-shellmond-F
Site Code : 00000000
Start Date : 9/16/2006
Page No : 1

Groups Printed- Unshifted

	SHELLMOUND ST. Southbound					65TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	3	53	3	0	59	4	9	23	0	36	45	81	1	0	127	2	1	3	0	6	228
01:15 PM	7	37	8	0	52	6	17	26	0	49	39	77	2	0	118	3	3	9	0	15	234
01:30 PM	4	51	5	0	60	5	3	18	0	26	43	79	4	0	126	1	4	7	0	12	224
01:45 PM	9	39	9	0	57	5	6	15	0	26	41	72	0	0	113	3	4	4	0	11	207
Total	23	180	25	0	228	20	35	82	0	137	168	309	7	0	484	9	12	23	0	44	893
02:00 PM	9	57	8	0	74	6	7	28	0	41	37	75	5	0	117	4	2	10	0	16	248
02:15 PM	6	49	2	0	57	5	15	24	0	44	40	71	0	0	111	1	11	11	0	23	235
02:30 PM	2	51	3	0	56	6	4	19	0	29	45	93	1	0	139	7	14	9	0	30	254
02:45 PM	11	53	2	0	66	5	12	18	0	35	49	70	5	0	124	5	5	21	0	31	256
Total	28	210	15	0	253	22	38	89	0	149	171	309	11	0	491	17	32	51	0	100	993
03:00 PM	8	48	6	0	62	5	14	24	0	43	45	77	5	1	128	2	11	7	0	20	253
03:15 PM	13	55	5	0	73	5	7	23	0	35	56	89	2	0	147	1	12	14	0	27	282
03:30 PM	7	41	4	0	52	5	9	27	0	41	49	92	1	0	142	5	7	17	0	29	264
03:45 PM	6	44	2	0	52	4	9	22	0	35	40	79	7	0	126	2	8	9	0	19	232
Total	34	188	17	0	239	19	39	96	0	154	190	337	15	1	543	10	38	47	0	95	1031
04:00 PM	6	49	6	0	61	4	11	27	0	42	54	81	3	0	138	10	7	12	0	29	270
04:15 PM	8	45	5	0	58	8	13	23	0	44	48	78	5	0	131	4	8	11	0	23	256
04:30 PM	3	49	8	0	60	7	8	17	0	32	43	79	2	0	124	5	14	9	0	28	244
04:45 PM	5	51	3	0	59	5	4	19	0	28	37	81	2	0	120	3	6	6	0	15	222
Total	22	194	22	0	238	24	36	86	0	146	182	319	12	0	513	22	35	38	0	95	992
Grand Total	107	772	79	0	958	85	148	353	0	586	711	1274	45	1	2031	58	117	159	0	334	3909
Apprch %	11.2	80.6	8.2	0.0		14.5	25.3	60.2	0.0		35.0	62.7	2.2	0.0		17.4	35.0	47.6	0.0		
Total %	2.7	19.7	2.0	0.0	24.5	2.2	3.8	9.0	0.0	15.0	18.2	32.6	1.2	0.0	52.0	1.5	3.0	4.1	0.0	8.5	

	SHELLMOUND ST. Southbound					65TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 01:00 PM to 04:45 PM - Peak 1 of 1																					
Intersection	02:45 PM																				
Volume	39	197	17	0	253	20	42	92	0	154	199	328	13	1	541	13	35	59	0	107	1055
Percent	15.4	77.9	6.7	0.0		13.0	27.3	59.7	0.0		36.8	60.6	2.4	0.2		12.1	32.7	55.1	0.0		
03:15 Volume	13	55	5	0	73	5	7	23	0	35	56	89	2	0	147	1	12	14	0	27	282
Peak Factor																					0.935
High Int.	03:15 PM					03:00 PM					03:15 PM					02:45 PM					
Volume	13	55	5	0	73	5	14	24	0	43	56	89	2	0	147	5	5	21	0	31	
Peak Factor					0.866					0.895					0.920					0.863	

4


SHELLMOUND ST.
Out 407
In 253
Total 660
39 197 17 0
Right Thru Left Peds
Not Named
Total 201
In 107
Out 94
59 35 13 0
Left Thru Right Peds
North
9/16/2006 2:45:00 PM
9/16/2006 3:30:00 PM
Unshifted
65TH ST.
Out 251
In 154
Total 405
20 42 92 0
Right Thru Left Peds
Left Thru Right Peds
13 328 199 1
302 Out
541 In
843 Total
Not Named

All Traffic Data
(916) 771-8700
Fax 786-2879

EMERY BAY MARKETPLACE

File Name : 64th-Christie-f
Site Code : 00000000
Start Date : 9/16/2006
Page No : 1

Groups Printed- Unshifted

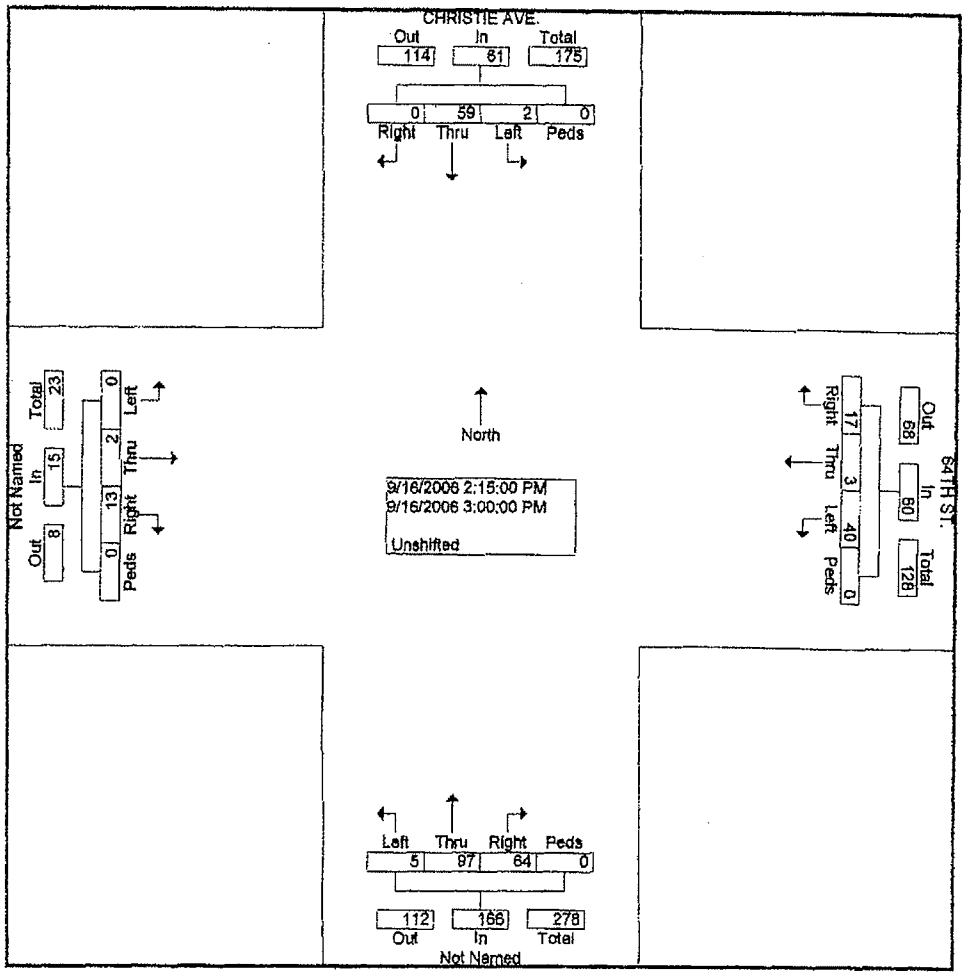
	CHRISTIE AVE. Southbound					64TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	0	22	0	0	22	2	0	9	0	11	15	34	1	0	50	2	1	1	0	4	87
01:15 PM	0	20	0	0	20	1	1	4	0	6	12	20	1	0	33	2	0	0	0	2	61
01:30 PM	1	14	2	0	17	3	0	9	0	12	18	24	1	0	43	2	1	0	0	3	75
01:45 PM	0	17	4	0	21	3	0	4	0	7	11	12	2	0	25	3	2	0	0	5	58
Total	1	73	6	0	80	9	1	26	0	36	56	90	5	0	151	9	4	1	0	14	281
02:00 PM	1	20	2	0	23	3	2	6	0	11	9	17	0	0	26	4	1	0	0	5	65
02:15 PM	0	15	0	0	15	3	0	12	0	15	10	23	1	0	34	2	0	0	0	2	66
02:30 PM	0	6	1	0	7	0	0	3	0	3	18	24	1	0	43	4	1	0	0	5	58
02:45 PM	0	16	0	0	16	9	3	15	0	27	16	29	3	0	48	5	1	0	0	6	97
Total	1	57	3	0	61	15	5	36	0	56	53	93	5	0	151	15	3	0	0	18	286
03:00 PM	0	22	1	0	23	5	0	10	0	15	20	21	0	0	41	2	0	0	0	2	81
03:15 PM	1	16	1	0	18	2	0	8	0	10	13	18	2	0	33	2	1	0	0	3	64
03:30 PM	1	14	0	0	15	4	0	3	0	7	7	22	1	0	30	2	1	0	0	3	55
03:45 PM	0	12	1	0	13	3	0	5	1	9	15	21	0	0	36	2	0	1	0	3	61
Total	2	64	3	0	69	14	0	26	1	41	55	82	3	0	140	8	2	1	0	11	261
04:00 PM	0	19	4	0	23	2	0	8	0	10	9	27	0	0	36	2	0	1	0	3	72
04:15 PM	0	14	4	0	18	3	0	7	0	10	6	23	0	0	29	4	1	0	0	5	62
04:30 PM	1	19	0	0	20	3	0	5	0	8	15	23	3	0	41	2	0	0	0	2	71
04:45 PM	0	14	1	0	15	1	0	6	0	7	12	18	3	0	33	4	2	1	0	7	62
Total	1	66	9	0	76	9	0	26	0	35	42	91	6	0	139	12	3	2	0	17	267
Grand Total	5	260	21	0	286	47	6	114	1	168	206	356	19	0	581	44	12	4	0	60	1095
Apprch %	1.7	90.9	7.3	0.0		28.0	3.6	67.9	0.6		35.5	61.3	3.3	0.0		73.3	20.0	6.7	0.0		
Total %	0.5	23.7	1.9	0.0	26.1	4.3	0.5	10.4	0.1	15.3	18.8	32.5	1.7	0.0	53.1	4.0	1.1	0.4	0.0	5.5	

	CHRISTIE AVE. Southbound					64TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 01:00 PM to 04:45 PM - Peak 1 of 1																					
Intersection	02:15 PM																				
Volume	0	59	2	0	61	17	3	40	0	60	64	97	5	0	166	13	2	0	0	15	302
Percent	0.0	96.7	3.3	0.0		28.3	5.0	66.7	0.0		38.6	58.4	3.0	0.0		86.7	13.3	0.0	0.0		
02:45 Volume	0	16	0	0	16	9	3	15	0	27	16	29	3	0	48	5	1	0	0	6	97
Peak Factor																					0.778
High Int.	03:00 PM					02:45 PM					02:45 PM					02:45 PM					
Volume	0	22	1	0	23	9	3	15	0	27	16	29	3	0	48	5	1	0	0	6	
Peak Factor					0.663					0.556					0.865					0.625	

7

All Traffic Data
(916) 771-8700
Fax 786-2879

File Name : 64th-Christie-f
Site Code : 00000000
Start Date : 9/16/2006
Page No : 2



7

All Traffic Data
(916) 771-8700
Fax 786-2879

EMERY BAY MARKETPLACE

File Name : 64th-shellmond-F
Site Code : 00000000
Start Date : 9/16/2006
Page No : 1

Groups Printed- Unshifted

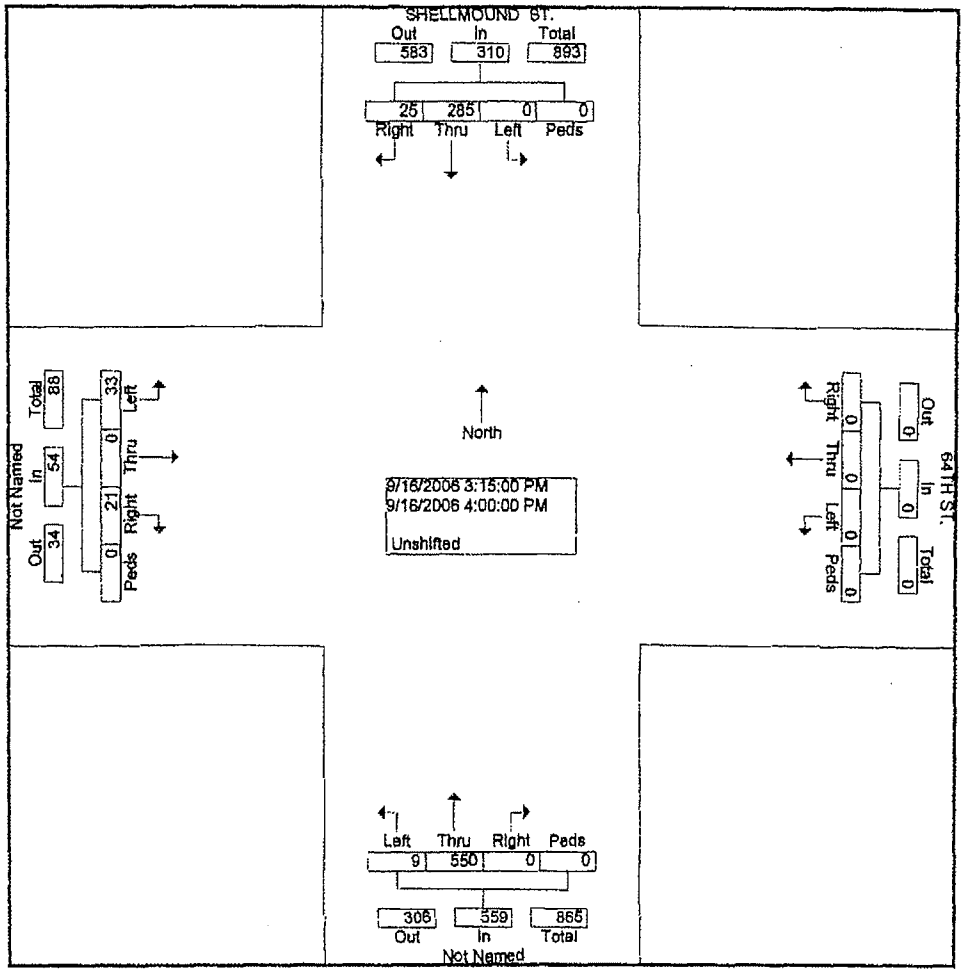
	SHELLMOUND ST. Southbound					64TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	6	76	0	0	82	0	0	0	0	0	0	120	2	0	122	1	0	16	0	17	221
01:15 PM	1	57	0	0	58	0	0	0	0	0	0	117	3	0	120	4	0	10	0	14	192
01:30 PM	4	72	0	0	76	0	0	0	0	0	0	121	4	0	125	6	0	13	0	19	220
01:45 PM	3	61	0	0	64	0	0	0	0	0	0	115	1	0	116	3	0	10	0	13	193
Total	14	266	0	0	280	0	0	0	0	0	0	473	10	0	483	14	0	49	0	63	826
02:00 PM	2	77	0	0	79	0	0	0	0	0	0	107	4	0	111	4	0	7	0	11	201
02:15 PM	9	67	0	0	76	0	0	0	0	0	0	111	2	0	113	7	0	9	0	16	205
02:30 PM	3	69	0	0	72	0	0	0	0	0	0	113	0	0	113	5	0	15	0	20	205
02:45 PM	9	72	0	0	81	0	0	0	0	0	0	119	16	0	135	3	0	20	0	23	239
Total	23	285	0	0	308	0	0	0	0	0	0	450	22	0	472	19	0	51	0	70	850
03:00 PM	7	73	0	0	80	0	0	0	0	0	0	111	3	0	114	3	0	0	0	3	197
03:15 PM	8	69	0	0	77	0	0	0	0	0	0	138	4	0	142	4	0	13	0	17	236
03:30 PM	7	55	0	0	62	0	0	0	0	0	0	130	2	0	132	5	0	7	0	12	206
03:45 PM	4	76	0	0	80	0	0	0	0	0	0	153	2	0	155	7	0	8	0	15	250
Total	26	273	0	0	299	0	0	0	0	0	0	532	11	0	543	19	0	28	0	47	889
04:00 PM	6	85	0	0	91	0	0	0	0	0	0	129	1	0	130	5	0	5	0	10	231
04:15 PM	3	60	0	0	63	0	0	0	0	0	0	111	1	0	112	6	0	6	0	12	187
04:30 PM	9	54	0	0	63	0	0	0	0	0	0	121	3	0	124	5	0	14	0	19	206
04:45 PM	1	77	0	0	78	0	0	0	0	0	0	127	5	0	132	5	0	8	0	13	223
Total	19	276	0	0	295	0	0	0	0	0	0	488	10	0	498	21	0	33	0	54	847
Grand Total	82	1100	0	0	1182	0	0	0	0	0	0	1943	53	0	1996	73	0	161	0	234	3412
Apprch %	6.9	93.1	0.0	0.0		0.0	0.0	0.0	0.0		0.0	97.3	2.7	0.0		31.2	0.0	68.8	0.0		
Total %	2.4	32.2	0.0	0.0	34.6	0.0	0.0	0.0	0.0	0.0	0.0	56.9	1.6	0.0	58.5	2.1	0.0	4.7	0.0	6.9	

	SHELLMOUND ST. Southbound					64TH ST. Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 01:00 PM to 04:45 PM - Peak 1 of 1																					
Intersection	03:15 PM																				
Volume	25	285	0	0	310	0	0	0	0	0	0	550	9	0	559	21	0	33	0	54	923
Percent	8.1	91.9	0.0	0.0		0.0	0.0	0.0	0.0		0.0	98.4	1.6	0.0		38.9	0.0	61.1	0.0		
03:45 Volume	4	76	0	0	80	0	0	0	0	0	0	153	2	0	155	7	0	8	0	15	250
Peak Factor																					0.923
High Int.	04:00 PM					12:45:00 PM					03:45 PM					03:15 PM					
Volume	6	85	0	0	91	0	0	0	0	0	0	153	2	0	155	4	0	13	0	17	
Peak Factor					0.852										0.902					0.794	

8

All Traffic Data
(916) 771-8700
Fax 786-2879

File Name : 64th-shellmond-F
Site Code : 00000000
Start Date : 9/16/2006
Page No : 2



8

Powell/Hollis - Vehicle 1-5PM

MD 01
EMERYVILLE
FPW C
TITO [916] 715 - 4006

Marks Traffic Data Service

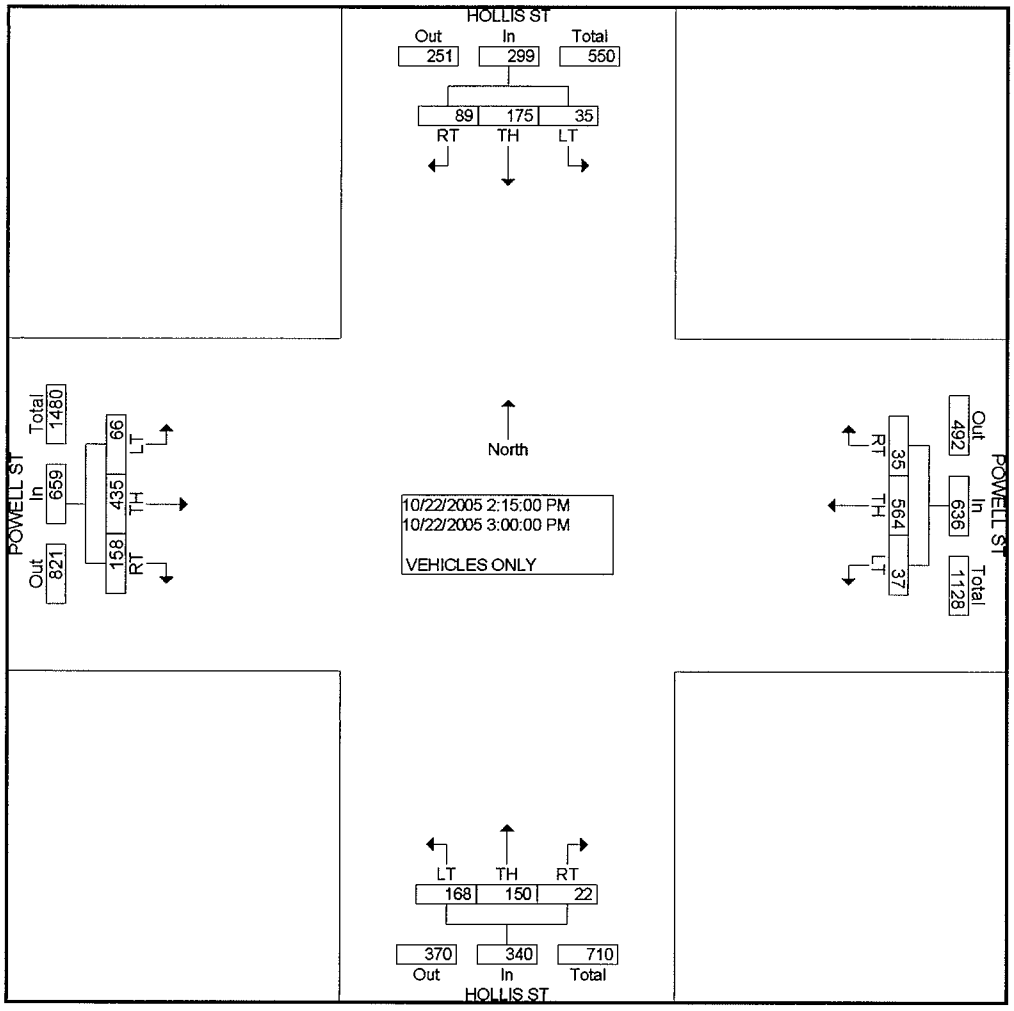
File Name : hollis-powell-p
Site Code : 00000000
Start Date : 10/22/2005
Page No : 1

Groups Printed- VEHICLES ONLY

	HOLLIS ST SouthBound					POWELL ST WestBound					HOLLIS ST NorthBound					POWELL ST EastBound							
Start Time	RT	TH	LT	PED	App. Total	RT	TH	LT	PED	App. Total	RT	TH	LT	PED	App. Total	RT	TH	LT	PED	App. Total	Excl u. Total	Inclu. Total	Int. Total
13:00	23	33	5	2	61	10	122	14	1	146	8	47	47	0	102	33	83	22	1	138	4	447	451
13:15	36	44	9	6	89	9	104	10	2	123	4	32	42	0	78	28	88	10	2	126	10	416	426
13:30	28	39	9	0	76	9	155	8	1	172	8	31	44	0	83	36	74	18	2	128	3	459	462
13:45	21	38	9	0	68	12	145	9	5	166	4	34	38	0	76	31	88	19	1	138	6	448	454
Total	108	154	32	8	294	40	526	41	9	607	24	144	171	0	339	128	333	69	6	530	23	1770	1793
14:00	34	37	7	2	78	12	131	5	5	148	4	42	51	1	97	27	88	10	0	125	8	448	456
14:15	18	34	7	4	59	6	144	12	0	162	6	46	40	0	92	42	128	20	1	190	5	503	508
14:30	24	55	6	2	85	9	165	14	2	188	2	34	52	1	88	40	97	16	4	153	9	514	523
14:45	28	36	8	0	72	10	127	7	0	144	6	34	34	0	74	34	89	10	0	133	0	423	423
Total	104	162	28	8	294	37	567	38	7	642	18	156	177	2	351	143	402	56	5	601	22	1888	1910
15:00	19	50	14	2	83	10	128	4	1	142	8	36	42	0	86	42	121	20	2	183	5	494	499
15:15	35	34	7	0	76	7	131	11	2	149	9	39	35	0	83	38	110	14	0	162	2	470	472
15:30	16	36	7	0	59	6	111	4	0	121	6	38	62	0	106	32	133	4	1	169	1	455	456
15:45	32	48	10	1	90	0	126	0	0	126	2	53	34	0	89	34	102	22	0	158	1	463	464
Total	102	168	38	3	308	23	496	19	3	538	25	166	173	0	364	146	466	60	3	672	9	1882	1891
16:00	36	22	8	0	66	6	130	10	0	146	6	28	50	0	84	34	128	28	0	190	0	486	486
16:15	23	35	14	1	72	5	118	10	0	133	4	40	46	0	90	36	126	18	1	180	2	475	477
16:30	18	32	4	0	54	10	124	9	0	143	8	31	49	0	88	32	135	22	0	189	0	474	474
16:45	20	34	6	0	60	5	121	6	0	132	4	32	51	0	87	34	134	20	0	188	0	467	467
Total	97	123	32	1	252	26	493	35	0	554	22	131	196	0	349	136	523	88	1	747	2	1902	1904
Grand Total	411	607	130	20	1148	126	2082	133	19	2341	89	597	717	2	1403	553	1724	273	15	2550	56	7442	7498
Apprch %	35.8	52.9	11.3			5.4	88.9	5.7			6.3	42.6	51.1			21.7	67.6	10.7					
Total %	5.5	8.2	1.7		15.4	1.7	28.0	1.8		31.5	1.2	8.0	9.6		18.9	7.4	23.2	3.7		34.3	0.7	99.3	

	HOLLIS ST SouthBound				POWELL ST WestBound				HOLLIS ST NorthBound				POWELL ST EastBound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour From 13:00 to 16:45 - Peak 1 of 1																	
Intersection	14:15																
Volume	89	175	35	299	35	564	37	636	22	150	168	340	158	435	66	659	1934
Percent	29.8	58.5	11.7		5.5	88.7	5.8		6.5	44.1	49.4		24.0	66.0	10.0		
14:30 Volume	24	55	6	85	9	165	14	188	2	34	52	88	40	97	16	153	514
Peak Factor																	0.941
High Int.	14:30				14:30				14:15				14:15				
Volume	24	55	6	85	9	165	14	188	6	46	40	92	42	128	20	190	
Peak Factor				0.879				0.846				0.924				0.867	

16


HOLLIS ST
Out 251
In 299
Total 550
89 175 35
RT TH LT
POWELL ST
Total 1480
In 659
Out 821
66 LT
435 TH
158 RT
North
10/22/2005 2:15:00 PM
10/22/2005 3:00:00 PM
VEHICLES ONLY
Out 492
In 636
Total 1128
RT 35
TH 564
LT 37
LT TH RT
168 150 22
370 Out
340 In
710 Total
HOLLIS ST

APPENDIX B:
LEVEL OF SERVICE CALCULATIONS

SYNCHRO LOS SHEETS
NO PROJECT ALTERNATIVE
EXISTING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3390		1770	3522		1770	3433		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3390		1770	3522		1770	3433		1770	1863	1583
Volume (vph)	500	775	303	102	616	20	84	168	42	59	177	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	329	111	670	22	91	183	46	64	192	202
RTOR Reduction (vph)	0	32	0	0	2	0	0	21	0	0	0	173
Lane Group Flow (vph)	543	1139	0	111	690	0	91	208	0	64	192	29
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	55.4		10.6	31.4		11.3	11.3		15.7	15.7	15.7
Effective Green, g (s)	34.6	56.4		10.6	32.4		11.3	11.3		15.7	15.7	15.7
Actuated g/C Ratio	0.31	0.51		0.10	0.29		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1738		171	1037		182	353		253	266	226
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.05	c0.06		0.04	c0.10	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.66		0.65	0.67		0.50	0.59		0.25	0.72	0.13
Uniform Delay, d1	37.3	19.7		47.9	34.0		46.7	47.1		41.9	45.1	41.2
Progression Factor	1.00	1.00		0.79	1.47		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	1.9		6.9	2.8		1.6	2.2		0.5	9.3	0.3
Delay (s)	68.8	21.6		45.0	53.0		48.2	49.3		42.5	54.3	41.4
Level of Service	E	C		D	D		D	D		D	D	D
Approach Delay (s)		36.6			51.9			49.0			47.0	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	43.0	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	72.7%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3447		1770	3503		1770	3465	
Flt Permitted	0.20	1.00			0.70		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	373	3458			2427		1770	3503		1770	3465	
Volume (vph)	70	670	121	39	521	103	130	484	35	113	613	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	42	566	112	141	526	38	123	666	108
RTOR Reduction (vph)	0	16	0	0	16	0	0	4	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	704	0	141	560	0	123	765	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.4	34.4			34.4		13.2	46.6		16.0	49.4	
Effective Green, g (s)	34.4	34.4			34.4		13.2	47.6		16.0	50.4	
Actuated g/C Ratio	0.31	0.31			0.31		0.12	0.43		0.15	0.46	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	117	1081			759		212	1516		257	1588	
v/s Ratio Prot		0.24					c0.08	0.16		0.07	c0.22	
v/s Ratio Perm	0.20				c0.29							
v/c Ratio	0.65	0.78			0.93		0.67	0.37		0.48	0.48	
Uniform Delay, d1	32.6	34.4			36.6		46.3	21.1		43.2	20.7	
Progression Factor	0.54	0.59			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.4	2.9			17.2		7.6	0.7		1.4	1.0	
Delay (s)	27.0	23.2			53.8		53.9	21.8		44.6	21.8	
Level of Service	C	C			D		D	C		D	C	
Approach Delay (s)		23.5			53.8			28.2			24.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	55	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	60	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	292	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	292	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	94	100	100	100
cM capacity (veh/h)	1542			1616			693	633	1079	599	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	62	1
Volume Left	0	84	2	0
Volume Right	2	1	60	0
cSH	1542	1616	1058	633
Volume to Capacity	0.00	0.05	0.06	0.00
Queue Length 95th (ft)	0	4	5	0
Control Delay (s)	0.0	4.4	8.6	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.6	10.7
Approach LOS			A	B

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	35	46	5	39	47	36	11	62	37	105	115	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	50	5	42	51	39	12	67	40	114	125	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	38	55	42	90	120	114	223
Volume Left (vph)	38	0	42	0	12	114	0
Volume Right (vph)	0	5	0	39	40	0	98
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.15	0.53	-0.27
Departure Headway (s)	6.4	5.8	6.3	5.5	5.4	5.8	5.0
Degree Utilization, x	0.07	0.09	0.07	0.14	0.18	0.18	0.31
Capacity (veh/h)	524	574	530	608	637	595	694
Control Delay (s)	8.6	8.2	8.6	8.2	9.5	8.9	9.0
Approach Delay (s)	8.4		8.3		9.5	9.0	
Approach LOS	A		A		A	A	

Intersection Summary				
Delay	8.9			
HCM Level of Service	A			
Intersection Capacity Utilization	30.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	188	0	0	122	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	204	0	0	133	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			204		337	204
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			204		337	204
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1367		659	836

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	204	133	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1367	1700
Volume to Capacity	0.12	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	13.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.99		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1696			1806		1770	1850		1770	1842	
Flt Permitted		0.94			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1611			1440		1770	1850		1770	1842	
Volume (vph)	33	51	132	37	35	4	36	271	13	23	385	30
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	55	143	40	38	4	39	295	14	25	418	33
RTOR Reduction (vph)	0	113	0	0	3	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	121	0	0	79	0	39	306	0	25	447	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		322			288		85	1003		32	943	
v/s Ratio Prot							c0.02	0.17		0.01	c0.24	
v/s Ratio Perm		c0.08			0.05							
v/c Ratio		0.38			0.27		0.46	0.31		0.78	0.47	
Uniform Delay, d1		17.3			16.9		23.2	6.3		24.5	7.9	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		0.5			0.4		2.8	0.8		72.6	1.7	
Delay (s)		17.8			17.3		23.6	8.4		97.1	9.6	
Level of Service		B			B		C	A		F	A	
Approach Delay (s)		17.8			17.3			10.1			14.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	13.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	48.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	54	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	59	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	118	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.11	0.00
Departure Headway (s)	4.2	4.5	4.1	4.3
Degree Utilization, x	0.01	0.11	0.14	0.11
Capacity (veh/h)	810	748	841	818
Control Delay (s)	7.2	8.1	7.8	7.8
Approach Delay (s)	7.2	8.1	7.8	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	13	17	16	114	133	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	18	17	124	145	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	318	159	174			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	318	159	174			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	667	886	1403			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	33	17	124	174
Volume Left	14	17	0	0
Volume Right	18	0	0	29
cSH	776	1403	1700	1700
Volume to Capacity	0.04	0.01	0.07	0.10
Queue Length 95th (ft)	3	1	0	0
Control Delay (s)	9.8	7.6	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.8	0.9		0.0
Approach LOS	A			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.98		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3399		3539	1583		3528
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3399		3539	1583		3280
Volume (vph)	223	30	268	102	17	234
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	33	291	111	18	254
RTOR Reduction (vph)	11	0	0	60	0	0
Lane Group Flow (vph)	264	0	291	51	0	272
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1564		1628	728		1509
v/s Ratio Prot	c0.08		0.08			
v/s Ratio Perm				0.03		c0.08
v/c Ratio	0.17		0.18	0.07		0.18
Uniform Delay, d1	15.8		15.9	15.1		15.9
Progression Factor	0.25		0.18	0.37		1.00
Incremental Delay, d2	0.2		0.2	0.2		0.3
Delay (s)	4.2		3.1	5.8		16.2
Level of Service	A		A	A		B
Approach Delay (s)	4.2		3.8			16.2
Approach LOS	A		A			B

Intersection Summary			
HCM Average Control Delay	7.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	59	15	223	149	56	78
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	16	242	162	61	85
RTOR Reduction (vph)	0	12	0	0	0	79
Lane Group Flow (vph)	64	4	242	162	61	6
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	7.9	25.3	13.9	85.1	67.7	7.9
Effective Green, g (s)	7.4	24.8	13.4	84.6	67.2	7.4
Actuated g/C Ratio	0.07	0.25	0.13	0.85	0.67	0.07
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	131	393	460	1576	1252	117
v/s Ratio Prot	c0.04	0.00	c0.07	c0.09	0.03	0.00
v/s Ratio Perm						
v/c Ratio	0.49	0.01	0.53	0.10	0.05	0.05
Uniform Delay, d1	44.5	28.3	40.3	1.3	5.6	43.0
Progression Factor	0.98	3.03	1.26	0.12	1.00	1.00
Incremental Delay, d2	2.8	0.0	1.1	0.1	0.1	0.2
Delay (s)	46.3	85.8	51.7	0.3	5.6	43.2
Level of Service	D	F	D	A	A	D
Approach Delay (s)	54.2			31.1	27.5	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	33.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	24.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1706		1770	3539	1583	1770	1794	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1706		1770	3539	1583	1770	1794	
Volume (vph)	5	21	16	523	79	0	88	34	561	60	218	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	568	86	0	96	37	610	65	237	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	23	1	318	336	0	96	37	610	65	303	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.7	2.7	2.7	16.8	16.8		4.4	16.4	55.1	3.7	15.7	
Effective Green, g (s)	2.2	2.2	2.2	16.8	16.8		3.9	16.9	55.1	3.2	16.2	
Actuated g/C Ratio	0.04	0.04	0.04	0.30	0.30		0.07	0.31	1.00	0.06	0.29	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	74	63	513	520		125	1085	1583	103	527	
v/s Ratio Prot	0.00	0.01		0.19	c0.20		c0.05	0.01		0.04	c0.17	
v/s Ratio Perm			0.00						c0.39			
v/c Ratio	0.07	0.31	0.01	0.62	0.65		0.77	0.03	0.39	0.63	0.57	
Uniform Delay, d1	25.5	25.7	25.4	16.4	16.6		25.2	13.4	0.0	25.4	16.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	1.9	2.4		22.0	0.0	0.7	8.9	1.2	
Delay (s)	25.6	26.6	25.4	18.3	19.0		47.2	13.4	0.7	34.3	17.8	
Level of Service	C	C	C	B	B		D	B	A	C	B	
Approach Delay (s)		26.0			18.7			7.3			20.6	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	14.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1012: Powell St & Frontage Rd — Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	675	0	0	0	615	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	734	0	0	0	668	0	139
RTOR Reduction (vph)	0	65	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	129	376	0	0	739	734	0	0	0	668	0	33
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	68.4			45.4	100.0				23.1		23.1
Effective Green, g (s)	19.0	68.4			45.4	100.0				23.6		23.6
Actuated g/C Ratio	0.19	0.68			0.45	1.00				0.24		0.24
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2252			1539	1441				810		374
v/s Ratio Prot	0.07	0.11			0.22					c0.19		
v/s Ratio Perm						c0.51						0.02
v/c Ratio	0.38	0.17			0.48	0.51				0.82		0.09
Uniform Delay, d1	35.4	5.6			19.1	0.0				36.2		29.8
Progression Factor	1.00	1.00			0.90	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	0.9				6.7		0.1
Delay (s)	35.7	5.8			17.9	0.9				42.9		29.9
Level of Service	D	A			B	A				D		C
Approach Delay (s)		12.6			9.4			0.0			40.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1013: Powell St & I-80 EB On-Ramp — Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1476	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1476	1504			
Volume (vph)	74	758	0	0	766	287	589	2	1030	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	824	0	0	833	312	640	2	1120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	212	0	108	59	0	0	0
Lane Group Flow (vph)	80	824	0	0	833	100	519	519	557	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	19.6	47.2			32.0	32.0	36.9	36.9	44.8			
Effective Green, g (s)	19.1	47.2			32.0	32.0	36.9	36.9	44.8			
Actuated g/C Ratio	0.19	0.47			0.32	0.32	0.37	0.37	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	2400			1484	507	620	545	674			
v/s Ratio Prot	0.05	c0.16			c0.18		0.31	c0.35	c0.37			
v/s Ratio Perm						0.06						
v/c Ratio	0.24	0.34			0.56	0.20	0.84	0.95	0.83			
Uniform Delay, d1	34.3	16.6			28.2	24.7	28.8	30.7	24.2			
Progression Factor	0.47	0.56			0.42	0.22	1.00	1.00	1.00			
Incremental Delay, d2	1.5	0.4			1.3	0.8	9.8	27.1	8.4			
Delay (s)	17.6	9.7			13.2	6.1	38.6	57.8	32.6			
Level of Service	B	A			B	A	D	E	C			
Approach Delay (s)		10.4			11.3			43.4			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1812	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1812	2628
Volume (vph)	364	1105	319	45	595	64	42	3	42	58	45	429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	396	1201	347	49	647	70	46	3	46	63	49	466
RTOR Reduction (vph)	0	0	168	0	0	16	0	0	43	0	0	201
Lane Group Flow (vph)	396	1201	179	49	647	54	24	25	3	0	112	265
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.4	41.1	52.2	6.8	26.5	26.5	7.6	7.6	7.6		30.5	50.9
Effective Green, g (s)	19.9	40.6	51.7	6.3	27.0	27.0	7.1	7.1	7.1		30.0	49.9
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	683	1376	745	112	956	427	119	120	112		544	1311
v/s Ratio Prot	0.12	c0.35	c0.12	0.03	c0.18		0.01	0.01			c0.06	0.10
v/s Ratio Perm						0.03			0.00			
v/c Ratio	0.58	0.87	0.24	0.44	0.68	0.13	0.20	0.21	0.03		0.21	0.20
Uniform Delay, d1	36.3	27.3	13.3	45.1	32.6	27.6	43.8	43.8	43.2		26.1	14.0
Progression Factor	1.15	0.54	0.36	0.75	0.68	0.62	1.00	1.00	1.00		1.31	3.85
Incremental Delay, d2	2.7	6.1	0.1	0.9	3.4	0.5	0.6	0.6	0.1		0.9	0.3
Delay (s)	44.5	20.9	4.9	34.8	25.6	17.6	44.4	44.4	43.3		35.0	54.1
Level of Service	D	C	A	C	C	B	D	D	D		C	D
Approach Delay (s)		22.9			25.5			43.9			50.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3525			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3525			1863	
Volume (vph)	35	26	200	6	0	20	0	334	9	0	76	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	363	10	0	83	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	371	0	0	83	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	3				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1502			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.11			0.04	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.25			0.13	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.4			22.7	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.35	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.4			0.4	
Delay (s)	17.0	17.0	14.7	47.7		47.0		18.8			31.0	
Level of Service	B	B	B	D		D		B			C	
Approach Delay (s)		15.2			47.1			18.8			31.0	
Approach LOS		B			D			B			C	

Intersection Summary				
HCM Average Control Delay	19.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.16			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3336		1770	3467		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3336		1770	3467		1770	1827		1770	1863	1583
Volume (vph)	355	336	208	34	383	60	206	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	365	226	37	416	65	224	188	28	28	153	101
RTOR Reduction (vph)	0	71	0	0	12	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	520	0	37	469	0	224	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	31.6	48.4		5.7	22.5		17.4	17.4		13.5	13.5	13.5
Effective Green, g (s)	31.1	48.9		5.2	23.0		16.9	16.9		13.0	13.0	13.0
Actuated g/C Ratio	0.31	0.49		0.05	0.23		0.17	0.17		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	550	1631		92	797		299	309		230	242	206
v/s Ratio Prot	c0.22	0.16		0.02	c0.14		c0.13	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.70	0.32		0.40	0.59		0.75	0.68		0.12	0.63	0.06
Uniform Delay, d1	30.4	15.5		45.9	34.3		39.5	39.0		38.5	41.2	38.2
Progression Factor	0.52	0.71		1.00	1.00		0.98	0.98		0.86	0.90	1.15
Incremental Delay, d2	2.4	0.3		2.9	3.2		9.8	6.0		0.2	5.2	0.1
Delay (s)	18.0	11.2		48.8	37.5		48.5	44.1		33.3	42.2	43.8
Level of Service	B	B		D	D		D	D		C	D	D
Approach Delay (s)		13.9			38.3			46.4			41.9	
Approach LOS		B			D			D			D	

Intersection Summary					
HCM Average Control Delay	29.6	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3355		1770	3509		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3355		1770	3509		1770	3479		1770	3498	
Volume (vph)	68	167	89	89	361	22	103	447	57	49	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	182	97	97	392	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	80	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	199	0	97	411	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	13.5		9.0	16.1		11.4	55.3		7.2	51.1	
Effective Green, g (s)	5.4	14.0		8.0	16.6		10.4	55.8		6.2	51.6	
Actuated g/C Ratio	0.05	0.14		0.08	0.17		0.10	0.56		0.06	0.52	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	470		142	582		184	1941		110	1805	
v/s Ratio Prot	0.04	0.06		c0.05	c0.12		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.42		0.68	0.71		0.61	0.28		0.48	0.39	
Uniform Delay, d1	46.7	39.3		44.8	39.4		42.9	11.6		45.3	14.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.6		12.7	3.9		5.6	0.4		3.3	0.6	
Delay (s)	77.6	39.9		57.5	43.3		48.5	11.9		48.6	15.3	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		47.8			46.0			18.1			17.6	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM Average Control Delay	28.8	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1018: 40th St & Horton St

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3456		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3456		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	164	30	43	294	61	39	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	178	33	47	320	66	42	58	33	3	25	10
RTOR Reduction (vph)	0	9	0	0	0	27	0	25	0	0	9	0
Lane Group Flow (vph)	26	202	0	47	320	39	42	66	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	56.3		5.4	58.5	58.5	10.4	10.4			13.4	
Effective Green, g (s)	2.7	56.3		4.9	58.5	58.5	9.9	9.9			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.10	0.10			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1946		87	2070	926	175	174			231	
v/s Ratio Prot	0.01	0.06		c0.03	c0.09		0.02	c0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.10		0.54	0.15	0.04	0.24	0.38			0.13	
Uniform Delay, d1	48.0	10.1		46.4	9.5	8.8	41.6	42.2			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	0.5	1.0			0.2	
Delay (s)	57.5	10.2		51.8	9.6	8.9	42.1	43.2			38.7	
Level of Service	E	B		D	A	A	D	D			D	
Approach Delay (s)		15.4			14.1			42.8			38.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1019: 40th St & Hollis St

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3438		1770	3539	1583	1770	1863	1583	1770	1841	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3438		1770	3539	1583	1770	1863	1583	1770	1841	
Volume (vph)	28	152	36	51	372	148	116	220	39	47	120	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	39	55	404	161	126	239	42	51	130	11
RTOR Reduction (vph)	0	16	0	0	0	79	0	0	34	0	3	0
Lane Group Flow (vph)	30	188	0	55	404	82	126	239	8	51	138	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	48.3		7.0	50.7	50.7	11.5	22.9	18.7	7.3	18.7	
Effective Green, g (s)	4.1	48.3		6.5	50.7	50.7	11.0	22.4	18.2	6.8	18.2	
Actuated g/C Ratio	0.04	0.48		0.06	0.51	0.51	0.11	0.22	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1661		115	1794	803	195	417	288	120	335	
v/s Ratio Prot	0.02	0.05		c0.03	c0.11		c0.07	c0.13		0.03	0.07	
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.41	0.11		0.48	0.23	0.10	0.65	0.57	0.03	0.42	0.41	
Uniform Delay, d1	46.8	14.1		45.1	13.7	12.8	42.6	34.5	33.6	44.7	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.06	0.92	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.3	6.4	1.6	0.0	1.8	0.6	
Delay (s)	49.5	14.3		47.4	14.0	13.1	49.0	36.1	33.6	49.1	34.0	
Level of Service	D	B		D	B	B	D	D	C	D	C	
Approach Delay (s)		18.8			16.7			39.8			38.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	196	16	90	545	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	213	17	98	592	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	615			230			768	1085	115	1046	1082	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	615			230			768	1085	115	1046	1082	308
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			89	93	91	99	98	100
cM capacity (veh/h)	960			1335			265	194	915	146	195	688

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	142	88	98	395	220	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	960	1700	1700	1335	1700	1700	247	704	196
Volume to Capacity	0.03	0.08	0.05	0.07	0.23	0.13	0.14	0.12	0.03
Queue Length 95th (ft)	2	0	0	6	0	0	12	11	3
Control Delay (s)	8.9	0.0	0.0	7.9	0.0	0.0	22.0	10.8	24.0
Lane LOS	A			A			C	B	C
Approach Delay (s)	0.9			1.1			14.0		24.0
Approach LOS							B		C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.98			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3497		1770	3484			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3497		1770	3484			850	1583		1568	
Volume (vph)	3	242	21	69	460	53	85	66	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	263	23	75	500	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	5	0	0	6	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	281	0	75	552	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.2		7.5	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.2		7.0	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.49		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1721		124	1944			183	340		99	
v/s Ratio Prot	0.00	c0.08		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.16		0.60	0.28			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.0		45.2	11.6			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.04	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		5.8	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.2		52.6	7.3			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.7			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM Average Control Delay	24.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	42.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3404		1770	3371		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3404		1770	3371		3433	3533		1770	3500	
Volume (vph)	92	200	68	29	294	137	228	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	217	74	32	320	149	248	776	9	147	736	59
RTOR Reduction (vph)	0	39	0	0	58	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	252	0	32	411	0	248	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	17.0		8.8	17.0		15.0	48.8		12.4	46.2	
Effective Green, g (s)	7.8	16.0		7.8	16.0		14.0	48.8		11.4	46.2	
Actuated g/C Ratio	0.08	0.16		0.08	0.16		0.14	0.49		0.11	0.46	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	545		138	539		481	1724		202	1617	
v/s Ratio Prot	c0.06	0.07		0.02	c0.12		0.07	c0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.46		0.23	0.76		0.52	0.46		0.73	0.49	
Uniform Delay, d1	45.1	38.1		43.3	40.2		39.9	16.8		42.8	18.7	
Progression Factor	1.27	1.27		1.18	1.17		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.6	0.4		0.3	5.6		0.4	0.9		10.5	1.1	
Delay (s)	71.7	48.9		51.3	52.8		40.2	17.7		53.3	19.8	
Level of Service	E	D		D	D		D	B		D	B	
Approach Delay (s)		54.8			52.7			23.1			25.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3487		1770	3484			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3487		1770	3484			3189			2945	
Volume (vph)	48	271	29	6	389	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	295	32	7	423	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	315	0	7	458	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2043		21	1916			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.13							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.15		0.33	0.24			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.8			18.3			19.3	
Progression Factor	0.50	1.48		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.0	7.1		27.9	6.1			18.5			20.8	
Level of Service	B	A		C	A			B			C	
Approach Delay (s)		8.9			6.4			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	91	50	2	8	67	26	2	1	2	16	4	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	54	2	9	73	28	2	1	2	17	4	72

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	99	57	110	5	93
Volume Left (vph)	99	0	9	2	17
Volume Right (vph)	0	2	28	2	72
Hadj (s)	0.53	0.01	-0.10	-0.13	-0.39
Departure Headway (s)	5.3	4.8	4.3	4.5	4.1
Degree Utilization, x	0.15	0.08	0.13	0.01	0.11
Capacity (veh/h)	660	725	814	743	811
Control Delay (s)	8.1	7.0	7.9	7.5	7.6
Approach Delay (s)	7.7		7.9	7.5	7.6
Approach LOS	A		A	A	A

Intersection Summary				
Delay	7.7			
HCM Level of Service	A			
Intersection Capacity Utilization	24.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.18	0.18			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	

Intersection Summary						
HCM Average Control Delay	23.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	45.6	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	36.8%	ICU Level of Service		A		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3504			3478	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3504			3478	
Volume (vph)	51	103	9	77	117	20	0	867	62	0	688	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	942	67	0	748	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1005	0	0	839	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2295	
v/s Ratio Prot					c0.07			c0.29			0.24	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.43			0.37	
Uniform Delay, d1		44.2			44.1			8.5			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.1			8.4	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.1			8.4	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3534			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3292			5073	
Volume (vph)	0	0	0	65	296	663	12	423	0	0	672	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	460	0	0	730	12
RTOR Reduction (vph)	0	0	0	0	0	255	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	466	0	473	0	0	740	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					31.2	31.2		59.8			59.8	
Effective Green, g (s)					31.2	31.2		60.8			60.8	
Actuated g/C Ratio					0.31	0.31		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1094	494		2002			3084	
v/s Ratio Prot					0.11						c0.15	
v/s Ratio Perm						c0.29		0.14				
v/c Ratio					0.36	0.94		0.24			0.24	
Uniform Delay, d1					26.7	33.6		9.0			9.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	26.7		0.3			0.2	
Delay (s)					26.7	60.2		9.2			9.2	
Level of Service					C	E		A			A	
Approach Delay (s)		0.0			48.4			9.2			9.2	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Exist AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3478		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3478		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	417	54	221	484	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	453	59	240	526	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	504	0	240	526	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						38.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1943		495	2690	
v/s Ratio Prot		c0.06						c0.14		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.26		0.48	0.20	
Uniform Delay, d1		28.4						8.0		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.3	0.0	
Delay (s)		28.7						8.3		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.3			10.4	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	35.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3447		1770	3504		1770	3420		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3447		1770	3504		1770	3420		1770	1863	1583
Volume (vph)	263	614	130	105	745	52	167	399	116	130	251	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	141	114	810	57	182	434	126	141	273	501
RTOR Reduction (vph)	0	15	0	0	4	0	0	25	0	0	0	321
Lane Group Flow (vph)	286	793	0	114	863	0	182	535	0	141	273	180
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	42.6		11.5	33.7		19.4	19.4		19.5	19.5	19.5
Effective Green, g (s)	20.4	43.6		11.5	34.7		19.4	19.4		19.5	19.5	19.5
Actuated g/C Ratio	0.19	0.40		0.10	0.32		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1366		185	1105		312	603		314	330	281
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.10	c0.16		0.08	c0.15	
v/s Ratio Perm												0.11
v/c Ratio	0.87	0.58		0.62	0.78		0.58	0.89		0.45	0.83	0.64
Uniform Delay, d1	43.5	26.0		47.1	34.2		41.6	44.2		40.4	43.6	42.0
Progression Factor	1.00	1.00		1.34	0.66		0.99	0.99		1.00	1.00	1.00
Incremental Delay, d2	21.5	1.8		4.8	4.4		2.0	13.1		1.0	15.5	4.9
Delay (s)	65.1	27.8		67.9	26.9		43.0	57.0		41.5	59.1	46.9
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		37.6			31.7			53.6			49.7	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3437		1770	3498		1770	3469	
Flt Permitted	0.14	1.00			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	260	3426			3031		1770	3498		1770	3469	
Volume (vph)	96	588	159	16	608	142	172	883	74	181	767	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	17	661	154	187	960	80	197	834	127
RTOR Reduction (vph)	0	27	0	0	21	0	0	4	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	811	0	187	1036	0	197	952	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.5	34.5			34.5		15.2	47.5		15.0	47.3	
Effective Green, g (s)	34.5	34.5			34.5		15.2	48.5		15.0	48.3	
Actuated g/C Ratio	0.31	0.31			0.31		0.14	0.44		0.14	0.44	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	82	1075			951		245	1542		241	1523	
v/s Ratio Prot		0.23					c0.11	c0.30		c0.11	0.27	
v/s Ratio Perm	c0.40				0.27							
v/c Ratio	1.27	0.73			0.85		0.76	0.67		0.82	0.63	
Uniform Delay, d1	37.7	33.6			35.4		45.7	24.4		46.2	23.9	
Progression Factor	1.05	1.05			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	177.6	2.0			7.5		13.2	2.3		18.9	1.9	
Delay (s)	217.4	37.4			42.8		58.8	26.8		65.1	25.8	
Level of Service	F	D			D		E	C		E	C	
Approach Delay (s)		57.9			42.8			31.7			32.5	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM Average Control Delay	39.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	133	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	145	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	452	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	452	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	86	100	100	100
cM capacity (veh/h)	1598			1595			603	556	1057	418	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	148	2
Volume Left	1	133	2	1
Volume Right	0	0	145	0
cSH	1598	1595	1039	477
Volume to Capacity	0.00	0.08	0.14	0.00
Queue Length 95th (ft)	0	7	12	0
Control Delay (s)	0.4	6.6	9.0	12.6
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.0	12.6
Approach LOS			A	B

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	29.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	94	78	6	119	85	106	10	354	201	16	129	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	85	7	129	92	115	11	385	218	17	140	72

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	102	91	129	208	614	17	212
Volume Left (vph)	102	0	129	0	11	17	0
Volume Right (vph)	0	7	0	115	218	0	72
Hadj (s)	0.53	-0.02	0.53	-0.35	-0.18	0.53	-0.20
Departure Headway (s)	8.3	7.7	8.0	7.1	6.5	7.8	7.1
Degree Utilization, x	0.23	0.20	0.29	0.41	1.11	0.04	0.42
Capacity (veh/h)	418	448	438	495	558	442	489
Control Delay (s)	12.6	11.4	12.9	13.7	95.2	9.9	13.9
Approach Delay (s)	12.0		13.4		95.2	13.6	
Approach LOS	B		B		F	B	

Intersection Summary				
Delay	49.8			
HCM Level of Service	E			
Intersection Capacity Utilization	65.5%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	295	0	0	310	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	321	0	0	337	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			321		658	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			321		658	321
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1239		429	720

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	321	337	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1239	1700
Volume to Capacity	0.19	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	19.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1756			1788		1770	1843		1770	1762	
Flt Permitted		0.83			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1492			1577		1770	1843		1770	1762	
Volume (vph)	128	137	68	36	78	20	163	604	39	19	317	112
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	149	74	39	85	22	177	657	42	21	345	122
RTOR Reduction (vph)	0	17	0	0	11	0	0	4	0	0	23	0
Lane Group Flow (vph)	0	345	0	0	135	0	177	695	0	21	444	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.3			16.3		7.5	25.8		1.4	19.7	
Effective Green, g (s)		15.8			15.8		7.0	26.3		0.9	20.2	
Actuated g/C Ratio		0.29			0.29		0.13	0.48		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		429			453		225	881		29	647	
v/s Ratio Prot							c0.10	c0.38		0.01	0.25	
v/s Ratio Perm		c0.23			0.09							
v/c Ratio		0.80			0.30		0.79	0.79		0.72	0.69	
Uniform Delay, d1		18.2			15.3		23.3	12.0		26.9	14.7	
Progression Factor		1.00			1.00		0.90	1.04		0.98	1.05	
Incremental Delay, d2		10.2			0.3		13.4	6.0		53.8	5.2	
Delay (s)		28.3			15.5		34.4	18.5		80.1	20.7	
Level of Service		C			B		C	B		F	C	
Approach Delay (s)		28.3			15.5			21.7			23.2	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	137	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	149	72	5	128	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	68	239	135
Volume Left (vph)	4	57	18	5
Volume Right (vph)	64	12	72	1
Hadj (s)	-0.42	0.09	-0.13	0.04
Departure Headway (s)	4.4	5.0	4.3	4.6
Degree Utilization, x	0.10	0.09	0.29	0.17
Capacity (veh/h)	738	664	804	745
Control Delay (s)	7.9	8.5	9.0	8.5
Approach Delay (s)	7.9	8.5	9.0	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.6		
HCM Level of Service	A		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	46	32	16	509	232	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	35	17	553	252	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	854	266	280			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	854	266	280			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	95	99			
cM capacity (veh/h)	324	772	1282			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	85	17	553	280
Volume Left	50	17	0	0
Volume Right	35	0	0	28
cSH	426	1282	1700	1700
Volume to Capacity	0.20	0.01	0.33	0.16
Queue Length 95th (ft)	18	1	0	0
Control Delay (s)	15.5	7.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.5	0.2		0.0
Approach LOS	C			

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	38.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3388		3539	1488		3525
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3388		3539	1488		3244
Volume (vph)	590	57	361	117	24	405
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	62	392	127	26	440
RTOR Reduction (vph)	7	0	0	69	0	0
Lane Group Flow (vph)	696	0	392	58	0	466
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1602		1609	676		1475
v/s Ratio Prot	c0.21		0.11			
v/s Ratio Perm				0.04		c0.14
v/c Ratio	0.43		0.24	0.09		0.32
Uniform Delay, d1	19.2		18.4	17.0		19.1
Progression Factor	0.58		0.15	0.00		1.00
Incremental Delay, d2	0.8		0.3	0.2		0.6
Delay (s)	11.9		3.0	0.2		19.7
Level of Service	B		A	A		B
Approach Delay (s)	11.9		2.3			19.7
Approach LOS	B		A			B

Intersection Summary					
HCM Average Control Delay	11.1	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	100	34	472	594	186	175
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	37	513	646	202	190
RTOR Reduction (vph)	0	23	0	0	0	128
Lane Group Flow (vph)	109	14	513	646	202	62
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	11.5	42.1	27.1	91.5	60.9	11.5
Effective Green, g (s)	11.0	41.6	26.6	91.0	60.4	11.0
Actuated g/C Ratio	0.10	0.38	0.24	0.83	0.55	0.10
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	599	830	1541	1023	158
v/s Ratio Prot	c0.06	0.01	c0.15	c0.35	0.11	0.04
v/s Ratio Perm						
v/c Ratio	0.62	0.02	0.62	0.42	0.20	0.39
Uniform Delay, d1	47.5	21.5	37.2	2.5	12.5	46.4
Progression Factor	0.58	0.09	1.06	0.25	1.00	1.00
Incremental Delay, d2	6.2	0.0	1.1	0.7	0.4	1.6
Delay (s)	33.9	1.9	40.5	1.3	13.0	48.0
Level of Service	C	A	D	A	B	D
Approach Delay (s)	25.8			18.7	29.9	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	21.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	52.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1691		1770	3539	1583	1770	1825	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1691		1770	3539	1583	1770	1825	
Volume (vph)	172	370	60	397	14	0	11	639	1058	252	516	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	432	15	0	12	695	1150	274	561	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	218	229	0	12	695	1150	274	609	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.5	16.5	16.5	15.9	15.9		1.1	22.6	86.8	16.3	37.8	
Effective Green, g (s)	16.0	16.0	16.0	15.9	15.9		0.6	23.1	86.8	15.8	38.3	
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18		0.01	0.27	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	326	343	292	308	310		12	942	1583	322	805	
v/s Ratio Prot	0.11	c0.22		0.13	0.14		0.01	0.20		c0.15	0.33	
v/s Ratio Perm			0.03						c0.73			
v/c Ratio	0.57	1.17	0.16	0.71	0.74		1.00	0.74	0.73	0.85	0.76	
Uniform Delay, d1	32.3	35.4	29.8	33.3	33.5		43.1	29.1	0.0	34.4	20.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	104.0	0.1	6.7	8.4		259.8	2.9	2.9	18.3	3.9	
Delay (s)	33.8	139.4	29.9	40.0	41.9		302.9	32.0	2.9	52.7	24.2	
Level of Service	C	F	C	D	D		F	C	A	D	C	
Approach Delay (s)		98.3			41.0			15.7			33.0	
Approach LOS		F			D			B			C	

Intersection Summary				
HCM Average Control Delay	36.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	78.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			3016	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			3016	1399				3433		1583
Volume (vph)	140	394	572	0	521	1469	0	0	0	685	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	1597	0	0	0	745	0	359
RTOR Reduction (vph)	0	201	0	0	139	0	0	0	0	0	0	265
Lane Group Flow (vph)	152	849	0	0	962	1062	0	0	0	745	0	94
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	73.1			49.1	110.0				28.4		28.4
Effective Green, g (s)	20.0	73.1			49.1	110.0				28.9		28.9
Actuated g/C Ratio	0.18	0.66			0.45	1.00				0.26		0.26
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2143			1346	1399				902		416
v/s Ratio Prot	0.09	0.26			0.32							0.06
v/s Ratio Perm						c0.76				0.22		
v/c Ratio	0.47	0.40			0.71	0.76				0.83		0.23
Uniform Delay, d1	40.3	8.4			24.8	0.0				38.2		31.8
Progression Factor	1.00	1.00			0.60	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.0	1.2				6.1		0.2
Delay (s)	40.7	9.0			15.8	1.2				44.3		32.0
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.0			8.6			0.0			40.3	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	17.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1529	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1529	659			
Volume (vph)	141	938	0	0	1440	456	550	226	852	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1020	0	0	1565	496	598	246	926	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	62	20	0	0	0
Lane Group Flow (vph)	153	1020	0	0	1565	233	598	647	443	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	514	335			
v/s Ratio Prot	0.09	c0.29			c0.34		0.36	0.42	c0.67			
v/s Ratio Perm						0.17						
v/c Ratio	0.45	0.69			0.93	0.48	1.06	1.26	1.32			
Uniform Delay, d1	39.4	26.1			33.6	26.9	36.5	36.5	27.0			
Progression Factor	1.55	0.39			0.94	1.31	1.00	1.00	1.00			
Incremental Delay, d2	3.5	2.1			7.1	2.1	54.3	131.7	164.4			
Delay (s)	64.7	12.3			38.6	37.3	90.8	168.2	191.4			
Level of Service	E	B			D	D	F	F	F			
Approach Delay (s)		19.2			38.3			148.1			0.0	
Approach LOS		B			D			F			A	

Intersection Summary				
HCM Average Control Delay	72.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1817	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1817	2628
Volume (vph)	354	765	671	259	989	145	132	16	66	163	163	660
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	385	832	729	282	1075	158	143	17	72	177	177	717
RTOR Reduction (vph)	0	7	140	0	0	20	0	0	63	0	0	85
Lane Group Flow (vph)	385	918	496	282	1075	138	78	82	9	0	354	632
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		496	1123
v/s Ratio Prot	0.11	0.28	c0.41	0.16	c0.30		0.05	0.05			c0.19	0.24
v/s Ratio Perm						0.09			0.01			
v/c Ratio	0.73	0.92	0.88	1.03	1.01	0.29	0.36	0.38	0.05		0.71	0.56
Uniform Delay, d1	44.3	37.2	26.7	46.5	38.5	29.5	43.9	44.0	42.1		36.1	23.8
Progression Factor	1.25	0.94	0.94	1.00	1.00	1.00	1.02	1.02	2.14		0.68	0.23
Incremental Delay, d2	2.6	5.4	5.0	62.1	30.7	1.5	0.7	0.8	0.1		8.0	1.9
Delay (s)	58.0	40.4	30.1	108.6	69.2	31.1	45.7	45.8	90.1		32.6	7.5
Level of Service	E	D	C	F	E	C	D	D	F		C	A
Approach Delay (s)		40.5			72.5			59.5			15.8	
Approach LOS		D			E			E			B	

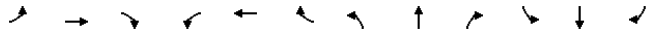
Intersection Summary				
HCM Average Control Delay	46.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3522			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3522			1863	
Volume (vph)	74	143	711	47	0	97	0	895	25	0	220	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	973	27	0	239	0
RTOR Reduction (vph)	0	0	414	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	359	51	0	7	0	998	0	0	239	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.13	c0.03				c0.28			0.13	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.28	0.42		0.07		0.62			0.36	
Uniform Delay, d1	23.1	23.0	18.1	49.2		48.0		22.8			26.0	
Progression Factor	1.23	1.22	3.55	1.00		1.00		1.00			1.40	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		1.8			1.5	
Delay (s)	28.9	28.4	64.3	50.9		48.2		24.7			37.8	
Level of Service	C	C	E	D		D		C			D	
Approach Delay (s)		56.0			49.1			24.7			37.8	
Approach LOS		E			D			C			D	

Intersection Summary				
HCM Average Control Delay	40.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3438		1770	3465		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3438		1770	3465		1770	1843		1770	1863	1537
Volume (vph)	169	669	112	20	553	55	466	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	727	122	22	601	60	507	455	29	63	215	170
RTOR Reduction (vph)	0	11	0	0	7	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	838	0	22	654	0	507	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	11.7	31.6		2.6	22.5		44.8	44.8		16.0	16.0	16.0
Effective Green, g (s)	11.2	32.1		2.1	23.0		44.3	44.3		15.5	15.5	15.5
Actuated g/C Ratio	0.10	0.29		0.02	0.21		0.40	0.40		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	180	1003		34	725		713	742		249	263	217
v/s Ratio Prot	c0.10	0.24		0.01	c0.19		c0.29	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.02	0.84		0.65	0.90		0.71	0.65		0.25	0.82	0.11
Uniform Delay, d1	49.4	36.5		53.6	42.4		27.5	26.6		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.99	0.99		1.07	1.04	1.76
Incremental Delay, d2	73.0	8.2		35.3	16.6		3.3	2.0		0.5	16.7	0.2
Delay (s)	122.4	44.7		88.8	59.0		30.4	28.4		45.6	64.3	72.9
Level of Service	F	D		F	E		C	C		D	E	E
Approach Delay (s)		58.5			60.0			29.4			64.9	
Approach LOS		E			E			C			E	

Intersection Summary				
HCM Average Control Delay	50.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3407		1770	3462		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3407		1770	3462		1770	3483		1770	3483	
Volume (vph)	128	559	186	100	358	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	608	202	109	389	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	36	0	0	16	0	0	9	0	0	9	0
Lane Group Flow (vph)	139	774	0	109	439	0	152	1180	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.0		8.4	22.0		11.9	32.6		10.0	30.7	
Effective Green, g (s)	9.4	24.5		7.4	22.5		10.9	33.1		9.0	31.2	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.12	0.37		0.10	0.35	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	927		146	866		214	1281		177	1207	
v/s Ratio Prot	c0.08	c0.23		0.06	0.13		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.83		0.75	0.51		0.71	0.92		0.69	0.86	
Uniform Delay, d1	39.2	30.8		40.4	29.0		38.0	27.2		39.1	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	6.6		18.6	0.5		10.6	12.2		10.6	8.4	
Delay (s)	54.9	37.4		59.0	29.5		48.6	39.4		49.8	35.8	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		40.0			35.2			40.4			37.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	38.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1018: 40th St & Horton St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3402		1770	3539	1524	1770	1684			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3402		1770	3539	1524	1770	1684			1805	
Volume (vph)	24	586	168	80	587	27	173	106	108	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	637	183	87	638	29	188	115	117	46	115	21
RTOR Reduction (vph)	0	19	0	0	0	14	0	42	0	0	5	0
Lane Group Flow (vph)	26	801	0	87	638	15	188	190	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	45.4		7.9	50.1	50.1	16.5	16.5			15.7	
Effective Green, g (s)	2.7	45.4		7.4	50.1	50.1	16.0	16.0			15.2	
Actuated g/C Ratio	0.03	0.45		0.07	0.50	0.50	0.16	0.16			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1545		131	1773	764	283	269			274	
v/s Ratio Prot	0.01	c0.24		c0.05	0.18		0.11	c0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.52		0.66	0.36	0.02	0.66	0.71			0.65	
Uniform Delay, d1	48.0	19.5		45.1	15.2	12.6	39.5	39.8			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.2		10.8	0.6	0.0	5.2	7.6			4.6	
Delay (s)	57.5	20.7		55.9	15.8	12.6	44.7	47.4			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		21.9			20.3			46.2			44.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	27.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1019: 40th St & Hollis St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3426		1770	3539	1496	1770	1863	1520	1770	1811	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3426		1770	3539	1496	1770	1863	1520	1770	1811	
Volume (vph)	46	544	114	141	498	143	179	271	115	147	300	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	124	153	541	155	195	295	125	160	326	55
RTOR Reduction (vph)	0	16	0	0	0	89	0	0	95	0	7	0
Lane Group Flow (vph)	50	699	0	153	541	66	195	295	30	160	374	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	37.1		12.3	42.7	42.7	12.5	24.4	24.4	11.7	23.6	
Effective Green, g (s)	6.2	37.1		11.8	42.7	42.7	12.0	23.9	23.9	11.2	23.1	
Actuated g/C Ratio	0.06	0.37		0.12	0.43	0.43	0.12	0.24	0.24	0.11	0.23	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1271		209	1511	639	212	445	363	198	418	
v/s Ratio Prot	0.03	c0.20		c0.09	0.15		c0.11	0.16		0.09	c0.21	
v/s Ratio Perm						0.04			0.02			
v/c Ratio	0.45	0.55		0.73	0.36	0.10	0.92	0.66	0.08	0.81	0.89	
Uniform Delay, d1	45.3	24.9		42.6	19.4	17.2	43.5	34.4	29.5	43.4	37.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.97	
Incremental Delay, d2	2.2	1.7		11.7	0.7	0.3	39.7	3.3	0.1	19.8	20.3	
Delay (s)	47.4	26.6		54.3	20.0	17.5	83.2	37.7	29.6	61.6	56.4	
Level of Service	D	C		D	C	B	F	D	C	E	E	
Approach Delay (s)		27.9			25.8			50.5			57.9	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM Average Control Delay	38.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	730	44	96	775	12	33	12	98	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	793	48	104	842	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	855			841			1509	1929	421	1615	1947	428
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	855			841			1509	1929	421	1615	1947	428
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			87			43	76	82	100	84	98
cM capacity (veh/h)	780			790			63	55	581	41	54	575

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	529	312	104	562	294	42	113	18
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	780	1700	1700	790	1700	1700	62	375	103
Volume to Capacity	0.03	0.31	0.18	0.13	0.33	0.17	0.69	0.30	0.18
Queue Length 95th (ft)	2	0	0	11	0	0	74	31	15
Control Delay (s)	9.8	0.0	0.0	10.3	0.0	0.0	145.0	18.7	47.2
Lane LOS	A			B			F	C	E
Approach Delay (s)	0.3			1.1			53.1		47.2
Approach LOS							F		E

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3447		1770	3479			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3447		1770	3479			1808	1555		1811	
Volume (vph)	30	738	101	124	696	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	802	110	135	757	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	9	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	903	0	135	814	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	37.5		11.4	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.5		10.9	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.08	0.38		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1293		193	1399			380	327		264	
v/s Ratio Prot	0.02	c0.26		c0.08	0.23			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.70		0.70	0.58			0.86	0.22		0.71	
Uniform Delay, d1	42.9	26.5		43.0	23.3			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.18	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	3.2		4.2	0.7			17.8	0.3		7.8	
Delay (s)	43.5	29.6		55.1	15.2			55.9	33.0		48.4	
Level of Service	D	C		E	B			E	C		D	
Approach Delay (s)		30.1			20.8			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	31.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3299		1770	3367		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3299		1770	3367		3433	3529		1770	3467	
Volume (vph)	205	518	280	46	381	146	399	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	563	304	50	414	159	434	1035	16	241	1052	111
RTOR Reduction (vph)	0	72	0	0	40	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	795	0	50	533	0	434	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.6	28.2		5.9	18.5		14.0	37.6		15.3	38.9	
Effective Green, g (s)	14.6	27.2		4.9	17.5		13.0	37.6		14.3	38.9	
Actuated g/C Ratio	0.15	0.27		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	258	897		87	589		446	1327		253	1349	
v/s Ratio Prot	c0.13	c0.24		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.86	0.89		0.57	0.90		0.97	0.79		0.95	0.86	
Uniform Delay, d1	41.7	34.9		46.5	40.4		43.3	27.7		42.5	28.0	
Progression Factor	0.63	0.79		1.04	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.4	8.3		5.4	16.4		35.3	4.9		43.1	7.2	
Delay (s)	45.8	35.9		53.7	53.8		78.6	32.6		85.6	35.1	
Level of Service	D	D		D	D		E	C		F	D	
Approach Delay (s)		38.0			53.8			46.0			43.8	
Approach LOS		D			D			D			D	

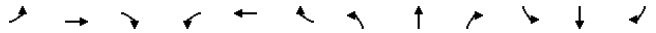
Intersection Summary			
HCM Average Control Delay	44.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.97			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3437			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3437			3156			2746	
Volume (vph)	16	638	16	9	443	89	19	212	23	75	166	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	693	17	10	482	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	24	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	707	0	10	555	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1966			549			478	
v/s Ratio Prot	c0.01	c0.20		0.01	0.16							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.35		0.48	0.28			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.21		1.00	1.00			1.00			1.00	
Incremental Delay, d2	21.9	0.2		6.1	0.4			0.6			1.9	
Delay (s)	46.5	7.1		30.6	5.8			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.0			6.2			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Exist PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	262	75	11	86	78	46	19	83	50	65	59	176
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	285	82	12	93	85	50	21	90	54	71	64	191

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	285	93	228	165	326
Volume Left (vph)	285	0	93	21	71
Volume Right (vph)	0	12	50	54	191
Hadj (s)	0.53	-0.06	-0.02	-0.14	-0.27
Departure Headway (s)	7.0	6.4	6.3	6.3	5.8
Degree Utilization, x	0.55	0.17	0.40	0.29	0.53
Capacity (veh/h)	491	532	512	496	574
Control Delay (s)	17.1	9.5	13.5	11.9	15.2
Approach Delay (s)	15.2		13.5	11.9	15.2
Approach LOS	C		B	B	C

Intersection Summary				
Delay	14.4			
HCM Level of Service	B			
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	

Intersection Summary					
HCM Average Control Delay	11.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	46.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3509			3500	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3509			3500	
Volume (vph)	73	162	14	96	123	36	0	1102	66	0	1204	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1198	72	0	1309	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1267	0	0	1408	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2160	
v/s Ratio Prot					c0.08			0.36			c0.40	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.58			0.65	
Uniform Delay, d1		42.7			43.5			12.0			12.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.5	
Delay (s)		46.7			45.4			13.2			14.4	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.2			14.4	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3184			5073	
Volume (vph)	0	0	0	64	237	549	19	807	0	0	1191	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	877	0	0	1295	22
RTOR Reduction (vph)	0	0	0	0	0	116	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	481	0	898	0	0	1315	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1946			3100	
v/s Ratio Prot					0.09						0.26	
v/s Ratio Perm						c0.30		c0.28				
v/c Ratio					0.31	1.01		0.46			0.42	
Uniform Delay, d1					24.3	31.5		9.5			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	44.4		0.8			0.4	
Delay (s)					24.4	75.9		10.3			9.6	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			57.6			10.3			9.6	
Approach LOS		A			E			B			A	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Exist PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3490		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3490		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	774	78	592	699	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	841	85	643	760	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	920	0	643	760	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	78.2	
Effective Green, g (s)		23.8						49.1		25.1	78.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1558		783	2516	
v/s Ratio Prot		c0.18						c0.26		c0.19	0.21	
v/s Ratio Perm												
v/c Ratio		0.82						0.59		0.82	0.30	
Uniform Delay, d1		41.1						22.9		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.7		6.6	0.0	
Delay (s)		48.0						24.5		46.9	5.9	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.5			24.7	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Saturday
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	113	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	123	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	325	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			208	201	13	325	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	88	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	531	658	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	126	12
Volume Left	0	87	0	1
Volume Right	0	1	123	3
cSH	1604	1605	1050	717
Volume to Capacity	0.00	0.05	0.12	0.02
Queue Length 95th (ft)	0	4	10	1
Control Delay (s)	0.0	6.4	8.9	10.1
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	8.9	10.1
Approach LOS			A	B

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	59	35	13	92	42	20	13	328	199	17	197	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	38	14	100	46	22	14	357	216	18	214	42

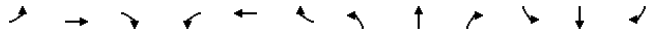
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	64	52	100	67	587	18	257
Volume Left (vph)	64	0	100	0	14	18	0
Volume Right (vph)	0	14	0	22	216	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.18	0.53	-0.08
Departure Headway (s)	7.9	7.2	7.8	7.0	5.7	6.9	6.2
Degree Utilization, x	0.14	0.10	0.22	0.13	0.94	0.04	0.45
Capacity (veh/h)	435	475	444	489	617	507	560
Control Delay (s)	11.0	9.9	11.7	9.9	45.5	8.9	13.0
Approach Delay (s)	10.5		11.0		45.5	12.7	
Approach LOS	B		B		E	B	

Intersection Summary				
Delay	29.0			
HCM Level of Service	D			
Intersection Capacity Utilization	58.9%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	251	0	0	154	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	273	0	0	167	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			273		440	273
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			273		440	273
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1290		574	766

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	273	167	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1290	1700
Volume to Capacity	0.16	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	16.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	97	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	105	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	180	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	-0.49	0.00	-0.19	0.04
Departure Headway (s)	4.0	4.4	4.0	4.3
Degree Utilization, x	0.02	0.08	0.20	0.08
Capacity (veh/h)	836	757	881	801
Control Delay (s)	7.1	7.8	7.9	7.7
Approach Delay (s)	7.1	7.8	7.9	7.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.8	
HCM Level of Service			A	
Intersection Capacity Utilization		27.9%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	33	21	9	550	285	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	23	10	598	310	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	941	323	337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	941	323	337			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	97	99			
cM capacity (veh/h)	290	718	1222			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	59	10	598	337
Volume Left	36	10	0	0
Volume Right	23	0	0	27
cSH	377	1222	1700	1700
Volume to Capacity	0.16	0.01	0.35	0.20
Queue Length 95th (ft)	14	1	0	0
Control Delay (s)	16.3	8.0	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.3	0.1		0.0
Approach LOS	C			

Intersection Summary				
Average Delay			1.0	
Intersection Capacity Utilization		38.9%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3383		3539	1492		3521
Flt Permitted	0.96		1.00	1.00		0.91
Satd. Flow (perm)	3383		3539	1492		3221
Volume (vph)	749	76	302	261	26	325
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	814	83	328	284	28	353
RTOR Reduction (vph)	7	0	0	165	0	0
Lane Group Flow (vph)	890	0	328	119	0	381
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.51		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1722		1480	624		1347
v/s Ratio Prot	c0.26		0.09			
v/s Ratio Perm				0.08		c0.12
v/c Ratio	0.52		0.22	0.19		0.28
Uniform Delay, d1	18.0		20.5	20.2		21.1
Progression Factor	0.44		0.64	2.08		1.00
Incremental Delay, d2	1.0		0.3	0.5		0.5
Delay (s)	8.9		13.4	42.6		21.6
Level of Service	A		B	D		C
Approach Delay (s)	8.9		27.0			21.6
Approach LOS	A		C			C

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	220	51	660	781	214	181
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	55	717	849	233	197
RTOR Reduction (vph)	0	27	0	0	0	25
Lane Group Flow (vph)	239	28	717	849	233	172
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	20.4	57.4	33.5	82.6	45.6	69.5
Effective Green, g (s)	19.9	56.9	33.0	82.1	45.1	69.0
Actuated g/C Ratio	0.18	0.52	0.30	0.75	0.41	0.63
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	320	819	1030	1390	764	993
v/s Ratio Prot	c0.14	0.02	c0.21	c0.46	0.13	0.11
v/s Ratio Perm						
v/c Ratio	0.75	0.03	0.70	0.61	0.30	0.17
Uniform Delay, d1	42.7	13.1	34.1	6.5	21.9	8.6
Progression Factor	0.37	0.02	0.37	1.20	1.00	1.00
Incremental Delay, d2	8.7	0.0	1.4	1.3	1.0	0.1
Delay (s)	24.4	0.2	14.0	9.1	22.9	8.7
Level of Service	C	A	B	A	C	A
Approach Delay (s)	19.8			11.3	16.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1680		1770	3539	1583	1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1680		1770	3539	1583	1770	1833	
Volume (vph)	26	21	7	662	13	16	41	244	777	120	390	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	720	14	17	45	265	845	130	424	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	381	369	0	45	265	845	130	455	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	20.2	20.2		3.5	17.3	63.6	7.5	21.3	
Effective Green, g (s)	2.6	2.6	2.6	20.2	20.2		3.0	17.8	63.6	7.0	21.8	
Actuated g/C Ratio	0.04	0.04	0.04	0.32	0.32		0.05	0.28	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	65	534	534		83	990	1583	195	628	
v/s Ratio Prot	0.02	0.01		c0.23	0.22		0.03	0.07		0.07	c0.25	
v/s Ratio Perm			0.00						c0.53			
v/c Ratio	0.39	0.30	0.01	0.71	0.69		0.54	0.27	0.53	0.67	0.73	
Uniform Delay, d1	29.7	29.6	29.3	19.1	19.0		29.6	17.8	0.0	27.2	18.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.2	3.5		3.8	0.1	1.3	6.5	3.9	
Delay (s)	31.0	30.4	29.3	23.3	22.5		33.5	17.9	1.3	33.7	22.2	
Level of Service	C	C	C	C	C		C	B	A	C	C	
Approach Delay (s)		30.5			22.9			6.4			24.7	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	63.6	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.97	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.95	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3132	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3132	1399				3433		1583
Volume (vph)	113	273	0	0	353	961	0	0	0	829	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1045	0	0	0	901	0	263
RTOR Reduction (vph)	0	0	0	0	35	0	0	0	0	0	0	184
Lane Group Flow (vph)	123	297	0	0	541	853	0	0	0	901	0	79
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	69.1			53.8	110.0				32.4		32.4
Effective Green, g (s)	11.3	69.1			53.8	110.0				32.9		32.9
Actuated g/C Ratio	0.10	0.63			0.49	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2223			1532	1399				1027		473
v/s Ratio Prot	0.07	0.08			0.17							0.05
v/s Ratio Perm						c0.61				c0.26		
v/c Ratio	0.68	0.13			0.35	0.61				0.88		0.17
Uniform Delay, d1	47.6	8.3			17.4	0.0				36.6		28.4
Progression Factor	1.00	1.00			0.75	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.1			0.5	1.6				8.5		0.1
Delay (s)	55.2	8.4			13.5	1.6				45.2		28.6
Level of Service	E	A			B	A				D		C
Approach Delay (s)		22.1			6.4			0.0			41.4	
Approach LOS		C			A			A			D	

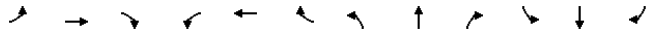
Intersection Summary				
HCM Average Control Delay	22.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1451	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1451	659			
Volume (vph)	111	991	0	0	942	410	372	21	980	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1077	0	0	1024	446	404	23	1065	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	284	0	166	6	0	0	0
Lane Group Flow (vph)	121	1077	0	0	1024	162	404	389	527	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.6	37.0			39.9	39.9	48.0	48.0	65.0			
Effective Green, g (s)	10.1	37.0			39.9	39.9	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	163	1197			1682	529	734	633	389			
v/s Ratio Prot	0.07	c0.30			c0.22		0.24	0.27	c0.80			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	0.90			0.61	0.31	0.55	0.61	1.36			
Uniform Delay, d1	48.7	34.7			28.7	25.1	23.0	23.9	22.5			
Progression Factor	1.15	0.62			1.01	2.36	1.00	1.00	1.00			
Incremental Delay, d2	13.4	10.0			1.4	1.2	3.0	4.4	176.0			
Delay (s)	69.5	31.5			30.4	60.6	26.0	28.3	198.5			
Level of Service	E	C			C	E	C	C	F			
Approach Delay (s)		35.3			39.6			88.5			0.0	
Approach LOS		D			D			F			A	

Intersection Summary			
HCM Average Control Delay	55.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

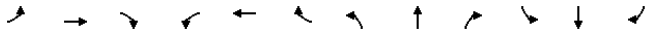
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1834	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1834	2628
Volume (vph)	380	450	1141	270	442	126	227	62	101	124	270	671
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	413	489	1240	293	480	137	247	67	110	135	293	729
RTOR Reduction (vph)	0	209	95	0	0	57	0	0	98	0	0	78
Lane Group Flow (vph)	413	900	525	293	480	80	153	161	12	0	428	651
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		500	1266
v/s Ratio Prot	0.12	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.23	0.25
v/s Ratio Perm						0.05			0.01			
v/c Ratio	0.70	0.94	1.01	1.07	0.45	0.18	0.84	0.86	0.07		0.86	0.51
Uniform Delay, d1	42.8	36.4	31.5	46.5	31.2	28.4	48.0	48.2	44.0		38.0	19.6
Progression Factor	1.16	0.76	0.67	1.00	1.00	1.00	1.26	1.26	2.47		0.60	0.91
Incremental Delay, d2	2.1	6.8	23.5	74.0	1.4	0.8	23.7	26.6	0.1		15.7	1.4
Delay (s)	51.7	34.3	44.6	120.5	32.6	29.3	84.3	87.3	108.7		38.4	19.2
Level of Service	D	C	D	F	C	C	F	F	F		D	B
Approach Delay (s)		40.6			60.4			91.8			26.3	
Approach LOS		D			E			F			C	

Intersection Summary			
HCM Average Control Delay	45.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3530			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3530			1863	
Volume (vph)	105	218	1025	51	0	120	0	1216	21	0	267	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1322	23	0	290	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1344	0	0	290	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	8.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.38			0.16	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.82			0.44	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		25.5			27.4	
Progression Factor	1.19	1.19	1.56	1.00		1.00		0.69			1.08	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		4.0			2.1	
Delay (s)	29.7	29.4	40.4	50.9		48.1		21.7			31.8	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.8			48.9			21.7			31.8	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	31.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	75.0%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3386		1770	3501		1770	1821		1770	1863	1543
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3386		1770	3501		1770	1821		1770	1863	1543
Volume (vph)	66	435	158	37	564	35	168	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	473	172	40	613	38	183	163	24	38	190	97
RTOR Reduction (vph)	0	41	0	0	6	0	0	8	0	0	0	82
Lane Group Flow (vph)	72	604	0	40	645	0	183	179	0	38	190	15
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	3.1	25.8		1.4	24.1		9.4	9.4		9.4	9.4	9.4
Effective Green, g (s)	3.1	25.8		1.4	24.1		9.4	9.4		9.4	9.4	9.4
Actuated g/C Ratio	0.05	0.42		0.02	0.39		0.15	0.15		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	89	1409		40	1361		268	276		268	282	234
v/s Ratio Prot	c0.04	0.18		0.02	c0.18		c0.10	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.81	0.43		1.00	0.47		0.68	0.65		0.14	0.67	0.06
Uniform Delay, d1	29.2	12.9		30.3	14.2		24.9	24.7		22.8	24.9	22.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.8	0.2		142.3	0.3		7.0	5.1		0.2	6.2	0.1
Delay (s)	69.0	13.1		172.6	14.5		31.9	29.9		23.0	31.1	22.6
Level of Service	E	B		F	B		C	C		C	C	C
Approach Delay (s)		18.7			23.6			30.9			27.6	
Approach LOS		B			C			C			C	

Intersection Summary					
HCM Average Control Delay	23.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	62.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	53.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Saturday
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3460		1770	3514			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3460		1770	3514			1801	1555		1772	
Volume (vph)	18	819	96	152	902	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	890	104	165	980	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	987	0	165	1011	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1557		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.29		c0.09	0.29			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.63		0.84	0.52			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.2		43.6	14.2			40.0	36.2		39.7	
Progression Factor	1.06	0.40		0.83	0.66			1.00	1.00		1.00	
Incremental Delay, d2	209.6	1.7		18.3	0.7			7.7	0.2		0.4	
Delay (s)	262.2	10.2		54.4	10.0			47.7	36.3		40.0	
Level of Service	F	B		D	A			D	D		D	
Approach Delay (s)		15.2			16.2			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Saturday
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3082		1770	3387		3433	3501		1770	3282	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3082		1770	3387		3433	3501		1770	3282	
Volume (vph)	166	513	310	69	407	65	449	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	558	337	75	442	71	488	701	27	123	743	200
RTOR Reduction (vph)	0	88	0	0	13	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	807	0	75	500	0	488	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.7		5.2	24.8		16.1	35.3		10.8	30.0	
Effective Green, g (s)	12.6	32.7		4.7	24.8		15.6	36.3		10.3	31.0	
Actuated g/C Ratio	0.13	0.33		0.05	0.25		0.16	0.36		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	1008		83	840		536	1271		182	1017	
v/s Ratio Prot	c0.10	c0.26		0.04	0.15		c0.14	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.80		0.90	0.60		0.91	0.57		0.68	0.90	
Uniform Delay, d1	42.5	30.7		47.4	33.2		41.5	25.6		43.2	33.1	
Progression Factor	1.14	0.38		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.4	5.7		66.1	3.1		19.3	1.9		7.6	12.8	
Delay (s)	64.0	17.2		113.5	36.3		60.8	27.5		50.8	45.9	
Level of Service	E	B		F	D		E	C		D	D	
Approach Delay (s)		25.1			46.1			40.9			46.4	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	38.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
NO PROJECT ALTERNATIVE
2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3393		1770	3518		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3393		1770	3518		1770	3421		1770	1863	1583
Volume (vph)	514	847	322	104	742	30	114	219	63	61	207	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	339	109	781	32	120	231	66	64	218	208
RTOR Reduction (vph)	0	32	0	0	2	0	0	25	0	0	0	177
Lane Group Flow (vph)	541	1199	0	109	811	0	120	272	0	64	218	31
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	52.8		10.6	28.8		13.1	13.1		16.5	16.5	16.5
Effective Green, g (s)	34.6	53.8		10.6	29.8		13.1	13.1		16.5	16.5	16.5
Actuated g/C Ratio	0.31	0.49		0.10	0.27		0.12	0.12		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1659		171	953		211	407		266	279	237
v/s Ratio Prot	c0.31	0.35		0.06	c0.23		0.07	c0.08		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.72		0.64	0.85		0.57	0.67		0.24	0.78	0.13
Uniform Delay, d1	37.2	22.2		47.8	38.0		45.8	46.4		41.2	45.0	40.5
Progression Factor	1.00	1.00		0.90	1.31		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	2.8		5.7	7.2		2.8	3.7		0.5	13.2	0.3
Delay (s)	68.0	25.0		49.0	57.0		48.6	50.1		41.7	58.3	40.8
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.1			56.1			49.7			48.7	
Approach LOS		D			E			D			D	

Intersection Summary					
HCM Average Control Delay	45.5	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	80.5%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3438		1770	3491		1770	3447	
Flt Permitted	0.21	1.00			0.72		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	393	3453			2495		1770	3491		1770	3447	
Volume (vph)	122	709	137	42	551	123	194	640	64	118	733	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	44	580	129	204	674	67	124	772	162
RTOR Reduction (vph)	0	17	0	0	18	0	0	6	0	0	14	0
Lane Group Flow (vph)	128	873	0	0	735	0	204	735	0	124	920	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	38.3	38.3			38.3		15.2	42.7		16.0	43.5	
Effective Green, g (s)	38.3	38.3			38.3		15.2	43.7		16.0	44.5	
Actuated g/C Ratio	0.35	0.35			0.35		0.14	0.40		0.15	0.40	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	137	1202			869		245	1387		257	1394	
v/s Ratio Prot		0.25					c0.12	0.21		0.07	c0.27	
v/s Ratio Perm	c0.33				0.29							
v/c Ratio	0.93	0.73			0.85		0.83	0.53		0.48	0.66	
Uniform Delay, d1	34.6	31.3			33.1		46.2	25.3		43.2	26.6	
Progression Factor	0.47	0.52			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	46.4	1.6			7.6		20.8	1.5		1.4	2.5	
Delay (s)	62.8	17.9			40.7		67.0	26.8		44.6	29.1	
Level of Service	E	B			D		E	C		D	C	
Approach Delay (s)		23.6			40.7			35.4			30.9	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	32.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	70	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	74	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	298	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	298	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	93	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	586	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	76	1
Volume Left	0	81	2	0
Volume Right	2	1	74	0
cSH	1545	1616	1063	640
Volume to Capacity	0.00	0.05	0.07	0.00
Queue Length 95th (ft)	0	4	6	0
Control Delay (s)	0.0	4.4	8.6	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.6	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 No Project AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	35	61	5	56	47	112	11	146	42	119	134	90	215	8	25	157	59	10

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	101	215	199	343	223	182	69
Delay	31.3	0.3	18.6	19.7	0.2	34.5	31.6
LOS	C	A	B	B	A	C	C

HCM Average Control Delay	**24.7**
HCM Level of Service	**C**

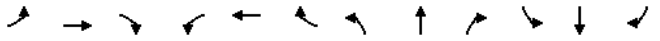
NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

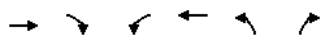
HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.89			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1856	1583	1770	1750	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1665			1816	1583	1770	1750	
Volume (vph)	35	61	5	56	47	112	11	146	42	119	134	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	64	5	59	49	118	12	154	44	125	141	95
RTOR Reduction (vph)	0	3	0	0	78	0	0	0	31	0	17	0
Lane Group Flow (vph)	37	66	0	59	89	0	0	166	13	125	219	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	6.1	6.1		19.2	19.2			21.4	21.4	7.7	33.1	
Effective Green, g (s)	6.1	6.1		19.2	19.2			21.4	21.4	7.7	33.1	
Actuated g/C Ratio	0.09	0.09		0.27	0.27			0.30	0.30	0.11	0.47	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	153	160		483	454			552	481	194	823	
v/s Ratio Prot	0.02	c0.04		0.03	c0.05					c0.07	0.13	
v/s Ratio Perm								c0.09	0.01			
v/c Ratio	0.24	0.41		0.12	0.20			0.30	0.03	0.64	0.27	
Uniform Delay, d1	30.0	30.5		19.3	19.7			18.8	17.2	30.0	11.3	
Progression Factor	1.00	1.00		0.05	0.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.3		0.0	0.1			0.2	0.0	5.4	0.1	
Delay (s)	30.6	31.7		1.1	0.1			19.0	17.2	35.4	11.4	
Level of Service	C	C		A	A			B	B	D	B	
Approach Delay (s)		31.3			0.3			18.6			19.7	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1854		1770	1863	1751	
Flt Permitted	1.00		0.43	1.00	0.96	
Satd. Flow (perm)	1854		801	1863	1751	
Volume (vph)	215	8	25	157	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	226	8	26	165	62	11
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	233	0	26	165	68	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	56.5		9.3	9.3	5.9	
Effective Green, g (s)	56.5		9.3	9.3	5.9	
Actuated g/C Ratio	0.80		0.13	0.13	0.08	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1488		106	246	147	
v/s Ratio Prot	c0.13			c0.09	c0.04	
v/s Ratio Perm			0.03			
v/c Ratio	0.16		0.25	0.67	0.46	
Uniform Delay, d1	1.6		27.4	29.1	30.7	
Progression Factor	0.12		1.00	1.00	1.00	
Incremental Delay, d2	0.0		0.9	6.4	0.8	
Delay (s)	0.2		28.3	35.5	31.6	
Level of Service	A		C	D	C	
Approach Delay (s)	0.2			34.5	31.6	
Approach LOS	A			C	C	

Intersection Summary				
HCM Average Control Delay	18.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	29.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1713			1820		1770	1850		1770	1828	
Flt Permitted		0.92			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1586			1469		1770	1850		1770	1828	
Volume (vph)	53	67	132	37	61	4	36	293	14	23	443	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	71	139	39	64	4	38	308	15	24	466	66
RTOR Reduction (vph)	0	79	0	0	2	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	187	0	0	105	0	38	320	0	24	524	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		317			294		85	1003		32	936	
v/s Ratio Prot							c0.02	0.17		0.01	c0.29	
v/s Ratio Perm		c0.12			0.07							
v/c Ratio		0.59			0.36		0.45	0.32		0.75	0.56	
Uniform Delay, d1		18.1			17.2		23.2	6.3		24.4	8.3	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		2.3			0.5		2.7	0.8		62.8	2.4	
Delay (s)		20.5			17.8		23.0	8.2		87.2	10.8	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		20.5			17.8			9.7			14.1	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	14.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	53.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	69	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	73	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	162	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.18	0.00
Departure Headway (s)	4.2	4.6	4.0	4.3
Degree Utilization, x	0.01	0.09	0.18	0.10
Capacity (veh/h)	793	733	872	812
Control Delay (s)	7.3	8.1	7.9	7.7
Approach Delay (s)	7.3	8.1	7.9	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	43	17	16	173	186	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	45	18	17	182	196	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	417	202	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	417	202	207			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	98	99			
cM capacity (veh/h)	585	839	1364			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	63	17	182	207
Volume Left	45	17	0	0
Volume Right	18	0	0	12
cSH	640	1364	1700	1700
Volume to Capacity	0.10	0.01	0.11	0.12
Queue Length 95th (ft)	8	1	0	0
Control Delay (s)	11.2	7.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.2	0.6		0.0
Approach LOS	B			

Intersection Summary				
Average Delay			1.8	
Intersection Capacity Utilization			23.4%	ICU Level of Service A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1655		1770	3539	1583		3515	
Flt Permitted		0.97	1.00	0.95	0.96		0.55	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1655		1033	3539	1583		3291	
Volume (vph)	39	28	117	290	4	29	59	245	98	17	284	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	305	4	31	62	258	103	18	299	9
RTOR Reduction (vph)	0	0	116	0	9	0	0	0	33	0	2	0
Lane Group Flow (vph)	0	70	7	175	156	0	62	258	70	0	324	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	14.2	14.2		68.4	68.4	68.4		68.4	
Effective Green, g (s)		5.9	5.9	14.2	14.2		67.9	67.9	67.9		67.9	
Actuated g/C Ratio		0.06	0.06	0.14	0.14		0.68	0.68	0.68		0.68	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	239	235		701	2403	1075		2235	
v/s Ratio Prot		c0.04		c0.10	0.09			0.07				
v/s Ratio Perm			0.00				0.06		0.04		c0.10	
v/c Ratio		0.65	0.08	0.73	0.67		0.09	0.11	0.07		0.14	
Uniform Delay, d1		46.1	44.5	41.1	40.7		5.5	5.6	5.4		5.7	
Progression Factor		1.00	1.00	1.65	1.70		0.04	0.04	0.00		1.00	
Incremental Delay, d2		12.1	0.3	10.8	6.8		0.2	0.1	0.1		0.1	
Delay (s)		58.2	44.7	78.7	75.9		0.4	0.3	0.1		5.9	
Level of Service		E	D	E	E		A	A	A		A	
Approach Delay (s)		49.6			77.3			0.3			5.9	
Approach LOS		D			E			A			A	

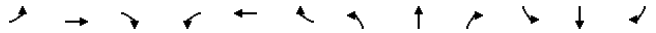
Intersection Summary				
HCM Average Control Delay		29.6	HCM Level of Service	C
HCM Volume to Capacity ratio		0.27		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		41.1%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	55	43	253	212	69	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	45	266	223	73	124
RTOR Reduction (vph)	0	33	0	0	0	114
Lane Group Flow (vph)	58	12	266	223	73	10
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	8.2	26.2	14.5	84.8	66.8	8.2
Effective Green, g (s)	7.7	25.7	14.0	84.3	66.3	7.7
Actuated g/C Ratio	0.08	0.26	0.14	0.84	0.66	0.08
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	136	407	481	1571	1235	122
v/s Ratio Prot	c0.03	0.01	c0.08	c0.12	0.04	0.01
v/s Ratio Perm						
v/c Ratio	0.43	0.03	0.55	0.14	0.06	0.08
Uniform Delay, d1	44.0	27.8	40.1	1.4	5.9	42.9
Progression Factor	0.83	2.73	1.10	0.11	1.00	1.00
Incremental Delay, d2	2.1	0.0	1.4	0.2	0.1	0.3
Delay (s)	38.8	75.9	45.4	0.3	6.0	43.1
Level of Service	D	E	D	A	A	D
Approach Delay (s)	55.0			24.9	29.4	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1798	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1798	
Volume (vph)	5	21	16	648	79	0	88	84	759	76	235	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	682	83	0	93	88	799	80	247	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	372	393	0	93	88	799	80	311	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.7	2.7	2.7	20.7	20.7		4.5	15.9	59.0	4.2	15.6	
Effective Green, g (s)	2.2	2.2	2.2	20.7	20.7		4.0	16.4	59.0	3.7	16.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.35	0.35		0.07	0.28	1.00	0.06	0.27	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	590	597		120	984	1583	111	491	
v/s Ratio Prot	0.00	0.01		0.22	c0.23		0.05	0.02		0.05	c0.17	
v/s Ratio Perm			0.00						c0.50			
v/c Ratio	0.08	0.32	0.01	0.63	0.66		0.78	0.09	0.50	0.72	0.63	
Uniform Delay, d1	27.4	27.7	27.4	16.0	16.2		27.1	15.8	0.0	27.1	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.9	2.3		24.2	0.0	1.2	17.6	2.3	
Delay (s)	27.6	28.6	27.4	17.9	18.5		51.2	15.8	1.2	44.8	21.2	
Level of Service	C	C	C	B	B		D	B	A	D	C	
Approach Delay (s)		28.0			18.2			7.2			25.9	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3390	1441				3433		1583
Volume (vph)	119	216	190	0	691	922	0	0	0	755	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	971	0	0	0	795	0	136
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	99
Lane Group Flow (vph)	125	357	0	0	727	971	0	0	0	795	0	37
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	64.8			41.8	100.0				26.7		26.7
Effective Green, g (s)	19.0	64.8			41.8	100.0				27.2		27.2
Actuated g/C Ratio	0.19	0.65			0.42	1.00				0.27		0.27
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2133			1417	1441				934		431
v/s Ratio Prot	0.07	0.11			0.21					c0.23		
v/s Ratio Perm						c0.67						0.02
v/c Ratio	0.37	0.17			0.51	0.67				0.85		0.09
Uniform Delay, d1	35.3	6.9			21.6	0.0				34.5		27.1
Progression Factor	1.00	1.00			0.75	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.6				7.4		0.1
Delay (s)	35.6	7.1			17.0	1.6				41.9		27.2
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.6			8.2			0.0			39.8	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1468	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1468	1504			
Volume (vph)	74	897	0	0	1002	344	611	2	1125	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	944	0	0	1055	362	643	2	1184	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	246	0	87	41	0	0	0
Lane Group Flow (vph)	78	944	0	0	1055	116	547	560	594	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	558	677			
v/s Ratio Prot	0.04	c0.19			c0.23		0.33	c0.38	c0.39			
v/s Ratio Perm						0.07						
v/c Ratio	0.24	0.39			0.71	0.23	0.86	1.00	0.88			
Uniform Delay, d1	35.2	17.2			29.9	24.9	28.5	31.0	25.0			
Progression Factor	0.60	0.51			0.45	0.24	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.4			2.3	0.8	11.1	38.8	12.6			
Delay (s)	22.7	9.2			15.8	6.9	39.6	69.8	37.5			
Level of Service	C	A			B	A	D	E	D			
Approach Delay (s)		10.2			13.5			49.6			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1794	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1794	2628
Volume (vph)	346	1306	370	75	743	66	42	3	42	144	45	567
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	364	1375	389	79	782	69	44	3	44	152	47	597
RTOR Reduction (vph)	0	0	188	0	0	13	0	0	41	0	0	194
Lane Group Flow (vph)	364	1375	201	79	782	56	23	24	3	0	199	403
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.2	40.9	52.2	6.8	26.5	26.5	7.8	7.8	7.8		30.5	50.7
Effective Green, g (s)	19.7	40.4	51.7	6.3	27.0	27.0	7.3	7.3	7.3		30.0	49.7
Actuated g/C Ratio	0.20	0.40	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	676	1370	745	112	956	427	123	124	116		538	1306
v/s Ratio Prot	0.11	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.11	0.15
v/s Ratio Perm						0.04			0.00			
v/c Ratio	0.54	1.00	0.27	0.71	0.82	0.13	0.19	0.19	0.03		0.37	0.31
Uniform Delay, d1	36.1	29.8	13.6	45.9	34.2	27.6	43.6	43.6	43.1		27.6	14.9
Progression Factor	1.15	0.56	0.40	1.00	1.00	1.00	1.00	1.00	1.00		1.15	0.92
Incremental Delay, d2	2.2	21.3	0.1	15.2	7.7	0.6	0.5	0.6	0.1		1.8	0.6
Delay (s)	43.5	37.9	5.5	61.1	41.9	28.3	44.1	44.1	43.1		33.5	14.4
Level of Service	D	D	A	E	D	C	D	D	D		C	B
Approach Delay (s)		33.0			42.5			43.6			19.1	
Approach LOS		C			D			D			B	

Intersection Summary				
HCM Average Control Delay	32.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	257	0	0	0	0	470	9	0	117	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	495	9	0	123	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	503	0	0	123	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.6					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.14			0.07	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.22			0.12	
Uniform Delay, d1	26.8	26.8	21.2					7.3			10.4	
Progression Factor	0.95	0.95	0.76					1.00			0.94	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.2	
Delay (s)	25.6	25.5	16.1					7.6			10.0	
Level of Service	C	C	B					A			B	
Approach Delay (s)		18.5			0.0			7.6			10.0	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	23.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3345		1770	3479		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3345		1770	3479		1770	1832		1770	1863	1583
Volume (vph)	393	436	251	36	471	61	233	210	26	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	459	264	38	496	64	245	221	27	29	212	108
RTOR Reduction (vph)	0	64	0	0	10	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	659	0	38	550	0	245	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	28.4	45.2		5.7	22.5		18.1	18.1		16.0	16.0	16.0
Effective Green, g (s)	27.9	45.7		5.2	23.0		17.6	17.6		15.5	15.5	15.5
Actuated g/C Ratio	0.28	0.46		0.05	0.23		0.18	0.18		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	494	1529		92	800		312	322		274	289	245
v/s Ratio Prot	c0.23	0.20		0.02	c0.16		c0.14	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.84	0.43		0.41	0.69		0.79	0.75		0.11	0.73	0.07
Uniform Delay, d1	33.9	18.4		45.9	35.2		39.4	39.1		36.3	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.97	0.97		0.81	0.85	1.27
Incremental Delay, d2	11.8	0.9		3.0	4.8		12.2	9.6		0.2	9.0	0.1
Delay (s)	45.7	19.2		48.9	40.0		50.5	47.7		29.6	43.3	45.8
Level of Service	D	B		D	D		D	D		C	D	D
Approach Delay (s)		28.9			40.6			49.1			42.9	
Approach LOS		C			D			D			D	

Intersection Summary						
HCM Average Control Delay	37.4	HCM Level of Service		D		
HCM Volume to Capacity ratio	0.77					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0		
Intersection Capacity Utilization	73.6%	ICU Level of Service		D		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3368		1770	3513		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3368		1770	3513		1770	3487		1770	3497	
Volume (vph)	94	254	121	100	413	22	127	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	267	127	105	435	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	62	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	332	0	105	454	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	17.4		9.3	18.8		12.6	51.1		7.2	45.7	
Effective Green, g (s)	6.9	17.9		8.3	19.3		11.6	51.6		6.2	46.2	
Actuated g/C Ratio	0.07	0.18		0.08	0.19		0.12	0.52		0.06	0.46	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	603		147	678		205	1799		110	1616	
v/s Ratio Prot	0.06	0.10		c0.06	c0.13		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.55		0.71	0.67		0.65	0.35		0.47	0.54	
Uniform Delay, d1	45.9	37.4		44.7	37.4		42.3	14.3		45.3	19.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.0		15.2	2.5		7.3	0.5		3.2	1.3	
Delay (s)	78.0	38.4		59.9	39.9		49.6	14.8		48.5	20.5	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		46.4			43.6			20.9			22.1	
Approach LOS		D			D			C			C	

Intersection Summary						
HCM Average Control Delay	30.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.58					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	60.9%	ICU Level of Service		B		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3438		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3438		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	271	64	43	346	177	59	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	285	67	45	364	186	62	165	32	26	53	9
RTOR Reduction (vph)	0	13	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	339	0	45	364	101	62	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		5.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1788		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	0.10		c0.03	c0.10		0.04	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.19		0.53	0.19	0.12	0.25	0.73			0.35	
Uniform Delay, d1	48.1	12.8		46.5	11.7	11.2	38.1	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.0	0.2		4.5	0.2	0.3	0.4	9.6			0.7	
Delay (s)	58.1	13.0		51.0	11.9	11.5	38.5	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		16.0			14.7			47.8			40.3	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	23.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3441		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3441		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	59	52	527	167	130	253	39	108	182	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	62	55	555	176	137	266	41	114	192	11
RTOR Reduction (vph)	0	15	0	0	0	89	0	0	32	0	2	0
Lane Group Flow (vph)	29	319	0	55	555	87	137	266	9	114	201	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.8		7.0	49.3	49.3	12.0	23.3	23.3	8.4	19.7	
Effective Green, g (s)	4.0	46.8		6.5	49.3	49.3	11.5	22.8	22.8	7.9	19.2	
Actuated g/C Ratio	0.04	0.47		0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1610		115	1745	780	204	425	361	140	355	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		0.08	c0.14		c0.06	0.11	
v/s Ratio Perm						0.05			0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.11	0.67	0.63	0.03	0.81	0.57	
Uniform Delay, d1	46.8	15.6		45.1	15.2	13.6	42.4	34.8	30.0	45.3	36.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.03	0.84	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.3	7.7	2.5	0.0	28.0	1.6	
Delay (s)	49.6	15.9		47.4	15.7	13.9	50.1	37.2	30.0	74.7	32.3	
Level of Service	D	B		D	B	B	D	D	C	E	C	
Approach Delay (s)		18.6			17.5			40.5			47.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	28.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1020: 40th St & Harlan St — 2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	363	16	90	726	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	382	17	95	764	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	786			399			1015	1417	199	1291	1414	393
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	786			399			1015	1417	199	1291	1414	393
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			84	89	90	98	97	100
cM capacity (veh/h)	828			1156			172	121	808	91	121	606

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	255	144	95	509	277	34	85	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	828	1700	1700	1156	1700	1700	159	554	124
Volume to Capacity	0.03	0.15	0.08	0.08	0.30	0.16	0.22	0.15	0.05
Queue Length 95th (ft)	2	0	0	7	0	0	20	13	4
Control Delay (s)	9.5	0.0	0.0	8.4	0.0	0.0	33.8	12.7	35.5
Lane LOS	A			A			D	B	E
Approach Delay (s)	0.6			0.9			18.7		35.5
Approach LOS							C		E

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	38.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1021: 40th St & Emery St — 2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3469		1770	3496			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3469		1770	3496			1805	1583		1545	
Volume (vph)	3	373	57	122	607	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	393	60	128	639	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	9	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	444	0	128	691	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1700		191	2077			310	272		108	
v/s Ratio Prot	0.00	c0.13		c0.07	c0.20			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.26		0.67	0.33			0.80	0.08		0.32	
Uniform Delay, d1	49.7	14.9		42.9	10.3			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.70			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.5	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.3		54.3	7.4			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.7			14.7			46.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3368		1770	3384		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3368		1770	3384		3433	3534		1770	3508	
Volume (vph)	92	278	132	32	434	179	288	785	8	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	293	139	34	457	188	303	826	8	168	917	57
RTOR Reduction (vph)	0	64	0	0	45	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	368	0	34	600	0	303	833	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	21.5		8.5	21.5		15.0	43.7		13.3	42.0	
Effective Green, g (s)	7.5	20.5		7.5	20.5		14.0	43.7		12.3	42.0	
Actuated g/C Ratio	0.08	0.20		0.08	0.20		0.14	0.44		0.12	0.42	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	690		133	694		481	1544		218	1473	
v/s Ratio Prot	c0.05	0.11		0.02	c0.18		0.09	c0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.53		0.26	0.86		0.63	0.54		0.77	0.66	
Uniform Delay, d1	45.3	35.5		43.6	38.4		40.6	20.7		42.5	23.3	
Progression Factor	1.30	1.04		1.13	1.10		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.3	0.6		0.4	10.1		1.9	1.4		14.2	2.3	
Delay (s)	74.0	37.4		49.8	52.3		42.4	22.1		56.6	25.6	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		44.1			52.2			27.5			30.1	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	35.7	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3501		1770	3495			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3501		1770	3495			3172			2914	
Volume (vph)	50	375	29	78	553	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	395	31	82	582	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	416	0	82	624	0	0	195	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.8	25.9		3.9	27.0			9.2			9.2	
Effective Green, g (s)	2.3	25.9		3.4	27.0			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	81	1814		120	1887			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.18							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.65	0.23		0.68	0.33			0.35			0.71	
Uniform Delay, d1	23.5	6.6		22.8	6.4			18.2			19.5	
Progression Factor	0.70	1.33		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.3	0.3		12.1	0.5			0.4			4.7	
Delay (s)	28.8	9.0		34.8	6.9			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		11.2			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	14.5	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	215	57	2	8	78	26	2	1	2	16	4	127
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	226	60	2	8	82	27	2	1	2	17	4	134

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	226	62	118	5	155
Volume Left (vph)	226	0	8	2	17
Volume Right (vph)	0	2	27	2	134
Hadj (s)	0.53	0.01	-0.09	-0.13	-0.46
Departure Headway (s)	5.5	5.0	4.7	5.0	4.4
Degree Utilization, x	0.35	0.09	0.15	0.01	0.19
Capacity (veh/h)	628	696	735	652	748
Control Delay (s)	10.2	7.3	8.5	8.0	8.5
Approach Delay (s)	9.6		8.5	8.0	8.5
Approach LOS	A		A	A	A

Intersection Summary				
Delay	9.0			
HCM Level of Service	A			
Intersection Capacity Utilization	34.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary					
HCM Average Control Delay	14.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	56.6	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	49.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3503			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3503			3490	
Volume (vph)	60	193	12	111	256	20	0	994	72	0	942	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1046	76	0	992	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	5	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1117	0	0	1087	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.32			0.31	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.54			0.52	
Uniform Delay, d1		43.9			42.1			12.7			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.0			1.0	
Delay (s)		52.4			46.5			13.7			13.5	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.7			13.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3260			5076	
Volume (vph)	0	0	0	65	461	718	12	499	0	0	986	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	525	0	0	1038	13
RTOR Reduction (vph)	0	0	0	0	0	203	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	553	0	538	0	0	1050	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					35.8	35.8		55.2			55.2	
Effective Green, g (s)					35.8	35.8		56.2			56.2	
Actuated g/C Ratio					0.36	0.36		0.56			0.56	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1259	567		1832			2853	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.35		0.17				
v/c Ratio					0.44	0.98		0.29			0.37	
Uniform Delay, d1					24.5	31.7		11.5			12.1	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	31.2		0.4			0.4	
Delay (s)					24.5	62.9		11.9			12.5	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			46.7			11.9			12.5	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3487		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3487		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	493	54	434	585	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	519	57	457	616	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	567	0	457	616	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	48.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		661						1604		613	2462	
v/s Ratio Prot		c0.13						c0.16		c0.13	0.17	
v/s Ratio Perm												
v/c Ratio		0.67						0.35		0.75	0.25	
Uniform Delay, d1		26.3						12.2		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.6		4.3	0.0	
Delay (s)		28.4						12.8		31.6	3.9	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			12.8			15.7	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3427		1770	3503		1770	3419		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3427		1770	3503		1770	3419		1770	1863	1583
Volume (vph)	290	760	204	139	862	64	183	441	129	139	305	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	215	146	907	67	193	464	136	146	321	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	25	0	0	0	307
Lane Group Flow (vph)	305	993	0	146	969	0	193	575	0	146	321	202
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.3		12.6	30.8		19.9	19.9		21.2	21.2	21.2
Effective Green, g (s)	21.1	40.3		12.6	31.8		19.9	19.9		21.2	21.2	21.2
Actuated g/C Ratio	0.19	0.37		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1256		203	1013		320	619		341	359	305
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.11	c0.17		0.08	c0.17	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.79		0.72	0.96		0.60	0.93		0.43	0.89	0.66
Uniform Delay, d1	43.4	31.1		47.0	38.4		41.4	44.4		39.1	43.3	41.1
Progression Factor	1.00	1.00		1.18	0.98		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.1		4.9	10.4		2.2	17.4		0.9	23.4	5.3
Delay (s)	68.2	36.2		60.5	47.9		43.4	62.0		39.9	66.7	46.4
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		43.6			49.6			57.5			52.1	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	49.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3438		1770	3499		1770	3447	
Flt Permitted	0.19	1.00			0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	363	3385			2657		1770	3499		1770	3447	
Volume (vph)	198	635	260	47	665	148	270	1059	86	186	965	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	49	700	156	284	1115	91	196	1016	213
RTOR Reduction (vph)	0	41	0	0	16	0	0	5	0	0	16	0
Lane Group Flow (vph)	208	901	0	0	889	0	284	1201	0	196	1213	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	158	1477			1159		274	1113		241	1034	
v/s Ratio Prot		0.27					0.16	c0.34		0.11	c0.35	
v/s Ratio Perm	c0.57				0.33							
v/c Ratio	1.32	0.61			0.77		1.04	1.08		0.81	1.17	
Uniform Delay, d1	31.0	23.8			26.3		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	169.6	0.5			3.1		64.2	50.8		18.5	88.3	
Delay (s)	203.7	26.8			29.4		110.7	88.3		64.7	126.8	
Level of Service	F	C			C		F	F		E	F	
Approach Delay (s)		58.8			29.4			92.6			118.2	
Approach LOS		E			C			F			F	

Intersection Summary				
HCM Average Control Delay	80.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	111.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	134	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	141	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			342	341	20	483	341	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	483	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	87	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	397	526	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	168	144	2
Volume Left	1	151	2	1
Volume Right	0	0	141	0
cSH	1599	1596	1037	452
Volume to Capacity	0.00	0.09	0.14	0.00
Queue Length 95th (ft)	0	8	12	0
Control Delay (s)	0.4	6.8	9.0	13.0
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.0	13.0
Approach LOS			A	B

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	30.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 No Project PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	94	79	6	137	106	227	10	424	209	89	182	66	361	16	33	356	114	20

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	179	470	643	337	377	389	134
Delay	48.5	0.5	45.9	30.5	1.0	54.5	52.6
LOS	D	A	D	C	A	D	D

HCM Average Control Delay	**45.6**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.90			1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1672			1861	1583	1770	1789	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1672			1846	1583	1770	1789	
Volume (vph)	94	79	6	137	106	227	10	424	209	89	182	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	83	6	144	112	239	11	446	220	94	192	69
RTOR Reduction (vph)	0	2	0	0	61	0	0	0	145	0	10	0
Lane Group Flow (vph)	99	87	0	144	290	0	0	457	75	94	251	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	10.8	10.8		41.7	41.7			30.2	30.2	9.4	43.6	
Effective Green, g (s)	10.8	10.8		41.7	41.7			30.2	30.2	9.4	43.6	
Actuated g/C Ratio	0.10	0.10		0.39	0.39			0.28	0.28	0.09	0.40	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	177	184		683	645			516	442	154	722	
v/s Ratio Prot	c0.06	0.05		0.08	c0.17					c0.05	0.14	
v/s Ratio Perm								c0.25	0.05			
v/c Ratio	0.56	0.47		0.21	0.45			0.89	0.17	0.61	0.35	
Uniform Delay, d1	46.4	46.0		22.2	24.7			37.3	29.5	47.6	22.4	
Progression Factor	1.00	1.00		0.03	0.01			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	1.4		0.0	0.1			16.5	0.1	5.0	0.2	
Delay (s)	49.4	47.4		0.8	0.3			53.8	29.6	52.5	22.6	
Level of Service	D	D		A	A			D	C	D	C	
Approach Delay (s)		48.5			0.5			45.9			30.5	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	29.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1852		1770	1863	1751	
Flt Permitted	1.00		0.16	1.00	0.96	
Satd. Flow (perm)	1852		296	1863	1751	
Volume (vph)	361	16	33	356	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	380	17	35	375	120	21
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	396	0	35	375	136	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	87.6		25.2	25.2	12.5	
Effective Green, g (s)	87.6		25.2	25.2	12.5	
Actuated g/C Ratio	0.81		0.23	0.23	0.12	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1501		69	434	202	
v/s Ratio Prot	c0.21			c0.20	c0.08	
v/s Ratio Perm			0.12			
v/c Ratio	0.26		0.51	0.86	0.67	
Uniform Delay, d1	2.5		36.1	39.8	45.8	
Progression Factor	0.40		1.00	1.00	1.00	
Incremental Delay, d2	0.1		4.2	16.0	6.7	
Delay (s)	1.0		40.3	55.8	52.6	
Level of Service	A		D	E	D	
Approach Delay (s)	1.0			54.5	52.6	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	31.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	40.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1006: 65th St & Hollis St — 2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1771			1799		1770	1842		1770	1753	
Flt Permitted		0.82			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1485			1570		1770	1842		1770	1753	
Volume (vph)	152	199	68	36	101	20	163	657	44	19	354	168
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	209	72	38	106	21	172	692	46	20	373	177
RTOR Reduction (vph)	0	13	0	0	9	0	0	4	0	0	31	0
Lane Group Flow (vph)	0	428	0	0	156	0	172	734	0	20	519	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		432			457		222	874		29	641	
v/s Ratio Prot							c0.10	c0.40		0.01	0.30	
v/s Ratio Perm		c0.29			0.10							
v/c Ratio		0.99			0.34		0.77	0.84		0.69	0.81	
Uniform Delay, d1		19.4			15.3		23.3	12.6		26.9	15.7	
Progression Factor		1.00			1.00		0.91	1.06		0.99	1.04	
Incremental Delay, d2		40.9			0.3		13.1	8.4		40.4	8.8	
Delay (s)		60.3			15.7		34.3	21.8		67.0	25.1	
Level of Service		E			B		C	C		E	C	
Approach Delay (s)		60.3			15.7			24.1			26.6	
Approach LOS		E			B			C			C	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1007: 64th St & Christie Ave — 2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	138	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	145	71	5	146	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	119	234	153
Volume Left (vph)	4	107	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.13	0.04
Departure Headway (s)	4.6	5.1	4.5	4.7
Degree Utilization, x	0.10	0.17	0.29	0.20
Capacity (veh/h)	709	652	768	717
Control Delay (s)	8.1	9.1	9.3	8.9
Approach Delay (s)	8.1	9.1	9.3	8.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.0		
HCM Level of Service	A		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	47	32	16	586	253	76
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	49	34	17	617	266	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	957	306	346			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	957	306	346			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	95	99			
cM capacity (veh/h)	282	734	1213			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	83	17	617	346
Volume Left	49	17	0	0
Volume Right	34	0	0	80
cSH	376	1213	1700	1700
Volume to Capacity	0.22	0.01	0.36	0.20
Queue Length 95th (ft)	21	1	0	0
Control Delay (s)	17.3	8.0	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.3	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.5	
Intersection Capacity Utilization		42.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1646		1770	3539	1452		3452	
Flt Permitted		0.97	1.00	0.95	0.97		0.41	1.00	1.00		0.92	
Satd. Flow (perm)		1798	1583	1681	1646		767	3539	1452		3194	
Volume (vph)	12	5	95	517	63	53	137	367	126	22	355	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	544	66	56	144	386	133	23	374	63
RTOR Reduction (vph)	0	0	94	0	7	0	0	0	82	0	12	0
Lane Group Flow (vph)	0	18	6	342	317	0	144	386	51	0	448	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	739		294	1358	557		1225	
v/s Ratio Prot		c0.01		c0.20	0.19			0.11				
v/s Ratio Perm			0.00				c0.19		0.04		0.14	
v/c Ratio		0.17	0.06	0.45	0.43		0.49	0.28	0.09		0.37	
Uniform Delay, d1		49.3	49.0	21.0	20.7		25.7	23.5	21.7		24.3	
Progression Factor		1.00	1.00	0.22	0.19		0.90	0.82	1.11		1.00	
Incremental Delay, d2		0.6	0.2	1.8	1.7		4.1	0.4	0.2		0.8	
Delay (s)		49.8	49.2	6.5	5.7		27.3	19.7	24.2		25.2	
Level of Service		D	D	A	A		C	B	C		C	
Approach Delay (s)		49.3			6.1			22.3			25.2	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	19.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	109	37	447	662	195	187
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	115	39	471	697	205	197
RTOR Reduction (vph)	0	26	0	0	0	130
Lane Group Flow (vph)	115	13	471	697	205	67
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	11.8	37.9	22.6	91.2	65.1	11.8
Effective Green, g (s)	11.3	37.4	22.1	90.7	64.6	11.3
Actuated g/C Ratio	0.10	0.34	0.20	0.82	0.59	0.10
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	182	538	690	1536	1094	163
v/s Ratio Prot	c0.06	0.01	c0.14	c0.37	0.11	0.04
v/s Ratio Perm						
v/c Ratio	0.63	0.02	0.68	0.45	0.19	0.41
Uniform Delay, d1	47.4	24.2	40.7	2.7	10.5	46.2
Progression Factor	0.69	0.21	1.28	0.14	1.00	1.00
Incremental Delay, d2	6.9	0.0	2.4	0.8	0.4	1.7
Delay (s)	39.5	5.0	54.4	1.2	10.9	47.9
Level of Service	D	A	D	A	B	D
Approach Delay (s)	30.8			22.7	29.0	
Approach LOS	C			C	C	

Intersection Summary				
HCM Average Control Delay	24.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Volume (vph)	172	370	60	579	14	0	11	686	1211	269	554	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	609	15	0	12	722	1275	283	583	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	305	319	0	12	722	1275	283	630	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	20.3	20.3		1.2	23.5	93.0	17.4	39.7	
Effective Green, g (s)	15.8	15.8	15.8	20.3	20.3		0.7	24.0	93.0	16.9	40.2	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	301	317	269	367	369		13	913	1583	322	790	
v/s Ratio Prot	0.10	c0.21		0.18	0.19		0.01	0.20		0.16	0.34	
v/s Ratio Perm			0.03						c0.81			
v/c Ratio	0.60	1.23	0.17	0.83	0.86		0.92	0.79	0.81	0.88	0.80	
Uniform Delay, d1	35.7	38.6	33.0	34.7	35.0		46.1	32.2	0.0	37.1	22.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.3	126.9	0.1	14.5	18.4		205.3	4.6	4.5	22.1	5.4	
Delay (s)	38.0	165.5	33.1	49.2	53.4		251.4	36.7	4.5	59.2	28.3	
Level of Service	D	F	C	D	D		F	D	A	E	C	
Approach Delay (s)		115.9			51.3			17.5			37.9	
Approach LOS		F			D			B			D	

Intersection Summary				
HCM Average Control Delay	41.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2976	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2976	1399				3433		1583
Volume (vph)	140	403	575	0	522	1667	0	0	0	905	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	1755	0	0	0	953	0	347
RTOR Reduction (vph)	0	224	0	0	185	0	0	0	0	0	0	205
Lane Group Flow (vph)	147	805	0	0	1002	1117	0	0	0	953	0	142
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	68.2			44.2	110.0				33.3		33.3
Effective Green, g (s)	20.0	68.2			44.2	110.0				33.8		33.8
Actuated g/C Ratio	0.18	0.62			0.40	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2001			1196	1399				1055		486
v/s Ratio Prot	0.08	0.25			0.34							0.09
v/s Ratio Perm						c0.80				c0.28		
v/c Ratio	0.46	0.40			0.84	0.80				0.90		0.29
Uniform Delay, d1	40.2	10.6			29.7	0.0				36.5		29.0
Progression Factor	1.00	1.00			0.66	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			0.7	0.5				10.7		0.2
Delay (s)	40.5	11.2			20.2	0.5				47.3		29.2
Level of Service	D	B			C	A				D		C
Approach Delay (s)		14.9			10.6			0.0			42.5	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	77.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1517	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1517	659			
Volume (vph)	142	1164	0	0	1619	406	571	226	1055	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1225	0	0	1704	427	601	238	1111	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	270	0	76	10	0	0	0
Lane Group Flow (vph)	149	1225	0	0	1704	157	601	717	546	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	510	335			
v/s Ratio Prot	0.08	c0.34			c0.37		0.36	0.47	c0.83			
v/s Ratio Perm						0.12						
v/c Ratio	0.44	0.82			1.01	0.32	1.06	1.41	1.63			
Uniform Delay, d1	39.3	28.4			35.0	25.2	36.5	36.5	27.0			
Progression Factor	1.55	0.37			0.93	1.78	1.00	1.00	1.00			
Incremental Delay, d2	2.8	3.6			17.7	0.8	55.9	193.9	297.0			
Delay (s)	63.8	14.2			50.4	45.8	92.4	230.4	324.0			
Level of Service	E	B			D	D	F	F	F			
Approach Delay (s)		19.6			49.4			214.5			0.0	
Approach LOS		B			D			F			A	

Intersection Summary				
HCM Average Control Delay	100.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.37			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1812	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1812	2628
Volume (vph)	419	1021	779	325	1174	222	132	16	66	207	163	611
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	441	1075	820	342	1236	234	139	17	69	218	172	643
RTOR Reduction (vph)	0	3	135	0	0	26	0	0	60	0	0	86
Lane Group Flow (vph)	441	1121	636	342	1236	208	76	80	9	0	390	557
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	0.13	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.22	0.21
v/s Ratio Perm						0.13			0.01			
v/c Ratio	0.83	1.11	1.13	1.25	1.16	0.44	0.36	0.37	0.04		0.79	0.50
Uniform Delay, d1	45.1	38.5	29.5	46.5	38.5	31.0	43.9	44.0	42.1		37.1	22.9
Progression Factor	1.22	1.02	1.06	1.05	1.06	1.12	1.02	1.03	2.10		0.99	0.84
Incremental Delay, d2	1.5	51.6	58.9	133.5	82.3	2.3	0.7	0.7	0.1		11.3	1.5
Delay (s)	56.5	90.8	90.3	182.5	123.0	37.0	45.6	45.8	88.7		48.0	20.7
Level of Service	E	F	F	F	F	D	D	D	F		D	C
Approach Delay (s)		84.2			123.1			58.9			31.0	
Approach LOS		F			F			E			C	

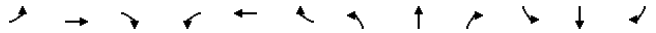
Intersection Summary				
HCM Average Control Delay	86.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3525			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3525			1863	
Volume (vph)	121	156	824	0	0	0	0	1087	25	0	231	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1144	26	0	243	0
RTOR Reduction (vph)	0	0	260	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	197	607	0	0	0	0	1169	0	0	243	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2067			610	
v/s Ratio Prot	0.06	0.06	c0.22					c0.33			0.13	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.36					0.57			0.40	
Uniform Delay, d1	25.4	25.4	11.3					14.1			28.6	
Progression Factor	1.26	1.24	2.59					1.00			1.41	
Incremental Delay, d2	0.6	0.3	0.1					1.1			1.9	
Delay (s)	32.7	31.9	29.2					15.2			42.2	
Level of Service	C	C	C					B			D	
Approach Delay (s)		30.0			0.0			15.2			42.2	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	24.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3386		1770	3478		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3386		1770	3478		1770	1846		1770	1863	1539
Volume (vph)	190	779	218	20	693	56	484	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	820	229	21	729	59	509	537	28	72	256	160
RTOR Reduction (vph)	0	22	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1027	0	21	782	0	509	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	951		34	727		677	707		304	320	264
v/s Ratio Prot	c0.11	c0.30		0.01	c0.22		0.29	c0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.08		0.62	1.08		0.75	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.6		53.6	43.5		29.4	30.2		39.3	43.7	38.4
Progression Factor	1.29	0.92		1.00	1.00		1.01	1.00		1.23	1.18	2.49
Incremental Delay, d2	148.0	52.1		29.0	55.8		4.6	6.1		0.4	12.3	0.2
Delay (s)	212.6	88.5		82.5	99.3		34.3	36.4		48.8	64.1	95.7
Level of Service	F	F		F	F		C	D		D	E	F
Approach Delay (s)		108.3			98.9			35.4			72.2	
Approach LOS		F			F			D			E	

Intersection Summary					
HCM Average Control Delay	79.7	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	86.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3416		1770	3477		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3416		1770	3477		1770	3491		1770	3477	
Volume (vph)	151	641	194	102	461	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	675	204	107	485	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	32	0	0	12	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	847	0	107	537	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.8		8.3	22.4		12.9	32.0		9.9	29.0	
Effective Green, g (s)	9.7	25.3		7.3	22.9		11.9	32.5		8.9	29.5	
Actuated g/C Ratio	0.11	0.28		0.08	0.25		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	960		144	885		234	1261		175	1140	
v/s Ratio Prot	c0.09	c0.25		0.06	0.15		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.88		0.74	0.61		0.80	1.11		0.67	1.09	
Uniform Delay, d1	39.4	30.9		40.4	29.6		37.9	28.8		39.2	30.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	9.6		18.6	1.2		17.8	61.3		9.8	55.5	
Delay (s)	64.8	40.6		59.0	30.8		55.7	90.1		49.0	85.8	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		44.3			35.4			86.0			82.6	
Approach LOS		D			D			F			F	

Intersection Summary					
HCM Average Control Delay	68.6	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.95				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	86.6%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1018: 40th St & Horton St

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3401		1770	3539	1523	1770	1691			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3401		1770	3539	1523	1770	1691			1814	
Volume (vph)	26	657	190	80	670	55	207	132	124	96	182	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	692	200	84	705	58	218	139	131	101	192	20
RTOR Reduction (vph)	0	21	0	0	0	33	0	38	0	0	2	0
Lane Group Flow (vph)	27	871	0	84	705	25	218	232	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	38.9		7.6	42.3	42.3	18.0	18.0			21.0	
Effective Green, g (s)	3.7	38.9		7.1	42.3	42.3	17.5	17.5			20.5	
Actuated g/C Ratio	0.04	0.39		0.07	0.42	0.42	0.18	0.18			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1323		126	1497	644	310	296			372	
v/s Ratio Prot	0.02	c0.26		c0.05	c0.20		0.12	c0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.66		0.67	0.47	0.04	0.70	0.78			0.83	
Uniform Delay, d1	47.1	25.1		45.3	20.8	16.9	38.8	39.4			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	2.6		11.4	1.1	0.1	6.6	12.3			14.6	
Delay (s)	50.2	27.7		56.7	21.9	17.0	45.4	51.7			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		28.3			25.0			48.9			52.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	34.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	76.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1019: 40th St & Hollis St

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3437		1770	3539	1495	1770	1863	1520	1770	1824	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3437		1770	3539	1495	1770	1863	1520	1770	1824	
Volume (vph)	46	674	125	141	583	195	207	323	133	231	425	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	132	148	614	205	218	340	140	243	447	54
RTOR Reduction (vph)	0	15	0	0	0	125	0	0	101	0	4	0
Lane Group Flow (vph)	48	826	0	148	614	80	218	340	39	243	497	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.4		11.9	39.0	39.0	12.5	28.7	28.7	12.5	28.7	
Effective Green, g (s)	4.8	32.4		11.4	39.0	39.0	12.0	28.2	28.2	12.0	28.2	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.28	0.28	0.12	0.28	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1114		202	1380	583	212	525	429	212	514	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.12	0.18		c0.14	c0.27	
v/s Ratio Perm						0.05			0.03			
v/c Ratio	0.56	0.74		0.73	0.44	0.14	1.03	0.65	0.09	1.15	0.97	
Uniform Delay, d1	46.6	30.1		42.8	22.5	19.7	44.0	31.5	26.5	44.0	35.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.95	
Incremental Delay, d2	6.8	4.5		12.2	1.0	0.5	69.4	2.4	0.1	103.6	28.9	
Delay (s)	53.4	34.5		55.0	23.6	20.1	113.4	34.0	26.5	146.5	62.6	
Level of Service	D	C		D	C	C	F	C	C	F	E	
Approach Delay (s)		35.6			27.6			57.3			90.0	
Approach LOS		D			C			E			F	

Intersection Summary				
HCM Average Control Delay	50.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1020: 40th St & Harlan St — 2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	962	44	96	917	12	33	12	98	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1013	46	101	965	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	978			1059			1781	2262	529	1836	2279	489
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	978			1059			1781	2262	529	1836	2279	489
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			85			1	62	79	100	74	98
cM capacity (veh/h)	701			653			35	33	494	23	32	525

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	675	384	101	644	334	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	701	1700	1700	653	1700	1700	35	273	64
Volume to Capacity	0.03	0.40	0.23	0.15	0.38	0.20	1.18	0.40	0.28
Queue Length 95th (ft)	3	0	0	14	0	0	108	46	25
Control Delay (s)	10.3	0.0	0.0	11.5	0.0	0.0	386.3	26.7	81.8
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			124.8		81.8
Approach LOS							F		F

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1021: 40th St & Emery St — 2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3426		1770	3488			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3426		1770	3488			1809	1555		1813	
Volume (vph)	30	912	159	158	834	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	960	167	166	878	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1115	0	166	934	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1220		221	1392			385	331		265	
v/s Ratio Prot	0.02	c0.33		0.09	c0.27			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.91		0.75	0.67			0.87	0.27		0.71	
Uniform Delay, d1	42.9	30.7		42.2	24.7			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	12.0		1.3	0.2			18.9	0.3		8.2	
Delay (s)	43.5	42.7		50.7	15.5			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		42.8			20.8			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	35.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3300		1770	3370		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3300		1770	3370		3433	3531		1770	3479	
Volume (vph)	207	665	356	47	478	180	475	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	700	375	49	503	189	500	1266	16	281	1236	107
RTOR Reduction (vph)	0	69	0	0	39	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1006	0	49	653	0	500	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	937		81	640		446	1285		258	1322	
v/s Ratio Prot	c0.12	c0.30		0.03	0.19		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.07		0.60	1.02		1.12	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.86		1.02	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.1	44.5		7.9	39.5		80.0	24.4		81.9	27.5	
Delay (s)	42.7	75.2		55.5	77.5		123.5	56.2		124.6	58.5	
Level of Service	D	E		E	E		F	E		F	E	
Approach Delay (s)		69.7			76.1			75.1			70.0	
Approach LOS		E			E			E			E	

Intersection Summary				
HCM Average Control Delay	72.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	96.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3450			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3450			3117			2416	
Volume (vph)	22	809	17	45	563	97	19	292	107	81	229	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	852	18	47	593	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	21	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	868	0	47	674	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1904			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.47		0.58	0.35			0.62			0.80	
Uniform Delay, d1	24.5	7.6		23.4	6.2			18.5			19.3	
Progression Factor	1.02	1.22		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.1	9.4		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.1			8.2			20.5			28.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1024: Mandela Pkwy & Horton St — 2010 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	337	89	11	86	103	46	19	83	50	65	59	274
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	355	94	12	91	108	48	20	87	53	68	62	288

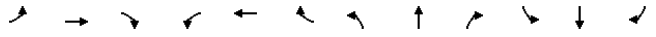
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	355	105	247	160	419
Volume Left (vph)	355	0	91	20	68
Volume Right (vph)	0	12	48	53	288
Hadj (s)	0.53	-0.04	-0.01	-0.14	-0.35
Departure Headway (s)	7.6	7.0	7.1	7.2	6.3
Degree Utilization, x	0.75	0.20	0.49	0.32	0.73
Capacity (veh/h)	453	494	457	414	547
Control Delay (s)	28.4	10.6	16.5	13.6	24.4
Approach Delay (s)	24.3		16.5	13.6	24.4
Approach LOS	C		C	B	C

Intersection Summary				
Delay	21.5			
HCM Level of Service	C			
Intersection Capacity Utilization	76.0%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1025: W. MacArthur Blvd & Emery Street — 2010 PM

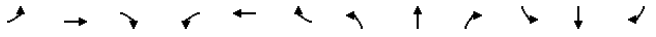
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.96	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.5			12.4			10.5	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	17.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	63.3	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3505	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3505	
Volume (vph)	112	332	32	121	216	36	0	1422	92	0	1483	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1497	97	0	1561	106
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1590	0	0	1663	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1969	
v/s Ratio Prot					c0.11			0.45			c0.47	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.81			0.84	
Uniform Delay, d1		43.5			42.5			18.4			19.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.7			4.7	
Delay (s)		109.8			47.1			22.1			23.8	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.1			23.8	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.77			1.00	
Satd. Flow (perm)					3514	1583		2715			5075	
Volume (vph)	0	0	0	64	385	732	49	983	0	0	1502	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1035	0	0	1581	22
RTOR Reduction (vph)	0	0	0	0	0	81	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	690	0	1087	0	0	1601	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1659			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.40				
v/c Ratio					0.45	1.45		0.66			0.52	
Uniform Delay, d1					25.5	31.5		11.4			9.9	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	215.0		2.0			0.6	
Delay (s)					25.6	246.5		13.4			10.6	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			162.6			13.4			10.6	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM Average Control Delay	59.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3499		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3499		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	950	78	749	853	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1000	82	788	898	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1076	0	788	898	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1323		889	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.25	
v/s Ratio Perm												
v/c Ratio		0.96						0.81		0.89	0.38	
Uniform Delay, d1		40.4						30.7		39.2	7.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						5.6		10.3	0.0	
Delay (s)		60.4						36.3		49.5	7.9	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			36.3			27.3	
Approach LOS		E			A			D			C	

Intersection Summary				
HCM Average Control Delay	37.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	105	12	1	0	3	124	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	135	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	391	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	391	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	87	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1067	467	603	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	138	12
Volume Left	0	114	0	1
Volume Right	0	1	135	3
cSH	1604	1605	1048	664
Volume to Capacity	0.00	0.07	0.13	0.02
Queue Length 95th (ft)	0	6	11	1
Control Delay (s)	0.0	6.7	9.0	10.5
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.0	10.5
Approach LOS			A	B

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 No Project Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	59	46	13	115	67	91	13	427	211	83	292	39	318	23	39	213	60	13

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	118	273	651	414	341	252	73
Delay	41.8	0.5	32.4	22.7	0.9	38.6	42.0
LOS	D	A	C	C	A	D	D

HCM Average Control Delay	**32.0**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 No Project SAT
5/7/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.96			1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.91			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1775		1770	1634			1860	1583	1770	1817	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1775		1770	1634			1836	1583	1770	1817	
Volume (vph)	59	46	13	115	67	91	13	427	211	83	292	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	50	14	125	73	99	14	464	229	90	317	42
RTOR Reduction (vph)	0	9	0	0	43	0	0	0	135	0	3	0
Lane Group Flow (vph)	64	55	0	125	129	0	0	478	94	90	356	0
Confl. Peds. (#/hr)			20			20						20
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	8.5	8.5		30.9	30.9			30.8	30.8	8.8	43.6	
Effective Green, g (s)	8.5	8.5		30.9	30.9			30.8	30.8	8.8	43.6	
Actuated g/C Ratio	0.09	0.09		0.33	0.33			0.32	0.32	0.09	0.46	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	158	159		576	531			595	513	164	834	
v/s Ratio Prot	c0.04	0.03		0.07	c0.08					c0.05	0.20	
v/s Ratio Perm								c0.26	0.06			
v/c Ratio	0.41	0.35		0.22	0.24			0.80	0.18	0.55	0.43	
Uniform Delay, d1	40.9	40.6		23.3	23.5			29.3	23.1	41.2	17.3	
Progression Factor	1.00	1.00		0.04	0.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	1.0		0.1	0.1			7.5	0.1	2.0	0.3	
Delay (s)	42.1	41.6		1.0	0.1			36.9	23.2	43.2	17.5	
Level of Service	D	D		A	A			D	C	D	B	
Approach Delay (s)		41.8			0.5			32.4			22.7	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	24.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

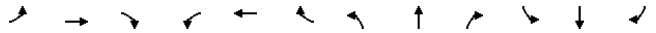
HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 No Project SAT
5/7/2007

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1846		1770	1863	1725	
Flt Permitted	1.00		0.22	1.00	0.96	
Satd. Flow (perm)	1846		403	1863	1725	
Volume (vph)	318	23	39	213	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	346	25	42	232	65	14
RTOR Reduction (vph)	2	0	0	0	6	0
Lane Group Flow (vph)	369	0	42	232	73	0
Confl. Peds. (#/hr)						20
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	78.6		18.5	18.5	8.4	
Effective Green, g (s)	78.6		18.5	18.5	8.4	
Actuated g/C Ratio	0.83		0.19	0.19	0.09	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1527		78	363	153	
v/s Ratio Prot	c0.20			c0.12	c0.04	
v/s Ratio Perm			0.10			
v/c Ratio	0.24		0.54	0.64	0.47	
Uniform Delay, d1	1.8		34.4	35.2	41.2	
Progression Factor	0.45		1.00	1.00	1.00	
Incremental Delay, d2	0.1		5.5	3.2	0.8	
Delay (s)	0.9		39.9	38.4	42.0	
Level of Service	A		D	D	D	
Approach Delay (s)	0.9			38.6	42.0	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	19.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	108	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	117	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	215	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.10	-0.22	0.04
Departure Headway (s)	4.2	4.7	4.1	4.5
Degree Utilization, x	0.02	0.15	0.25	0.12
Capacity (veh/h)	770	714	846	763
Control Delay (s)	7.3	8.5	8.4	8.1
Approach Delay (s)	7.3	8.5	8.4	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.3	
HCM Level of Service			A	
Intersection Capacity Utilization		32.5%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	54	21	9	641	360	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	23	10	697	391	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked						
vC, conflicting volume	1145	428	465			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1145	428	465			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	73	96	99			
cM capacity (veh/h)	219	627	1096			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	82	10	697	465
Volume Left	59	10	0	0
Volume Right	23	0	0	74
cSH	268	1096	1700	1700
Volume to Capacity	0.30	0.01	0.41	0.27
Queue Length 95th (ft)	31	1	0	0
Control Delay (s)	24.2	8.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	24.2	0.1		0.0
Approach LOS	C			

Intersection Summary				
Average Delay			1.6	
Intersection Capacity Utilization		44.7%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.97		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1638		1770	3539	1489		3455	
Flt Permitted		0.97	1.00	0.95	0.97		0.40	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1638		749	3539	1489		3180	
Volume (vph)	31	22	136	724	78	72	151	306	268	25	335	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	787	85	78	164	333	291	27	364	60
RTOR Reduction (vph)	0	0	111	0	7	0	0	0	190	0	10	0
Lane Group Flow (vph)	0	58	37	491	452	0	164	333	101	0	441	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	35.4	35.4		38.6	38.6	38.6		38.6	
Effective Green, g (s)		24.5	24.5	35.4	35.4		38.1	38.1	38.1		38.1	
Actuated g/C Ratio		0.22	0.22	0.32	0.32		0.35	0.35	0.35		0.35	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	541	527		259	1226	516		1101	
v/s Ratio Prot		c0.03		c0.29	0.28			0.09				
v/s Ratio Perm			0.02				c0.22		0.07		0.14	
v/c Ratio		0.14	0.10	0.91	0.86		0.63	0.27	0.20		0.40	
Uniform Delay, d1		34.3	34.0	35.7	34.9		30.1	25.9	25.2		27.3	
Progression Factor		1.00	1.00	0.53	0.50		0.46	0.47	0.11		1.00	
Incremental Delay, d2		0.7	0.6	17.1	11.7		8.1	0.4	0.6		1.1	
Delay (s)		35.1	34.6	35.9	29.3		22.0	12.5	3.3		28.4	
Level of Service		D	C	D	C		C	B	A		C	
Approach Delay (s)		34.7			32.7			11.1			28.4	
Approach LOS		C			C			B			C	

Intersection Summary				
HCM Average Control Delay	24.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	227	72	655	865	235	234
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	247	78	712	940	255	254
RTOR Reduction (vph)	0	41	0	0	0	23
Lane Group Flow (vph)	247	37	712	940	255	231
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	20.1	52.2	28.6	82.9	50.8	74.4
Effective Green, g (s)	19.6	51.7	28.1	82.4	50.3	73.9
Actuated g/C Ratio	0.18	0.47	0.26	0.75	0.46	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	315	744	877	1396	852	1063
v/s Ratio Prot	c0.14	0.02	c0.21	c0.50	0.14	0.15
v/s Ratio Perm						
v/c Ratio	0.78	0.05	0.81	0.67	0.30	0.22
Uniform Delay, d1	43.2	15.8	38.5	7.0	18.8	6.9
Progression Factor	0.64	0.57	0.52	2.10	1.00	1.00
Incremental Delay, d2	11.3	0.0	3.3	1.5	0.9	0.1
Delay (s)	38.8	9.0	23.4	16.1	19.7	7.0
Level of Service	D	A	C	B	B	A
Approach Delay (s)	31.7			19.3	13.4	
Approach LOS	C			B	B	

Intersection Summary				
HCM Average Control Delay	19.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Volume (vph)	26	21	7	855	13	16	41	291	1022	135	428	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	929	14	17	45	316	1111	147	465	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	487	472	0	45	316	1111	147	496	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.3	26.3		3.9	18.3	72.1	8.6	23.0	
Effective Green, g (s)	2.9	2.9	2.9	26.3	26.3		3.4	18.8	72.1	8.1	23.5	
Actuated g/C Ratio	0.04	0.04	0.04	0.36	0.36		0.05	0.26	1.00	0.11	0.33	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	75	64	613	614		83	923	1583	199	598	
v/s Ratio Prot	0.02	0.01		0.29	0.28		0.03	0.09		0.08	c0.27	
v/s Ratio Perm			0.00						c0.70			
v/c Ratio	0.39	0.31	0.01	0.79	0.77		0.54	0.34	0.70	0.74	0.83	
Uniform Delay, d1	33.7	33.6	33.2	20.5	20.2		33.6	21.6	0.0	31.0	22.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	6.8	5.5		3.8	0.2	2.6	11.6	9.1	
Delay (s)	35.1	34.5	33.2	27.3	25.7		37.4	21.8	2.6	42.6	31.6	
Level of Service	D	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.6			26.5			7.8			34.1	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	72.1	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			3021	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			3021	1399				3433		1583
Volume (vph)	113	281	1	0	359	1251	0	0	0	1060	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1360	0	0	0	1152	0	263
RTOR Reduction (vph)	0	0	0	0	121	0	0	0	0	0	0	143
Lane Group Flow (vph)	123	306	0	0	626	1003	0	0	0	1152	0	120
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	60.0			44.7	110.0				41.5		41.5
Effective Green, g (s)	11.3	60.0			44.7	110.0				42.0		42.0
Actuated g/C Ratio	0.10	0.55			0.41	1.00				0.38		0.38
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1929			1228	1399				1311		604
v/s Ratio Prot	0.07	0.09			0.21							0.08
v/s Ratio Perm						c0.72				c0.34		
v/c Ratio	0.68	0.16			0.51	0.72				0.88		0.20
Uniform Delay, d1	47.6	12.4			24.5	0.0				31.6		22.7
Progression Factor	1.00	1.00			0.94	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.0	2.1				6.9		0.1
Delay (s)	55.2	12.6			24.1	2.1				38.6		22.9
Level of Service	E	B			C	A				D		C
Approach Delay (s)		24.8			11.5			0.0			35.6	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	111	1228	0	0	1224	397	386	21	1224	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1335	0	0	1330	432	420	23	1330	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	276	0	162	2	0	0	0
Lane Group Flow (vph)	121	1335	0	0	1330	156	420	526	663	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	632	389			
v/s Ratio Prot	0.07	c0.38			c0.29		0.25	0.36	c1.01			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	1.12			0.79	0.30	0.57	0.83	1.71			
Uniform Delay, d1	48.6	36.5			31.4	25.1	23.3	27.4	22.5			
Progression Factor	1.22	0.60			1.08	2.18	1.00	1.00	1.00			
Incremental Delay, d2	11.2	61.6			2.9	1.1	3.2	12.2	328.2			
Delay (s)	70.3	83.5			36.9	55.7	26.5	39.6	350.7			
Level of Service	E	F			D	E	C	D	F			
Approach Delay (s)		82.4			41.5			153.2			0.0	
Approach LOS		F			D			F			A	

Intersection Summary				
HCM Average Control Delay	93.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.53			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1822	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1822	2628
Volume (vph)	443	759	1251	350	668	205	227	62	101	216	270	720
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	482	825	1360	380	726	223	247	67	110	235	293	783
RTOR Reduction (vph)	0	120	85	0	0	61	0	0	98	0	0	34
Lane Group Flow (vph)	482	1331	649	380	726	162	153	161	12	0	528	749
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		497	1266
v/s Ratio Prot	0.14	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.29	0.29
v/s Ratio Perm						0.11			0.01			
v/c Ratio	0.81	1.35	1.25	1.39	0.68	0.35	0.84	0.86	0.07		1.06	0.59
Uniform Delay, d1	43.8	37.5	31.5	46.5	33.9	30.2	48.0	48.2	44.0		40.0	20.7
Progression Factor	1.16	0.90	0.81	1.00	1.00	1.00	1.26	1.26	2.47		0.77	0.34
Incremental Delay, d2	1.2	157.5	111.8	195.1	3.6	2.1	23.7	26.6	0.1		53.2	1.6
Delay (s)	51.9	191.1	137.3	241.6	37.5	32.3	84.3	87.3	108.7		84.1	8.5
Level of Service	D	F	F	F	D	C	F	F	F		F	A
Approach Delay (s)		151.1			95.0			91.8			39.0	
Approach LOS		F			F			F			D	

Intersection Summary				
HCM Average Control Delay	108.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.25			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	110.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1486	21	0	309	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1615	23	0	336	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1637	0	0	336	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.46			0.18	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.88			0.39	
Uniform Delay, d1	21.7	21.7	26.3					22.9			19.6	
Progression Factor	1.03	1.03	1.09					0.57			0.74	
Incremental Delay, d2	0.7	0.3	5.7					4.7			1.3	
Delay (s)	22.9	22.7	34.3					17.8			15.9	
Level of Service	C	C	C					B			B	
Approach Delay (s)		31.3			0.0			17.8			15.9	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3349		1770	3508		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3349		1770	3508		1770	1833		1770	1863	1548
Volume (vph)	86	592	292	38	714	36	220	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	643	317	41	776	39	239	238	24	39	250	103
RTOR Reduction (vph)	0	80	0	0	5	0	0	6	0	0	0	82
Lane Group Flow (vph)	93	880	0	41	810	0	239	256	0	39	250	21
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.8		2.2	18.0		12.7	12.7		12.6	12.6	12.6
Effective Green, g (s)	4.0	19.8		2.2	18.0		12.7	12.7		12.6	12.6	12.6
Actuated g/C Ratio	0.06	0.31		0.03	0.28		0.20	0.20		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	112	1048		62	998		355	368		352	371	308
v/s Ratio Prot	c0.05	c0.26		0.02	0.23		0.14	c0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.83	0.84		0.66	0.81		0.67	0.70		0.11	0.67	0.07
Uniform Delay, d1	29.3	20.3		30.2	21.1		23.4	23.5		20.8	23.4	20.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.2	6.0		23.4	5.1		5.0	5.7		0.1	4.8	0.1
Delay (s)	67.5	26.3		53.6	26.2		28.4	29.2		20.9	28.2	20.7
Level of Service	E	C		D	C		C	C		C	C	C
Approach Delay (s)		29.9			27.5			28.8			25.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

2010 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3432		1770	3518			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3432		1770	3518			1802	1555		1774	
Volume (vph)	18	995	164	175	1062	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1082	178	190	1154	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	10	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1250	0	190	1185	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1517		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.36		c0.11	0.34			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.82		0.97	0.62			0.76	0.15		0.22	
Uniform Delay, d1	49.4	24.5		44.3	15.8			39.8	35.7		39.7	
Progression Factor	1.05	0.52		0.81	0.67			1.00	1.00		1.00	
Incremental Delay, d2	216.4	4.9		28.1	0.5			9.9	0.2		0.4	
Delay (s)	268.3	17.5		63.9	11.1			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		21.4			18.4			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

2010 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3075		1770	3358		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3075		1770	3358		3433	3511		1770	3339	
Volume (vph)	167	639	396	72	517	102	540	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	695	430	78	562	111	587	988	27	160	1017	200
RTOR Reduction (vph)	0	93	0	0	16	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1032	0	78	657	0	587	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	993		83	816		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.34		0.04	0.20		c0.17	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.04		0.94	0.81		1.07	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.8		47.5	35.6		42.0	29.4		42.9	34.5	
Progression Factor	1.17	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.0	34.4		77.0	8.3		58.2	6.1		15.0	82.9	
Delay (s)	62.5	48.8		124.5	44.0		100.2	35.5		57.8	117.4	
Level of Service	E	D		F	D		F	D		E	F	
Approach Delay (s)		50.7			52.3			59.2			110.5	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	70.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
NO PROJECT ALTERNATIVE
2030

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3382		1770	3502		1770	3434		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3382		1770	3502		1770	3434		1770	1863	1583
Volume (vph)	577	881	371	118	778	59	118	264	66	68	268	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	391	124	819	62	124	278	69	72	282	214
RTOR Reduction (vph)	0	40	0	0	5	0	0	20	0	0	0	178
Lane Group Flow (vph)	607	1278	0	124	876	0	124	327	0	72	282	36
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	49.3		11.1	25.4		14.2	14.2		18.4	18.4	18.4
Effective Green, g (s)	35.0	50.3		11.1	26.4		14.2	14.2		18.4	18.4	18.4
Actuated g/C Ratio	0.32	0.46		0.10	0.24		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1546		179	840		228	443		296	312	265
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.15	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.83		0.69	1.04		0.54	0.74		0.24	0.90	0.14
Uniform Delay, d1	37.5	26.0		47.8	41.8		44.9	46.1		39.8	44.9	39.0
Progression Factor	1.00	1.00		0.89	1.20		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.2		5.2	33.3		2.1	6.0		0.4	27.8	0.2
Delay (s)	98.2	31.2		47.8	83.3		47.0	52.1		40.2	72.7	39.3
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		52.4			78.9			50.7			56.0	
Approach LOS		D			E			D			E	

Intersection Summary					
HCM Average Control Delay	59.4	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.98				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	89.3%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3421		1770	3488		1770	3459	
Flt Permitted	0.19	1.00			0.65		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	346	3451			2220		1770	3488		1770	3459	
Volume (vph)	123	746	148	73	602	162	218	779	83	119	871	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	77	634	171	229	820	87	125	917	164
RTOR Reduction (vph)	0	16	0	0	20	0	0	7	0	0	12	0
Lane Group Flow (vph)	129	925	0	0	862	0	229	900	0	125	1069	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	44.4	44.4			44.4		15.7	36.6		16.0	36.9	
Effective Green, g (s)	44.4	44.4			44.4		15.7	37.6		16.0	37.9	
Actuated g/C Ratio	0.40	0.40			0.40		0.14	0.34		0.15	0.34	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	140	1393			896		253	1192		257	1192	
v/s Ratio Prot		0.27					c0.13	0.26		0.07	c0.31	
v/s Ratio Perm	0.37				c0.39							
v/c Ratio	0.92	0.66			0.96		0.91	0.75		0.49	0.90	
Uniform Delay, d1	31.1	26.7			32.0		46.4	32.1		43.2	34.2	
Progression Factor	0.40	0.43			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.1	0.7			21.2		32.4	4.5		1.5	10.6	
Delay (s)	50.8	12.3			53.2		78.8	36.6		44.7	44.8	
Level of Service	D	B			D		E	D		D	D	
Approach Delay (s)		16.9			53.2			45.1			44.8	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	80	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	84	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	437	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	437	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	92	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	455	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	86	1
Volume Left	0	145	2	0
Volume Right	2	1	84	0
cSH	1545	1616	1055	520
Volume to Capacity	0.00	0.09	0.08	0.00
Queue Length 95th (ft)	0	7	7	0
Control Delay (s)	0.0	5.5	8.7	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.7	11.9
Approach LOS			A	B

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 No Project AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	45	61	5	56	47	222	11	119	42	120	216	152	215	9	50	157	169	14

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	111	325	172	488	224	207	183
Delay	34.8	0.7	32.9	28.6	0.4	28.8	38.2
LOS	C	A	C	C	A	C	D

HCM Average Control Delay	**31.4**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1632			1855	1583	1770	1747	
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1632			1759	1583	1770	1747	
Volume (vph)	45	61	5	56	47	222	11	119	42	120	216	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	64	5	59	49	234	12	125	44	126	227	160
RTOR Reduction (vph)	0	3	0	0	120	0	0	0	38	0	23	0
Lane Group Flow (vph)	47	66	0	59	163	0	0	137	6	126	364	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	8.0	8.0		35.3	35.3			11.7	11.7	10.1	25.8	
Effective Green, g (s)	8.0	8.0		35.3	35.3			11.7	11.7	10.1	25.8	
Actuated g/C Ratio	0.10	0.10		0.44	0.44			0.14	0.14	0.12	0.32	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	175	182		770	710			254	228	220	556	
v/s Ratio Prot	0.03	c0.04		0.03	c0.10					0.07	c0.21	
v/s Ratio Perm								0.08	0.00			
v/c Ratio	0.27	0.36		0.08	0.23			0.54	0.03	0.57	0.66	
Uniform Delay, d1	33.8	34.2		13.4	14.4			32.2	29.8	33.5	23.8	
Progression Factor	1.00	1.00		0.15	0.02			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.9		0.0	0.1			1.7	0.0	2.2	2.5	
Delay (s)	34.4	35.1		2.0	0.4			33.9	29.8	35.7	26.3	
Level of Service	C	D		A	A			C	C	D	C	
Approach Delay (s)		34.8			0.7			32.9			28.6	
Approach LOS		C			A			C			C	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1853		1770	1863	1762	
Flt Permitted	1.00		0.22	1.00	0.96	
Satd. Flow (perm)	1853		401	1863	1762	
Volume (vph)	215	9	50	157	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	226	9	53	165	178	15
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	234	0	53	165	190	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	60.4		18.6	18.6	12.7	
Effective Green, g (s)	60.4		18.6	18.6	12.7	
Actuated g/C Ratio	0.74		0.23	0.23	0.16	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1380		92	427	276	
v/s Ratio Prot	c0.13			0.09	c0.11	
v/s Ratio Perm			c0.13			
v/c Ratio	0.17		0.58	0.39	0.69	
Uniform Delay, d1	3.0		27.7	26.4	32.3	
Progression Factor	0.13		1.00	1.00	1.00	
Incremental Delay, d2	0.0		7.0	0.4	5.9	
Delay (s)	0.4		34.7	26.8	38.2	
Level of Service	A		C	C	D	
Approach Delay (s)	0.4			28.8	38.2	
Approach LOS	A			C	D	

Intersection Summary				
HCM Average Control Delay	21.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	35.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1714			1820		1770	1851		1770	1822	
Flt Permitted		0.91			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1585			1463		1770	1851		1770	1822	
Volume (vph)	58	67	132	37	61	4	36	338	14	23	524	89
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	71	139	39	64	4	38	356	15	24	552	94
RTOR Reduction (vph)	0	76	0	0	2	0	0	2	0	0	10	0
Lane Group Flow (vph)	0	195	0	0	105	0	38	369	0	24	636	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		317			293		85	1003		32	933	
v/s Ratio Prot							c0.02	0.20		0.01	c0.35	
v/s Ratio Perm		c0.12			0.07							
v/c Ratio		0.62			0.36		0.45	0.37		0.75	0.68	
Uniform Delay, d1		18.2			17.2		23.2	6.5		24.4	9.1	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		3.0			0.5		2.7	1.0		62.8	4.0	
Delay (s)		21.3			17.8		23.4	8.5		87.2	13.2	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		21.3			17.8			9.9			15.8	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	79	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	83	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	173	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.17	0.01
Departure Headway (s)	4.4	4.8	4.1	4.3
Degree Utilization, x	0.01	0.09	0.20	0.18
Capacity (veh/h)	742	699	851	807
Control Delay (s)	7.5	8.3	8.1	8.2
Approach Delay (s)	7.5	8.3	8.1	8.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
HCM Level of Service	A		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	43	17	16	146	266	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	45	18	17	154	280	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	474	286	293			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	474	286	293			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	98	99			
cM capacity (veh/h)	542	753	1269			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	63	17	154	293
Volume Left	45	17	0	0
Volume Right	18	0	0	13
cSH	589	1269	1700	1700
Volume to Capacity	0.11	0.01	0.09	0.17
Queue Length 95th (ft)	9	1	0	0
Control Delay (s)	11.8	7.9	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.8	0.8		0.0
Approach LOS	B			

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	24.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1658		1770	3539	1583		3516	
Flt Permitted		0.97	1.00	0.95	0.96		0.56	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1658		1041	3539	1583		3302	
Volume (vph)	39	28	117	329	4	29	60	183	75	17	277	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	346	4	31	63	193	79	18	292	8
RTOR Reduction (vph)	0	0	116	0	8	0	0	0	26	0	2	0
Lane Group Flow (vph)	0	70	7	196	177	0	63	193	53	0	316	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	14.8	14.8		67.8	67.8	67.8		67.8	
Effective Green, g (s)		5.9	5.9	14.8	14.8		67.3	67.3	67.3		67.3	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	249	245		701	2382	1065		2222	
v/s Ratio Prot		c0.04		c0.12	0.11			0.05				
v/s Ratio Perm			0.00				0.06		0.03		c0.10	
v/c Ratio		0.65	0.08	0.79	0.72		0.09	0.08	0.05		0.14	
Uniform Delay, d1		46.1	44.5	41.1	40.6		5.7	5.7	5.5		5.9	
Progression Factor		1.00	1.00	1.61	1.64		0.04	0.06	0.00		1.00	
Incremental Delay, d2		12.1	0.3	14.8	9.9		0.2	0.1	0.1		0.1	
Delay (s)		58.2	44.7	80.8	76.6		0.5	0.4	0.1		6.0	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6			78.8			0.4			6.0	
Approach LOS		D			E			A			A	

Intersection Summary						
HCM Average Control Delay	33.9	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.29					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	41.8%	ICU Level of Service		A		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	37	38	285	183	122	126
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	40	300	193	128	133
RTOR Reduction (vph)	0	30	0	0	0	124
Lane Group Flow (vph)	39	10	300	193	128	9
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	7.6	26.4	15.3	85.4	66.6	7.6
Effective Green, g (s)	7.1	25.9	14.8	84.9	66.1	7.1
Actuated g/C Ratio	0.07	0.26	0.15	0.85	0.66	0.07
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	126	410	508	1582	1231	112
v/s Ratio Prot	c0.02	0.01	c0.09	c0.10	0.07	0.01
v/s Ratio Perm						
v/c Ratio	0.31	0.03	0.59	0.12	0.10	0.08
Uniform Delay, d1	44.1	27.6	39.8	1.3	6.2	43.4
Progression Factor	0.88	2.34	1.10	0.10	1.00	1.00
Incremental Delay, d2	1.4	0.0	1.8	0.2	0.2	0.3
Delay (s)	40.3	64.8	45.6	0.3	6.3	43.7
Level of Service	D	E	D	A	A	D
Approach Delay (s)	52.7			27.9	25.4	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	29.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	29.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1803	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1803	
Volume (vph)	5	21	16	701	79	0	88	103	820	76	259	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	738	83	0	93	108	863	80	273	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	400	421	0	93	108	863	80	338	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.8	2.8	2.8	23.7	23.7		4.7	16.5	62.9	4.4	16.2	
Effective Green, g (s)	2.3	2.3	2.3	23.7	23.7		4.2	17.0	62.9	3.9	16.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.38	0.38		0.07	0.27	1.00	0.06	0.27	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	65	68	58	633	641		118	956	1583	110	479	
v/s Ratio Prot	0.00	0.01		0.24	c0.25		0.05	0.03		0.05	c0.19	
v/s Ratio Perm			0.00						c0.55			
v/c Ratio	0.08	0.32	0.01	0.63	0.66		0.79	0.11	0.55	0.73	0.71	
Uniform Delay, d1	29.3	29.5	29.2	16.0	16.2		28.9	17.3	0.0	29.0	20.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.8	2.2		26.6	0.0	1.4	18.2	4.3	
Delay (s)	29.5	30.6	29.2	17.8	18.4		55.5	17.3	1.4	47.2	25.2	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		29.9			18.1			7.7			29.3	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	62.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Marketplace Redevelopment
2030 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3288			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3288			3390	1441				3433		1583
Volume (vph)	120	236	211	0	741	1000	0	0	0	819	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1053	0	0	0	862	0	151
RTOR Reduction (vph)	0	83	0	0	0	0	0	0	0	0	0	107
Lane Group Flow (vph)	126	387	0	0	780	1053	0	0	0	862	0	44
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.6			39.6	100.0				28.9		28.9
Effective Green, g (s)	19.0	62.6			39.6	100.0				29.4		29.4
Actuated g/C Ratio	0.19	0.63			0.40	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2058			1342	1441				1009		465
v/s Ratio Prot	0.07	0.12			0.23					c0.25		
v/s Ratio Perm						c0.73						0.03
v/c Ratio	0.38	0.19			0.58	0.73				0.85		0.10
Uniform Delay, d1	35.3	7.9			23.7	0.0				33.3		25.6
Progression Factor	1.00	1.00			0.72	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.7				7.1		0.1
Delay (s)	35.6	8.1			18.1	1.7				40.4		25.7
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.9			8.7			0.0			38.2	
Approach LOS		B			A			A			D	

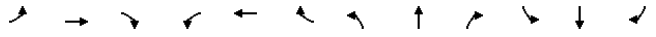
Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB On-Ramp

Marketplace Redevelopment
2030 AM

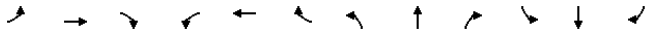
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1464	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1464	1504			
Volume (vph)	82	972	0	0	1096	379	645	2	1225	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1023	0	0	1154	399	679	2	1289	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	271	0	78	32	0	0	0
Lane Group Flow (vph)	86	1023	0	0	1154	128	593	617	650	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	556	677			
v/s Ratio Prot	0.05	c0.20			c0.25		0.35	c0.42	c0.43			
v/s Ratio Perm						0.08						
v/c Ratio	0.27	0.43			0.78	0.25	0.93	1.11	0.96			
Uniform Delay, d1	35.3	17.6			30.8	25.1	29.7	31.0	26.6			
Progression Factor	0.68	0.49			0.46	0.24	1.00	1.00	1.00			
Incremental Delay, d2	1.8	0.5			3.2	0.9	20.0	71.8	24.8			
Delay (s)	25.8	9.1			17.3	7.0	49.6	102.8	51.4			
Level of Service	C	A			B	A	D	F	D			
Approach Delay (s)		10.4			14.7			69.0			0.0	
Approach LOS		B			B			E			A	

Intersection Summary			
HCM Average Control Delay	36.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



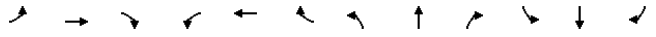
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1794	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1794	2628
Volume (vph)	261	1601	334	75	843	68	42	3	42	147	45	596
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	261	1601	334	75	843	68	42	3	42	147	45	596
RTOR Reduction (vph)	0	0	145	0	0	12	0	0	39	0	0	194
Lane Group Flow (vph)	261	1601	189	75	843	56	22	23	3	0	192	402
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		538	1317
v/s Ratio Prot	0.08	c0.47	c0.13	0.04	c0.24		0.01	0.01			c0.11	0.15
v/s Ratio Perm						0.04			0.00			
v/c Ratio	0.38	1.16	0.25	0.67	0.88	0.13	0.19	0.20	0.03		0.36	0.31
Uniform Delay, d1	34.5	29.6	13.4	45.8	35.0	27.6	43.9	43.9	43.4		27.4	14.7
Progression Factor	1.12	0.60	0.35	1.00	1.00	1.00	1.00	1.00	1.00		1.19	1.03
Incremental Delay, d2	1.0	76.5	0.1	11.2	11.5	0.6	0.6	0.6	0.1		1.7	0.5
Delay (s)	39.5	94.1	4.8	57.0	46.5	28.2	44.5	44.5	43.5		34.5	15.7
Level of Service	D	F	A	E	D	C	D	D	D		C	B
Approach Delay (s)		74.0			46.0			44.0			20.3	
Approach LOS		E			D			D			C	

Intersection Summary				
HCM Average Control Delay	56.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



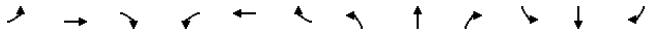
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	221	0	0	0	0	477	9	0	162	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	502	9	0	171	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	510	0	0	171	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.14			0.09	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.22			0.16	
Uniform Delay, d1	26.8	26.8	21.1					7.4			10.7	
Progression Factor	0.99	0.98	0.89					1.00			0.96	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.3	
Delay (s)	26.7	26.4	18.8					7.6			10.6	
Level of Service	C	C	B					A			B	
Approach Delay (s)		20.9			0.0			7.6			10.6	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.18			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3344		1770	3482		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3344		1770	3482		1770	1839		1770	1863	1583
Volume (vph)	405	481	279	36	518	63	273	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	506	294	38	545	66	287	286	27	32	306	115
RTOR Reduction (vph)	0	73	0	0	9	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	727	0	38	602	0	287	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	22.6	39.4		5.7	22.5		20.4	20.4		19.5	19.5	19.5
Effective Green, g (s)	22.1	39.9		5.2	23.0		19.9	19.9		19.0	19.0	19.0
Actuated g/C Ratio	0.22	0.40		0.05	0.23		0.20	0.20		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	391	1334		92	801		352	366		336	354	301
v/s Ratio Prot	c0.24	0.22		0.02	c0.17		0.16	c0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.09	0.55		0.41	0.75		0.82	0.85		0.10	0.86	0.07
Uniform Delay, d1	39.0	23.1		45.9	35.8		38.3	38.6		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.01	1.02		0.75	0.80	1.33
Incremental Delay, d2	71.7	1.6		3.0	6.4		13.5	16.3		0.1	17.7	0.1
Delay (s)	110.7	24.7		48.9	42.3		52.3	55.4		25.2	49.1	44.2
Level of Service	F	C		D	D		D	E		C	D	D
Approach Delay (s)		54.6			42.6			53.9			46.2	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	50.5	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	82.5%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3381		1770	3517		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3381		1770	3517		1770	3497		1770	3487	
Volume (vph)	103	301	127	105	494	22	125	706	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	317	134	111	520	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	51	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	400	0	111	540	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	17.7		10.8	20.5		12.5	49.3		7.2	44.0	
Effective Green, g (s)	7.0	18.2		9.8	21.0		11.5	49.8		6.2	44.5	
Actuated g/C Ratio	0.07	0.18		0.10	0.21		0.12	0.50		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	615		173	739		204	1742		110	1552	
v/s Ratio Prot	c0.06	0.12		0.06	c0.15		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.65		0.64	0.73		0.65	0.46		0.47	0.67	
Uniform Delay, d1	46.1	38.0		43.4	36.9		42.3	16.4		45.3	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.5		7.9	3.7		6.9	0.9		3.2	2.3	
Delay (s)	90.2	40.4		51.3	40.6		49.2	17.2		48.5	24.2	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		50.0			42.4			21.7			25.3	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	32.0	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	68.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3441		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3441		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	288	66	83	404	324	66	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	303	69	87	425	341	69	395	45	101	151	9
RTOR Reduction (vph)	0	17	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	355	0	87	425	129	69	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1136		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.10		c0.05	c0.12		0.04	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.31		0.67	0.32	0.22	0.15	0.93			0.78	
Uniform Delay, d1	48.1	25.0		45.2	22.1	21.1	28.9	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.7		11.9	0.6	0.8	0.1	25.3			11.1	
Delay (s)	60.4	25.7		57.1	22.7	21.9	29.0	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.0			25.9			57.3			50.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	37.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3461		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3461		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	62	57	770	191	129	324	40	153	250	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	65	60	811	201	136	341	42	161	263	11
RTOR Reduction (vph)	0	11	0	0	0	106	0	0	32	0	2	0
Lane Group Flow (vph)	29	428	0	60	811	95	136	341	10	161	272	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.5		7.1	47.1	47.1	12.0	25.4	25.4	8.5	21.9	
Effective Green, g (s)	4.0	44.5		6.6	47.1	47.1	11.5	24.9	24.9	8.0	21.4	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.21	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1540		117	1667	746	204	464	394	142	396	
v/s Ratio Prot	0.02	0.12		c0.03	c0.23		0.08	c0.18		c0.09	0.15	
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.13	0.67	0.73	0.03	1.13	0.69	
Uniform Delay, d1	46.8	17.6		45.1	18.2	14.9	42.4	34.5	28.4	46.0	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.85	
Incremental Delay, d2	2.8	0.4		2.8	1.0	0.4	7.2	5.6	0.0	113.2	4.2	
Delay (s)	49.6	18.0		48.0	19.2	15.2	49.6	40.1	28.4	159.9	34.9	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		20.0			20.0			41.7			81.2	
Approach LOS		B			C			D			F	

Intersection Summary				
HCM Average Control Delay	35.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	505	16	90	994	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	532	17	95	1046	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1072			548			1308	1854	274	1652	1849	536
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1072			548			1308	1854	274	1652	1849	536
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			91			73	78	89	95	95	100
cM capacity (veh/h)	646			1017			101	64	723	44	64	489

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	354	194	95	698	374	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	646	1700	1700	1017	1700	1700	91	394	63
Volume to Capacity	0.04	0.21	0.11	0.09	0.41	0.22	0.38	0.22	0.10
Queue Length 95th (ft)	3	0	0	8	0	0	38	20	8
Control Delay (s)	10.8	0.0	0.0	8.9	0.0	0.0	67.1	16.6	68.0
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			31.1		68.0
Approach LOS							D		F

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	45.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3459		1770	3505			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3459		1770	3505			1810	1583		1408	
Volume (vph)	3	485	86	122	796	54	244	178	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	511	91	128	838	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	590	0	128	891	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.2		11.0	49.3			26.5	26.5		8.8	
Effective Green, g (s)	0.4	39.2		10.5	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.39		0.10	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1356		186	1728			471	412		117	
v/s Ratio Prot	0.00	c0.17		c0.07	c0.25			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.43		0.69	0.52			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.3		43.2	17.2			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.98	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.0		5.3	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.3		47.6	10.9			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.6			15.5			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	28.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3367		1770	3388		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3367		1770	3388		3433	3535		1770	3509	
Volume (vph)	98	353	169	32	565	225	340	961	8	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	372	178	34	595	237	358	1012	8	175	1072	64
RTOR Reduction (vph)	0	59	0	0	39	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	491	0	34	793	0	358	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	28.7		9.5	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	27.7		8.5	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.28		0.08	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	933		150	955		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.23		0.10	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.53		0.23	0.83		0.74	0.82		0.78	0.95	
Uniform Delay, d1	44.9	30.6		42.7	33.7		41.3	29.5		42.4	32.3	
Progression Factor	1.49	1.45		1.13	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.6	0.4		0.3	5.5		5.4	6.1		15.3	17.2	
Delay (s)	80.6	44.7		48.6	41.1		46.7	35.6		57.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		50.4			41.4			38.5			50.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	44.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3505		1770	3498			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3505		1770	3498			3169			2905	
Volume (vph)	58	447	30	111	720	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	471	32	117	758	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	494	0	117	811	0	0	195	0	0	367	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1724		166	1882			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.23							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.43			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	6.9			18.2			19.5	
Progression Factor	0.78	1.25		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.9	0.4		10.6	0.7			0.4			5.2	
Delay (s)	37.2	9.8		32.5	7.7			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.7			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	1.00			0.94			0.95			0.89	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	1854			1738			1728			1645	
Flt Permitted	0.44	1.00			0.98			0.89			0.94	
Satd. Flow (perm)	819	1854			1714			1561			1565	
Volume (vph)	417	58	2	8	83	84	2	1	2	49	4	222
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	439	61	2	8	87	88	2	1	2	52	4	234
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	178	0
Lane Group Flow (vph)	439	62	0	0	120	0	0	3	0	0	112	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.4	20.4			6.5			9.0			9.0	
Effective Green, g (s)	20.4	20.4			6.5			9.0			9.0	
Actuated g/C Ratio	0.55	0.55			0.17			0.24			0.24	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	698	1011			298			376			377	
v/s Ratio Prot	c0.17	0.03										
v/s Ratio Perm	c0.18				0.07			0.00			c0.07	
v/c Ratio	0.63	0.06			0.40			0.01			0.30	
Uniform Delay, d1	5.9	4.0			13.7			10.8			11.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	1.8	0.0			0.9			0.0			0.4	
Delay (s)	7.6	4.0			14.6			10.8			12.1	
Level of Service	A	A			B			B			B	
Approach Delay (s)		7.2			14.6			10.8			12.1	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3509			3493	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3509			3493	
Volume (vph)	77	193	12	112	289	20	0	1206	72	0	1119	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1269	76	0	1178	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1341	0	0	1283	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2045			2036	
v/s Ratio Prot					c0.13			c0.38			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.66			0.63	
Uniform Delay, d1		44.0			41.9			14.8			14.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.7			1.5	
Delay (s)		57.5			47.6			16.4			15.9	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.4			15.9	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3253			5077	
Volume (vph)	0	0	0	65	656	814	12	614	0	0	1165	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	646	0	0	1226	13
RTOR Reduction (vph)	0	0	0	0	0	149	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	708	0	659	0	0	1238	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1789			2792	
v/s Ratio Prot					0.22						c0.24	
v/s Ratio Perm						c0.45		0.20				
v/c Ratio					0.58	1.21		0.37			0.44	
Uniform Delay, d1					25.3	31.5		12.7			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	109.2		0.6			0.5	
Delay (s)					25.7	140.7		13.3			13.9	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			86.7			13.3			13.9	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	47.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3496		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3496		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	608	54	532	666	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	640	57	560	701	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	690	0	560	701	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1513		638	2391	
v/s Ratio Prot		c0.15						c0.20		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.46		0.88	0.29	
Uniform Delay, d1		25.6						14.0		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.0		12.6	0.0	
Delay (s)		28.2						15.0		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.0			20.5	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3430		1770	3498		1770	3424		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3430		1770	3498		1770	3424		1770	1863	1583
Volume (vph)	300	794	205	148	903	76	199	503	140	151	376	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	216	156	951	80	209	529	147	159	396	533
RTOR Reduction (vph)	0	21	0	0	6	0	0	23	0	0	0	296
Lane Group Flow (vph)	316	1031	0	156	1025	0	209	653	0	159	396	237
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	38.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1222		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.12	c0.19		0.09	c0.21	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.84		0.76	1.05		0.65	1.05		0.45	1.06	0.75
Uniform Delay, d1	43.5	32.6		47.1	39.6		41.7	45.0		38.7	44.0	41.4
Progression Factor	1.00	1.00		1.19	0.92		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.2		1.5	25.7		3.2	45.8		0.9	63.9	9.3
Delay (s)	72.8	39.8		57.3	62.2		44.6	90.9		39.6	107.9	50.7
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.4			61.6			80.0			69.9	
Approach LOS		D			E			E			E	

Intersection Summary				
HCM Average Control Delay	62.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3439		1770	3490		1770	3457	
Flt Permitted	0.17	1.00			0.63		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	307	3382			2174		1770	3490		1770	3457	
Volume (vph)	202	684	288	80	702	149	279	1227	125	191	1106	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	84	739	157	294	1292	132	201	1164	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	7	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	966	0	294	1417	0	201	1364	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	134	1476			949		274	1110		241	1037	
v/s Ratio Prot		0.29					0.17	c0.41		0.11	c0.39	
v/s Ratio Perm	c0.69				0.44							
v/c Ratio	1.59	0.66			1.02		1.07	1.28		0.83	1.32	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.09	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	286.6	0.7			33.8		75.1	131.6		21.3	148.7	
Delay (s)	320.2	27.3			64.8		121.6	169.1		67.6	187.2	
Level of Service	F	C			E		F	F		E	F	
Approach Delay (s)		77.8			64.8			161.0			171.9	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM Average Control Delay	128.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	120.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	133	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	140	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	574	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	574	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	87	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	337	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	143	2
Volume Left	1	197	2	1
Volume Right	0	0	140	0
cSH	1599	1596	1029	386
Volume to Capacity	0.00	0.12	0.14	0.01
Queue Length 95th (ft)	0	11	12	0
Control Delay (s)	0.4	7.0	9.1	14.4
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	7.0	9.1	14.4
Approach LOS			A	B

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 No Project PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	93	79	6	137	106	501	10	404	209	93	293	110	361	21	37	356	388	43

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	178	744	623	496	382	393	431
Delay	51.5	9.7	50.0	33.3	2.1	114.0	235.4
LOS	D	A	D	C	A	F	F

HCM Average Control Delay	**95.8**
HCM Level of Service	**F**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1632			1860	1583	1770	1786	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1632			1837	1583	1770	1786	
Volume (vph)	93	79	6	137	106	501	10	404	209	93	293	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	83	6	144	112	527	11	425	220	98	308	116
RTOR Reduction (vph)	0	2	0	0	127	0	0	0	158	0	10	0
Lane Group Flow (vph)	98	87	0	144	512	0	0	436	62	98	414	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	11.1	11.1		46.2	46.2			30.2	30.2	10.5	44.7	
Effective Green, g (s)	11.1	11.1		46.2	46.2			30.2	30.2	10.5	44.7	
Actuated g/C Ratio	0.10	0.10		0.41	0.41			0.26	0.26	0.09	0.39	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	172	180		717	661			487	419	163	700	
v/s Ratio Prot	c0.06	0.05		0.08	c0.31					0.06	c0.23	
v/s Ratio Perm								c0.24	0.04			
v/c Ratio	0.57	0.48		0.20	0.77			0.90	0.15	0.60	0.59	
Uniform Delay, d1	49.2	48.7		21.9	29.4			40.4	32.1	49.7	27.4	
Progression Factor	1.00	1.00		0.30	0.34			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	1.5		0.0	0.5			18.6	0.1	4.2	1.1	
Delay (s)	52.7	50.2		6.7	10.4			59.0	32.2	54.0	28.5	
Level of Service	D	D		A	B			E	C	D	C	
Approach Delay (s)		51.5			9.7			50.0			33.3	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	31.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1849		1770	1863	1759	
Flt Permitted	1.00		0.19	1.00	0.96	
Satd. Flow (perm)	1849		353	1863	1759	
Volume (vph)	361	21	37	356	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	380	22	39	375	408	45
RTOR Reduction (vph)	2	0	0	0	3	0
Lane Group Flow (vph)	400	0	39	375	450	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	84.9		21.1	21.1	21.1	
Effective Green, g (s)	84.9		21.1	21.1	21.1	
Actuated g/C Ratio	0.74		0.19	0.19	0.19	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1377		65	345	326	
v/s Ratio Prot	c0.22			c0.20	c0.26	
v/s Ratio Perm			0.11			
v/c Ratio	0.29		0.60	1.09	1.38	
Uniform Delay, d1	4.7		42.6	46.5	46.5	
Progression Factor	0.43		1.00	1.00	1.00	
Incremental Delay, d2	0.1		11.8	73.7	188.9	
Delay (s)	2.1		54.4	120.2	235.4	
Level of Service	A		D	F	F	
Approach Delay (s)	2.1			114.0	235.4	
Approach LOS	A			F	F	

Intersection Summary				
HCM Average Control Delay	121.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1006: 65th St & Hollis St — 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1769			1799		1770	1843		1770	1760	
Flt Permitted		0.81			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1464			1566		1770	1843		1770	1760	
Volume (vph)	175	199	68	36	101	20	163	712	44	19	404	173
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	209	72	38	106	21	172	749	46	20	425	182
RTOR Reduction (vph)	0	12	0	0	9	0	0	3	0	0	28	0
Lane Group Flow (vph)	0	453	0	0	156	0	172	792	0	20	579	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		426			456		222	875		29	643	
v/s Ratio Prot							c0.10	c0.43		0.01	0.33	
v/s Ratio Perm		c0.31			0.10							
v/c Ratio		1.06			0.34		0.77	0.90		0.69	0.90	
Uniform Delay, d1		19.5			15.4		23.3	13.3		26.9	16.5	
Progression Factor		1.00			1.00		0.91	1.07		0.98	1.11	
Incremental Delay, d2		61.4			0.3		13.4	13.3		39.1	14.9	
Delay (s)		80.9			15.7		34.7	27.5		65.5	33.2	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		80.9			15.7			28.8			34.3	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	40.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1007: 64th St & Christie Ave — 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	137	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	144	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	233	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.13	0.04
Departure Headway (s)	4.7	5.2	4.6	4.8
Degree Utilization, x	0.11	0.19	0.30	0.26
Capacity (veh/h)	679	631	746	709
Control Delay (s)	8.3	9.4	9.5	9.5
Approach Delay (s)	8.3	9.4	9.5	9.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.3		
HCM Level of Service	A		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	47	32	16	566	350	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	49	34	17	596	368	94
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	1045	415	462			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1045	415	462			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	95	98			
cM capacity (veh/h)	250	637	1099			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	83	17	596	462
Volume Left	49	17	0	0
Volume Right	34	0	0	94
cSH	331	1099	1700	1700
Volume to Capacity	0.25	0.02	0.35	0.27
Queue Length 95th (ft)	24	1	0	0
Control Delay (s)	19.5	8.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.5	0.2		0.0
Approach LOS	C			

Intersection Summary				
Average Delay			1.5	
Intersection Capacity Utilization			41.0%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1649		1770	3539	1452		3446	
Flt Permitted		0.97	1.00	0.95	0.97		0.40	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1649		746	3539	1452		3201	
Volume (vph)	12	5	95	572	63	53	130	323	117	22	363	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	602	66	56	137	340	123	23	382	71
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	76	0	13	0
Lane Group Flow (vph)	0	18	6	372	346	0	137	340	47	0	463	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	741		286	1358	557		1228	
v/s Ratio Prot		c0.01		c0.22	0.21			0.10				
v/s Ratio Perm			0.00				c0.18		0.03		0.14	
v/c Ratio		0.17	0.06	0.49	0.47		0.48	0.25	0.08		0.38	
Uniform Delay, d1		49.3	49.0	21.4	21.1		25.6	23.1	21.6		24.4	
Progression Factor		1.00	1.00	0.21	0.18		0.92	0.85	1.16		1.00	
Incremental Delay, d2		0.6	0.2	2.1	1.9		4.7	0.4	0.2		0.9	
Delay (s)		49.8	49.2	6.6	5.7		28.1	20.1	25.3		25.3	
Level of Service		D	D	A	A		C	C	C		C	
Approach Delay (s)		49.3			6.1			23.0			25.3	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay		18.8	HCM Level of Service	B
HCM Volume to Capacity ratio		0.47		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		62.9%	ICU Level of Service	B
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	103	34	474	640	258	213
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	36	499	674	272	224
RTOR Reduction (vph)	0	23	0	0	0	110
Lane Group Flow (vph)	108	13	499	674	272	114
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	12.9	41.4	25.0	90.1	61.6	12.9
Effective Green, g (s)	12.4	40.9	24.5	89.6	61.1	12.4
Actuated g/C Ratio	0.11	0.37	0.22	0.81	0.56	0.11
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	200	589	765	1517	1035	178
v/s Ratio Prot	0.06	0.01	c0.15	c0.36	0.15	c0.07
v/s Ratio Perm						
v/c Ratio	0.54	0.02	0.65	0.44	0.26	0.64
Uniform Delay, d1	46.1	21.9	38.9	3.0	12.7	46.7
Progression Factor	0.60	0.23	1.17	0.08	1.00	1.00
Incremental Delay, d2	2.9	0.0	1.7	0.8	0.6	7.6
Delay (s)	30.6	5.1	47.3	1.0	13.3	54.3
Level of Service	C	A	D	A	B	D
Approach Delay (s)	24.2			20.7	31.8	
Approach LOS	C			C	C	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	555	14	0	11	719	1285	269	586	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	584	15	0	12	757	1353	283	617	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	292	307	0	12	757	1353	283	664	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	19.8	19.8		1.2	24.0	93.0	17.4	40.2	
Effective Green, g (s)	15.8	15.8	15.8	19.8	19.8		0.7	24.5	93.0	16.9	40.7	
Actuated g/C Ratio	0.17	0.17	0.17	0.21	0.21		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	301	317	269	358	360		13	932	1583	322	800	
v/s Ratio Prot	0.10	c0.21		0.17	0.18		0.01	0.21		0.16	0.36	
v/s Ratio Perm			0.03						c0.85			
v/c Ratio	0.60	1.23	0.17	0.82	0.85		0.92	0.81	0.85	0.88	0.83	
Uniform Delay, d1	35.7	38.6	33.0	34.9	35.2		46.1	32.1	0.0	37.1	23.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.3	126.9	0.1	13.0	17.2		205.3	5.3	6.1	22.1	7.0	
Delay (s)	38.0	165.5	33.1	47.9	52.4		251.4	37.4	6.1	59.2	30.1	
Level of Service	D	F	C	D	D		F	D	A	E	C	
Approach Delay (s)		115.9			50.2			18.7			38.8	
Approach LOS		F			D			B			D	

Intersection Summary				
HCM Average Control Delay	41.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	86.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2984	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2984	1399				3433		1583
Volume (vph)	142	429	603	0	569	1772	0	0	0	900	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	1865	0	0	0	947	0	361
RTOR Reduction (vph)	0	218	0	0	177	0	0	0	0	0	0	215
Lane Group Flow (vph)	149	869	0	0	1089	1198	0	0	0	947	0	146
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	68.4			44.4	110.0				33.1		33.1
Effective Green, g (s)	20.0	68.4			44.4	110.0				33.6		33.6
Actuated g/C Ratio	0.18	0.62			0.40	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2008			1204	1399				1049		484
v/s Ratio Prot	0.08	0.27			0.36							0.09
v/s Ratio Perm						c0.86				0.28		
v/c Ratio	0.46	0.43			0.90	0.86				0.90		0.30
Uniform Delay, d1	40.2	10.8			30.8	0.0				36.6		29.2
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			3.2	1.8				10.7		0.3
Delay (s)	40.6	11.4			23.8	1.8				47.4		29.5
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.0			13.1			0.0			42.4	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	21.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1514	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1514	659			
Volume (vph)	153	1175	0	0	1739	442	603	226	1120	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1175	0	0	1739	442	603	226	1120	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	277	0	81	12	0	0	0
Lane Group Flow (vph)	153	1175	0	0	1739	165	603	705	548	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	509	335			
v/s Ratio Prot	0.09	c0.33			c0.37		0.36	0.47	c0.83			
v/s Ratio Perm						0.12						
v/c Ratio	0.45	0.79			1.03	0.34	1.07	1.39	1.64			
Uniform Delay, d1	39.4	27.8			35.0	25.4	36.5	36.5	27.0			
Progression Factor	1.53	0.40			0.94	1.80	1.00	1.00	1.00			
Incremental Delay, d2	2.9	2.9			23.1	0.8	57.1	185.2	299.6			
Delay (s)	63.3	13.9			56.1	46.5	93.6	221.7	326.6			
Level of Service	E	B			E	D	F	F	F			
Approach Delay (s)		19.6			54.1			212.2			0.0	
Approach LOS		B			D			F			A	

Intersection Summary				
HCM Average Control Delay	102.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.38			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.1%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1811	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1811	2628
Volume (vph)	359	1191	745	325	1274	223	132	16	66	213	163	667
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	359	1191	745	325	1274	223	132	16	66	213	163	667
RTOR Reduction (vph)	0	0	143	0	0	24	0	0	58	0	0	92
Lane Group Flow (vph)	359	1191	602	325	1274	199	72	76	8	0	376	575
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	0.10	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.21	0.22
v/s Ratio Perm						0.13			0.01			
v/c Ratio	0.68	1.17	1.07	1.19	1.20	0.42	0.34	0.35	0.04		0.76	0.51
Uniform Delay, d1	43.9	38.5	29.5	46.5	38.5	30.8	43.8	43.8	42.1		36.7	23.1
Progression Factor	1.22	1.00	1.04	1.07	1.08	1.14	1.02	1.02	2.08		0.94	0.80
Incremental Delay, d2	0.6	78.1	33.8	108.2	96.9	2.0	0.7	0.7	0.1		9.7	1.5
Delay (s)	54.0	116.6	64.5	158.0	138.4	37.3	45.5	45.6	87.7		44.3	19.9
Level of Service	D	F	E	F	F	D	D	D	F		D	B
Approach Delay (s)		89.9			129.5			58.5			28.7	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	90.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	788	0	0	0	0	1105	25	0	286	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1163	26	0	301	0
RTOR Reduction (vph)	0	0	206	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	623	0	0	0	0	1188	0	0	301	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.22					c0.34			0.16	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.37					0.57			0.49	
Uniform Delay, d1	25.4	25.4	11.3					14.2			29.7	
Progression Factor	1.23	1.20	1.80					1.00			1.39	
Incremental Delay, d2	0.7	0.3	0.1					1.2			2.8	
Delay (s)	31.9	30.9	20.6					15.4			44.0	
Level of Service	C	C	C					B			D	
Approach Delay (s)		23.3			0.0			15.4			44.0	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	22.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3372		1770	3479		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3372		1770	3479		1770	1849		1770	1863	1540
Volume (vph)	206	832	261	23	738	59	523	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	876	275	24	777	62	551	633	28	73	314	158
RTOR Reduction (vph)	0	26	0	0	6	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1125	0	24	833	0	551	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	907		55	727		624	652		357	376	311
v/s Ratio Prot	0.12	c0.33		0.01	c0.24		0.31	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.24		0.44	1.15		0.88	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		33.5	35.6		36.5	42.1	35.8
Progression Factor	1.27	1.04		1.00	1.00		1.08	1.07		1.23	1.18	2.42
Incremental Delay, d2	187.1	116.1		5.5	81.6		13.0	36.8		0.2	13.0	0.1
Delay (s)	250.4	157.7		57.8	125.1		49.2	75.0		45.2	62.8	86.6
Level of Service	F	F		E	F		D	E		D	E	F
Approach Delay (s)		172.4			123.2			63.3			67.4	
Approach LOS		F			F			E			E	

Intersection Summary				
HCM Average Control Delay	114.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3483		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3428		1770	3483		1770	3494		1770	3481	
Volume (vph)	181	717	189	106	510	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	755	199	112	537	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	26	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	928	0	112	591	0	195	1585	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.3		8.4	22.7		13.1	31.4		9.9	28.2	
Effective Green, g (s)	10.0	25.8		7.4	23.2		12.1	31.9		8.9	28.7	
Actuated g/C Ratio	0.11	0.29		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	983		146	898		238	1238		175	1110	
v/s Ratio Prot	c0.11	c0.27		0.06	0.17		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.94		0.77	0.66		0.82	1.28		0.67	1.31	
Uniform Delay, d1	39.8	31.4		40.5	29.9		37.9	29.0		39.2	30.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	16.8		21.1	1.8		19.3	132.4		9.8	144.4	
Delay (s)	94.5	48.2		61.6	31.6		57.2	161.5		49.0	175.0	
Level of Service	F	D		E	C		E	F		D	F	
Approach Delay (s)		55.9			36.3			150.1			165.6	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	118.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	94.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1018: 40th St & Horton St — 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3406		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3406		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	705	194	158	752	107	224	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	742	204	166	792	113	236	362	178	273	418	20
RTOR Reduction (vph)	0	25	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	921	0	166	792	29	236	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	783		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.27		c0.09	c0.22		0.13	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.18		1.34	0.86	0.07	0.49	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.2	27.8	30.7	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	92.7		196.8	10.1	0.4	0.6	73.9			212.2	
Delay (s)	50.8	131.2		243.3	45.3	28.2	31.3	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		128.4			74.2			86.3			248.7	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	126.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	112.9%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1019: 40th St & Hollis St — 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3461		1770	3539	1494	1770	1863	1520	1770	1833	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3461		1770	3539	1494	1770	1863	1520	1770	1833	
Volume (vph)	46	928	127	143	794	224	211	388	133	297	579	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	134	151	836	236	222	408	140	313	609	54
RTOR Reduction (vph)	0	10	0	0	0	146	0	0	99	0	3	0
Lane Group Flow (vph)	48	1101	0	151	836	90	222	408	41	313	660	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.5	29.5	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1090		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.18	c0.36	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	1.01		0.74	0.62	0.16	1.05	0.76	0.09	1.48	1.24	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.3	44.0	32.3	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	6.8	29.7		12.8	2.1	0.6	74.8	5.7	0.1	228.0	117.2	
Delay (s)	53.4	63.9		55.6	27.1	20.9	118.8	38.0	26.0	269.9	151.1	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		63.5			29.4			59.1			189.2	
Approach LOS		E			C			E			F	

Intersection Summary				
HCM Average Control Delay	82.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	96.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1020: 40th St & Harlan St — 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1282	44	96	1179	13	33	12	98	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1349	46	101	1241	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1255			1396			2255	2876	698	2281	2892	627
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1255			1396			2255	2876	698	2281	2892	627
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			79			0	0	73	0	29	98
cM capacity (veh/h)	550			486			8	12	383	0	12	426

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	900	496	101	827	427	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	550	1700	1700	486	1700	1700	8	139	0
Volume to Capacity	0.04	0.53	0.29	0.21	0.49	0.25	4.90	0.79	Err
Queue Length 95th (ft)	3	0	0	19	0	0	Err	120	Err
Control Delay (s)	11.8	0.0	0.0	14.3	0.0	0.0	Err	89.6	Err
Lane LOS	B			B			F	F	F
Approach Delay (s)	0.2			1.1			2792.2		Err
Approach LOS							F		F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	60.7%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1021: 40th St & Emery St — 2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3420		1770	3494			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3420		1770	3494			1814	1555		1814	
Volume (vph)	32	1175	216	158	1013	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1237	227	166	1066	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	14	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1450	0	166	1126	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1094		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.42		0.09	c0.32			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.33		0.78	0.90			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	30.4			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.60			1.00	1.00		1.00	
Incremental Delay, d2	0.6	153.0		1.7	1.1			101.1	0.6		10.7	
Delay (s)	43.6	187.0		52.1	19.3			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		183.8			23.5			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary				
HCM Average Control Delay	104.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.14			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	104.4%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3312		1770	3390		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3312		1770	3390		3433	3532		1770	3482	
Volume (vph)	223	849	422	47	593	187	527	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	894	444	49	624	197	555	1415	16	298	1511	123
RTOR Reduction (vph)	0	60	0	0	30	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1278	0	49	791	0	555	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		5.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	957		81	644		446	1286		250	1306	
v/s Ratio Prot	c0.13	c0.39		0.03	0.23		0.16	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.34		0.60	1.23		1.24	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.61	0.92		0.97	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	151.7		7.5	114.7		127.7	61.8		118.9	117.4	
Delay (s)	30.6	184.3		53.1	153.7		171.2	93.6		161.8	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		161.4			148.1			115.3			150.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	141.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3460			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3460			3110			2395	
Volume (vph)	47	984	17	45	661	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1036	18	47	696	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	19	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1052	0	47	781	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1792			603			465	
v/s Ratio Prot	c0.03	c0.30		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.57		0.58	0.44			0.62			0.82	
Uniform Delay, d1	23.3	8.2		23.4	7.5			18.4			19.3	
Progression Factor	1.04	1.40		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.8			1.9			11.2	
Delay (s)	24.7	11.6		30.0	8.3			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.2			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.94			0.96			0.91	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1770	1833			1734			1768			1670	
Flt Permitted	0.28	1.00			0.87			0.90			0.88	
Satd. Flow (perm)	518	1833			1537			1606			1485	
Volume (vph)	525	95	11	86	105	140	19	83	50	167	59	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	553	100	12	91	111	147	20	87	53	176	62	533
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	90	0
Lane Group Flow (vph)	553	107	0	0	320	0	0	140	0	0	681	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			732			677	
v/s Ratio Prot	c0.24	0.06										
v/s Ratio Perm	c0.25				0.21			0.09			c0.46	
v/c Ratio	1.08	0.13			1.10			0.19			1.01	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	61.6	0.1			83.2			0.1			36.1	
Delay (s)	82.9	14.2			119.7			14.7			60.6	
Level of Service	F	B			F			B			E	
Approach Delay (s)		71.3			119.7			14.7			60.6	
Approach LOS		E			F			B			E	

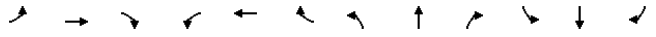
Intersection Summary			
HCM Average Control Delay	71.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	113.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
2030 PM

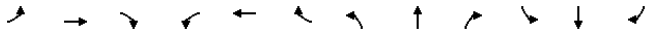
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00			0.97	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1760			1801	1583		1787			1805	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.97	
Satd. Flow (perm)	1770	1760			1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	748	0	0	574	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	17.6	17.6			8.5	8.5		31.5			31.5	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary			
HCM Average Control Delay	86.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3510			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3510			3509	
Volume (vph)	121	332	32	122	216	36	0	1607	92	0	1800	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1692	97	0	1895	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1785	0	0	2007	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1972			1972	
v/s Ratio Prot					c0.11			0.51			c0.57	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.91			1.02	
Uniform Delay, d1		43.5			42.5			20.5			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			7.4			24.8	
Delay (s)		120.0			47.1			27.9			47.8	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			27.9			47.8	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	48.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2551			5077	
Volume (vph)	0	0	0	64	561	803	49	1097	0	0	1819	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	591	845	52	1155	0	0	1915	22
RTOR Reduction (vph)	0	0	0	0	0	62	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	783	0	1207	0	0	1936	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1559			3103	
v/s Ratio Prot					0.19						0.38	
v/s Ratio Perm						c0.49		c0.47				
v/c Ratio					0.62	1.65		0.77			0.62	
Uniform Delay, d1					27.1	31.5		12.9			11.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	300.8		3.8			1.0	
Delay (s)					27.9	332.3		16.7			12.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			199.1			16.7			12.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	73.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3503		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3503		3433	3539	
Volume (vph)	28	861	78	0	0	0	0	1064	78	927	992	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1120	82	976	1044	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1197	0	976	1044	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						38.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.35		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2381	
v/s Ratio Prot		c0.29						c0.34		c0.28	0.29	
v/s Ratio Perm												
v/c Ratio		1.14						0.96		1.01	0.44	
Uniform Delay, d1		41.0						34.8		39.5	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						18.2		31.2	0.0	
Delay (s)		116.5						53.0		70.7	8.4	
Level of Service		F						D		E	A	
Approach Delay (s)		116.5			0.0			53.0			38.5	
Approach LOS		F			A			D			D	

Intersection Summary				
HCM Average Control Delay	61.3	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	130	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	141	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	476	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	476	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	87	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	400	531	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	145	12
Volume Left	0	153	0	1
Volume Right	0	1	141	3
cSH	1604	1605	1043	594
Volume to Capacity	0.00	0.10	0.14	0.02
Queue Length 95th (ft)	0	8	12	2
Control Delay (s)	0.0	6.9	9.0	11.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.0	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 No Project Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	65	46	13	115	67	256	13	405	211	90	441	75	318	29	43	213	225	16

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	124	438	629	606	347	256	241
Delay	47.4	1.7	42.0	32.1	2.1	52.4	61.8
LOS	D	A	D	C	A	D	E

HCM Average Control Delay	**43.1**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 No Project SAT
5/7/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1860	1583	1770	1822	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1641			1822	1583	1770	1822	
Volume (vph)	65	46	13	115	67	256	13	405	211	90	441	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	50	14	125	73	278	14	440	229	98	479	82
RTOR Reduction (vph)	0	9	0	0	106	0	0	0	154	0	5	0
Lane Group Flow (vph)	71	55	0	125	245	0	0	454	75	98	556	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	9.3	9.3		40.5	40.5			30.9	30.9	10.0	44.9	
Effective Green, g (s)	9.3	9.3		40.5	40.5			30.9	30.9	10.0	44.9	
Actuated g/C Ratio	0.09	0.09		0.38	0.38			0.29	0.29	0.09	0.42	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	154	157		672	623			528	458	166	767	
v/s Ratio Prot	c0.04	0.03		0.07	c0.15					0.06	c0.31	
v/s Ratio Perm								c0.25	0.05			
v/c Ratio	0.46	0.35		0.19	0.39			0.86	0.16	0.59	0.73	
Uniform Delay, d1	46.3	45.9		22.1	24.1			35.9	28.3	46.4	25.8	
Progression Factor	1.00	1.00		0.17	0.04			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	1.0		0.0	0.1			13.0	0.1	3.7	3.2	
Delay (s)	47.9	46.8		3.8	1.0			48.9	28.4	50.1	29.0	
Level of Service	D	D		A	A			D	C	D	C	
Approach Delay (s)		47.4			1.7			42.0			32.1	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	29.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	106.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 No Project SAT
5/7/2007

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1841		1770	1863	1764	
Flt Permitted	1.00		0.22	1.00	0.96	
Satd. Flow (perm)	1841		414	1863	1764	
Volume (vph)	318	29	43	213	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	346	32	47	232	245	17
RTOR Reduction (vph)	3	0	0	0	2	0
Lane Group Flow (vph)	375	0	47	232	260	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	80.2		18.0	18.0	18.5	
Effective Green, g (s)	80.2		18.0	18.0	18.5	
Actuated g/C Ratio	0.75		0.17	0.17	0.17	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1384		70	314	306	
v/s Ratio Prot	c0.20			c0.12	c0.15	
v/s Ratio Perm			0.11			
v/c Ratio	0.27		0.67	0.74	0.85	
Uniform Delay, d1	4.1		41.6	42.1	42.8	
Progression Factor	0.49		1.00	1.00	1.00	
Incremental Delay, d2	0.1		20.6	8.3	19.1	
Delay (s)	2.1		62.2	50.4	61.8	
Level of Service	A		E	D	E	
Approach Delay (s)	2.1			52.4	61.8	
Approach LOS	A			D	E	

Intersection Summary				
HCM Average Control Delay	34.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	106.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	114	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	124	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	222	133
Volume Left (vph)	0	108	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.11	-0.21	0.04
Departure Headway (s)	4.4	4.8	4.2	4.5
Degree Utilization, x	0.02	0.17	0.26	0.17
Capacity (veh/h)	737	691	821	751
Control Delay (s)	7.5	8.8	8.7	8.5
Approach Delay (s)	7.5	8.8	8.7	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.6	
HCM Level of Service			A	
Intersection Capacity Utilization			34.1%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	54	21	9	618	492	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	23	10	672	535	91
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1272	580	626			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1315	513	566			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	60	95	99			
cM capacity (veh/h)	148	483	867			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	82	10	672	626
Volume Left	59	10	0	0
Volume Right	23	0	0	91
cSH	184	867	1700	1700
Volume to Capacity	0.44	0.01	0.40	0.37
Queue Length 95th (ft)	51	1	0	0
Control Delay (s)	39.3	9.2	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	39.3	0.1		0.0
Approach LOS	E			

Intersection Summary					
Average Delay			2.4		
Intersection Capacity Utilization			43.5%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2030 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1640		1770	3539	1489		3447	
Flt Permitted		0.97	1.00	0.95	0.97		0.39	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1640		727	3539	1489		3185	
Volume (vph)	31	22	136	765	78	72	143	271	244	25	337	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	832	85	78	155	295	265	27	366	68
RTOR Reduction (vph)	0	0	106	0	7	0	0	0	176	0	13	0
Lane Group Flow (vph)	0	58	42	514	474	0	155	295	89	0	448	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	36.4	36.4		37.6	37.6	37.6		37.6	
Effective Green, g (s)		24.5	24.5	36.4	36.4		37.1	37.1	37.1		37.1	
Actuated g/C Ratio		0.22	0.22	0.33	0.33		0.34	0.34	0.34		0.34	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	556	543		245	1194	502		1074	
v/s Ratio Prot		c0.03		c0.31	0.29			0.08				
v/s Ratio Perm			0.03				c0.21		0.06		0.14	
v/c Ratio		0.14	0.12	0.92	0.87		0.63	0.25	0.18		0.42	
Uniform Delay, d1		34.3	34.1	35.5	34.6		30.7	26.4	25.7		28.1	
Progression Factor		1.00	1.00	0.55	0.53		0.59	0.58	0.24		1.00	
Incremental Delay, d2		0.7	0.7	19.1	12.8		10.2	0.4	0.7		1.2	
Delay (s)		35.1	34.8	38.6	31.1		28.3	15.8	6.7		29.3	
Level of Service		D	C	D	C		C	B	A		C	
Approach Delay (s)		34.9			35.0			15.1			29.3	
Approach LOS		C			C			B			C	

Intersection Summary				
HCM Average Control Delay	27.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2030 No Project SAT
12/21/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	208	67	691	841	343	239
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	73	751	914	373	260
RTOR Reduction (vph)	0	39	0	0	0	20
Lane Group Flow (vph)	226	34	751	914	373	240
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	18.7	52.0	29.8	84.3	51.0	73.2
Effective Green, g (s)	18.2	51.5	29.3	83.8	50.5	72.7
Actuated g/C Ratio	0.17	0.47	0.27	0.76	0.46	0.66
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	293	741	914	1419	855	1046
v/s Ratio Prot	c0.13	0.02	c0.22	c0.49	0.20	0.15
v/s Ratio Perm						
v/c Ratio	0.77	0.05	0.82	0.64	0.44	0.23
Uniform Delay, d1	43.9	15.9	37.9	6.1	20.1	7.5
Progression Factor	0.76	0.59	0.53	2.11	1.00	1.00
Incremental Delay, d2	11.3	0.0	3.3	1.2	1.6	0.1
Delay (s)	44.6	9.3	23.6	14.1	21.7	7.6
Level of Service	D	A	C	B	C	A
Approach Delay (s)	36.0			18.4	15.9	
Approach LOS	D			B	B	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

2030 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1837	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1837	
Volume (vph)	26	21	7	780	13	16	41	325	1041	135	466	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	848	14	17	45	353	1132	147	507	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	446	432	0	45	353	1132	147	539	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	660	
v/s Ratio Prot	0.02	0.01		0.27	0.26		0.03	0.10		0.08	c0.29	
v/s Ratio Perm			0.00						c0.71			
v/c Ratio	0.38	0.30	0.01	0.78	0.76		0.53	0.34	0.72	0.75	0.82	
Uniform Delay, d1	35.2	35.1	34.7	22.4	22.1		35.1	20.7	0.0	32.6	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	6.6	5.4		2.7	0.1	2.8	13.6	7.6	
Delay (s)	36.4	35.9	34.7	29.0	27.5		37.8	20.8	2.8	46.2	29.5	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			28.3			8.0			33.0	
Approach LOS		D			C			A			C	

Intersection Summary				
HCM Average Control Delay	19.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

2030 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.97	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.94	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			3068	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			3068	1399				3433		1583
Volume (vph)	115	309	31	0	418	1303	0	0	0	1006	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1416	0	0	0	1093	0	282
RTOR Reduction (vph)	0	6	0	0	81	0	0	0	0	0	0	167
Lane Group Flow (vph)	125	364	0	0	697	1092	0	0	0	1093	0	115
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	62.0			46.6	110.0				39.5		39.5
Effective Green, g (s)	11.4	62.0			46.6	110.0				40.0		40.0
Actuated g/C Ratio	0.10	0.56			0.42	1.00				0.36		0.36
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1967			1300	1399				1248		576
v/s Ratio Prot	0.07	0.10			0.23							0.07
v/s Ratio Perm						c0.78				c0.32		
v/c Ratio	0.68	0.19			0.54	0.78				0.88		0.20
Uniform Delay, d1	47.6	11.7			23.6	0.0				32.7		24.0
Progression Factor	1.00	1.00			0.83	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			0.9	2.6				7.1		0.1
Delay (s)	55.7	11.9			20.5	2.6				39.8		24.1
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.0			10.0			0.0			36.6	
Approach LOS		C			B			A			D	

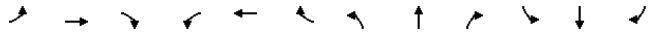
Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	123	1191	0	0	1294	445	427	21	1316	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1295	0	0	1407	484	464	23	1430	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	312	0	162	2	0	0	0
Lane Group Flow (vph)	134	1295	0	0	1407	172	464	576	713	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.36			0.30		0.28	0.40	c1.08			
v/s Ratio Perm						0.12						
v/c Ratio	0.77	1.08			0.85	0.33	0.63	0.91	1.83			
Uniform Delay, d1	48.4	36.5			32.7	25.8	24.1	29.0	22.5			
Progression Factor	1.19	0.61			1.12	2.48	1.00	1.00	1.00			
Incremental Delay, d2	14.6	49.2			4.0	1.2	4.1	19.6	384.7			
Delay (s)	72.2	71.4			40.6	65.3	28.2	48.6	407.2			
Level of Service	E	E			D	E	C	D	F			
Approach Delay (s)		71.5			46.9			177.4			0.0	
Approach LOS		E			D			F			A	

Intersection Summary			
HCM Average Control Delay	101.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1821	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1821	2628
Volume (vph)	339	946	1230	350	751	205	227	62	101	224	270	755
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	368	1028	1337	380	816	223	247	67	110	243	293	821
RTOR Reduction (vph)	0	50	85	0	0	55	0	0	98	0	0	27
Lane Group Flow (vph)	368	1488	742	380	816	168	153	161	12	0	536	794
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		497	1266
v/s Ratio Prot	0.11	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.29	0.30
v/s Ratio Perm						0.11			0.01			
v/c Ratio	0.62	1.48	1.42	1.39	0.77	0.37	0.84	0.86	0.07		1.08	0.63
Uniform Delay, d1	42.2	37.5	31.5	46.5	35.0	30.3	48.0	48.2	44.0		40.0	21.2
Progression Factor	1.15	0.92	0.82	1.00	1.00	1.00	1.26	1.26	2.47		0.77	0.35
Incremental Delay, d2	0.4	214.9	191.6	195.1	5.3	2.3	23.7	26.6	0.1		57.7	1.7
Delay (s)	48.9	249.2	217.4	241.6	40.4	32.6	84.3	87.3	108.7		88.6	9.2
Level of Service	D	F	F	F	D	C	F	F	F		F	A
Approach Delay (s)		212.6			93.0			91.8			40.5	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	136.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1512	21	0	404	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1643	23	0	439	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1665	0	0	439	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.47			0.24	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.89			0.51	
Uniform Delay, d1	21.7	21.7	25.2					23.3			21.1	
Progression Factor	1.03	1.04	1.09					0.57			0.80	
Incremental Delay, d2	0.7	0.3	3.5					5.2			2.1	
Delay (s)	23.0	22.8	31.0					18.4			18.9	
Level of Service	C	C	C					B			B	
Approach Delay (s)		28.8			0.0			18.4			18.9	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	23.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3348		1770	3507		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3348		1770	3507		1770	1839		1770	1863	1549
Volume (vph)	101	671	334	40	727	38	268	288	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	729	363	43	790	41	291	313	24	40	308	107
RTOR Reduction (vph)	0	84	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1008	0	43	826	0	291	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Effective Green, g (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Actuated g/C Ratio	0.06	0.29		0.03	0.27		0.22	0.22		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	106	987		61	944		386	401		375	395	328
v/s Ratio Prot	c0.06	c0.30		0.02	0.24		0.16	c0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.04	1.02		0.70	0.87		0.75	0.83		0.11	0.78	0.07
Uniform Delay, d1	31.2	23.4		31.8	23.2		24.3	24.8		21.1	24.7	21.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	97.9	34.2		30.9	9.1		8.1	13.6		0.1	9.4	0.1
Delay (s)	129.2	57.6		62.6	32.3		32.4	38.4		21.2	34.1	21.0
Level of Service	F	E		E	C		C	D		C	C	C
Approach Delay (s)		64.2			33.8			35.7			29.9	
Approach LOS		E			C			D			C	

Intersection Summary				
HCM Average Control Delay	45.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	75.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

2030 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3418		1770	3520			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3418		1770	3520			1809	1555		1785	
Volume (vph)	19	1205	226	175	1288	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1310	246	190	1400	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	2	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1543	0	190	1433	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1227		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.45		0.11	c0.41			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.26		0.97	0.89			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	24.7			37.8	31.0		39.8	
Progression Factor	0.94	0.72		0.81	0.70			1.00	1.00		1.00	
Incremental Delay, d2	237.7	122.2		12.7	0.8			59.1	0.4		0.6	
Delay (s)	284.1	145.2		48.7	18.0			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		147.0			21.6			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	81.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

2030 No Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3085		1770	3383		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3085		1770	3383		3433	3516		1770	3354	
Volume (vph)	192	768	458	72	656	109	603	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	835	498	78	713	118	655	1205	27	170	1276	228
RTOR Reduction (vph)	0	86	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1247	0	78	818	0	655	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	996		83	805		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.40		0.04	0.24		c0.19	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.25		0.94	1.02		1.19	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.34	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	114.2		77.0	35.8		103.8	25.6		18.3	200.1	
Delay (s)	61.7	123.5		124.5	73.9		145.8	58.1		61.1	234.6	
Level of Service	E	F		F	E		F	E		E	F	
Approach Delay (s)		115.1			78.3			88.5			217.0	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	129.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	113.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
PREFERRED PROJECT ALTERNATIVE
BASE YEAR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3390		1770	3522		1770	3434		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3390		1770	3522		1770	3434		1770	1863	1583
Volume (vph)	500	775	304	102	616	20	86	172	42	59	179	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	330	111	670	22	93	187	46	64	195	202
RTOR Reduction (vph)	0	32	0	0	2	0	0	21	0	0	0	173
Lane Group Flow (vph)	543	1140	0	111	690	0	93	212	0	64	195	29
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	55.1		10.7	31.2		11.4	11.4		15.8	15.8	15.8
Effective Green, g (s)	34.6	56.1		10.7	32.2		11.4	11.4		15.8	15.8	15.8
Actuated g/C Ratio	0.31	0.51		0.10	0.29		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1729		172	1031		183	356		254	268	227
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.05	c0.06		0.04	c0.10	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.66		0.65	0.67		0.51	0.60		0.25	0.73	0.13
Uniform Delay, d1	37.3	19.9		47.8	34.2		46.6	47.1		41.8	45.0	41.1
Progression Factor	1.00	1.00		0.78	1.46		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.0		6.7	2.9		1.6	2.2		0.5	9.5	0.3
Delay (s)	68.8	21.9		44.0	52.9		48.3	49.3		42.4	54.5	41.3
Level of Service	E	C		D	D		D	D		D	D	D
Approach Delay (s)		36.7			51.7			49.0			47.1	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	43.0	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3446		1770	3497		1770	3466	
Flt Permitted	0.20	1.00			0.68		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	368	3458			2355		1770	3497		1770	3466	
Volume (vph)	70	670	121	43	521	103	130	495	42	113	619	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	47	566	112	141	538	46	123	673	108
RTOR Reduction (vph)	0	16	0	0	16	0	0	5	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	709	0	141	579	0	123	772	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.4	34.4			34.4		13.2	46.6		16.0	49.4	
Effective Green, g (s)	34.4	34.4			34.4		13.2	47.6		16.0	50.4	
Actuated g/C Ratio	0.31	0.31			0.31		0.12	0.43		0.15	0.46	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	115	1081			736		212	1513		257	1588	
v/s Ratio Prot		0.24					c0.08	0.17		0.07	c0.22	
v/s Ratio Perm	0.21				c0.30							
v/c Ratio	0.66	0.78			0.96		0.67	0.38		0.48	0.49	
Uniform Delay, d1	32.7	34.4			37.2		46.3	21.2		43.2	20.8	
Progression Factor	0.54	0.59			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.6	2.9			24.2		7.6	0.7		1.4	1.1	
Delay (s)	28.3	23.2			61.4		53.9	22.0		44.6	21.8	
Level of Service	C	C			E		D	C		D	C	
Approach Delay (s)		23.6			61.4			28.2			24.9	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	33.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	69	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	75	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	307	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	307	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	93	100	100	100
cM capacity (veh/h)	1542			1616			693	633	1079	577	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	77	1
Volume Left	0	84	2	0
Volume Right	2	1	75	0
cSH	1542	1616	1062	633
Volume to Capacity	0.00	0.05	0.07	0.00
Queue Length 95th (ft)	0	4	6	0
Control Delay (s)	0.0	4.4	8.7	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.7
Approach LOS			A	B

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	26.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	49	46	5	52	47	36	11	78	59	105	140	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	50	5	57	51	39	12	85	64	114	152	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	53	55	57	90	161	114	250
Volume Left (vph)	53	0	57	0	12	114	0
Volume Right (vph)	0	5	0	39	64	0	98
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.19	0.53	-0.24
Departure Headway (s)	6.6	6.1	6.6	5.8	5.5	6.0	5.2
Degree Utilization, x	0.10	0.09	0.10	0.14	0.25	0.19	0.36
Capacity (veh/h)	502	548	508	578	624	577	667
Control Delay (s)	9.2	8.5	9.1	8.5	10.3	9.2	9.9
Approach Delay (s)	8.8		8.8		10.3	9.7	
Approach LOS	A		A		B	A	

Intersection Summary				
Delay	9.5			
HCM Level of Service	A			
Intersection Capacity Utilization	40.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	210	0	0	135	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	228	0	0	147	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			228		375	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			228		375	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1340		626	811

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	228	147	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1340	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	14.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.99		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1708			1811		1770	1850		1770	1839	
Flt Permitted		0.93			0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1597			1414		1770	1850		1770	1839	
Volume (vph)	43	63	132	37	42	4	36	271	13	23	385	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	68	143	40	46	4	39	295	14	25	418	39
RTOR Reduction (vph)	0	90	0	0	3	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	168	0	0	87	0	39	306	0	25	452	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		319			283		85	1003		32	942	
v/s Ratio Prot							c0.02	0.17		0.01	c0.25	
v/s Ratio Perm		c0.11			0.06							
v/c Ratio		0.53			0.31		0.46	0.31		0.78	0.48	
Uniform Delay, d1		17.9			17.0		23.2	6.3		24.5	7.9	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		1.2			0.4		2.8	0.8		72.6	1.7	
Delay (s)		19.1			17.5		23.6	8.4		97.1	9.6	
Level of Service		B			B		C	A		F	A	
Approach Delay (s)		19.1			17.5			10.1			14.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	14.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	68	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	74	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	134	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.09	0.00
Departure Headway (s)	4.2	4.6	4.1	4.3
Degree Utilization, x	0.01	0.11	0.15	0.11
Capacity (veh/h)	800	741	838	814
Control Delay (s)	7.3	8.2	7.9	7.8
Approach Delay (s)	7.3	8.2	7.9	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.9			
HCM Level of Service	A			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	28	20	18	137	162	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	22	20	149	176	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	384	196	215			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	196	215			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	99			
cM capacity (veh/h)	610	846	1355			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	52	20	149	215
Volume Left	30	20	0	0
Volume Right	22	0	0	39
cSH	690	1355	1700	1700
Volume to Capacity	0.08	0.01	0.09	0.13
Queue Length 95th (ft)	6	1	0	0
Control Delay (s)	10.6	7.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.6	0.9		0.0
Approach LOS	B			

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		25.0%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3406		3539	1583		3530
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3406		3539	1583		3294
Volume (vph)	275	30	286	140	17	294
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	299	33	311	152	18	320
RTOR Reduction (vph)	9	0	0	82	0	0
Lane Group Flow (vph)	323	0	311	70	0	338
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1567		1628	728		1515
v/s Ratio Prot	c0.09		0.09			
v/s Ratio Perm				0.04		c0.10
v/c Ratio	0.21		0.19	0.10		0.22
Uniform Delay, d1	16.1		16.0	15.3		16.2
Progression Factor	0.38		0.17	0.52		1.00
Incremental Delay, d2	0.3		0.2	0.2		0.3
Delay (s)	6.4		3.0	8.1		16.6
Level of Service	A		A	A		B
Approach Delay (s)	6.4		4.7			16.6
Approach LOS	A		A			B

Intersection Summary				
HCM Average Control Delay	8.7	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	35.3%	ICU Level of Service	A	
Analysis Period (min)	15			

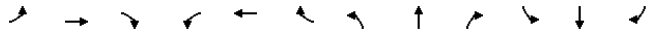
c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	97	15	223	157	71	130
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	16	242	171	77	141
RTOR Reduction (vph)	0	11	0	0	0	126
Lane Group Flow (vph)	105	5	242	171	77	15
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	11.3	29.6	14.8	81.7	63.4	11.3
Effective Green, g (s)	10.8	29.1	14.3	81.2	62.9	10.8
Actuated g/C Ratio	0.11	0.29	0.14	0.81	0.63	0.11
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	461	491	1513	1172	171
v/s Ratio Prot	c0.06	0.00	c0.07	c0.09	0.04	0.01
v/s Ratio Perm						
v/c Ratio	0.55	0.01	0.49	0.11	0.07	0.09
Uniform Delay, d1	42.3	25.2	39.5	1.9	7.2	40.2
Progression Factor	1.02	3.30	1.06	0.11	1.00	1.00
Incremental Delay, d2	3.2	0.0	0.8	0.1	0.1	0.2
Delay (s)	46.4	83.3	42.8	0.4	7.3	40.4
Level of Service	D	F	D	A	A	D
Approach Delay (s)	51.3			25.2	28.7	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	30.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	25.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

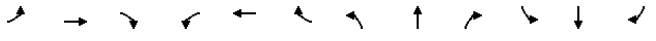
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1706		1770	3539	1583	1770	1795	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1706		1770	3539	1583	1770	1795	
Volume (vph)	5	21	16	542	79	0	88	37	641	60	220	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	589	86	0	96	40	697	65	239	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	23	1	329	346	0	96	40	697	65	305	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.7	2.7	2.7	17.4	17.4		4.4	16.2	55.5	3.7	15.5	
Effective Green, g (s)	2.2	2.2	2.2	17.4	17.4		3.9	16.7	55.5	3.2	16.0	
Actuated g/C Ratio	0.04	0.04	0.04	0.31	0.31		0.07	0.30	1.00	0.06	0.29	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	70	74	63	527	535		124	1065	1583	102	517	
v/s Ratio Prot	0.00	0.01		0.20	c0.20		0.05	0.01		0.04	c0.17	
v/s Ratio Perm			0.00						c0.44			
v/c Ratio	0.07	0.31	0.01	0.62	0.65		0.77	0.04	0.44	0.64	0.59	
Uniform Delay, d1	25.7	25.9	25.6	16.3	16.4		25.4	13.7	0.0	25.6	16.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.0	2.4		23.5	0.0	0.9	9.2	1.4	
Delay (s)	25.8	26.8	25.6	18.3	18.8		48.8	13.7	0.9	34.8	18.4	
Level of Service	C	C	C	B	B		D	B	A	C	B	
Approach Delay (s)		26.2			18.5			7.0			21.2	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	14.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	758	0	0	0	636	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	824	0	0	0	691	0	139
RTOR Reduction (vph)	0	66	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	129	375	0	0	739	824	0	0	0	691	0	33
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	67.9			44.9	100.0				23.6		23.6
Effective Green, g (s)	19.0	67.9			44.9	100.0				24.1		24.1
Actuated g/C Ratio	0.19	0.68			0.45	1.00				0.24		0.24
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2235			1522	1441				827		382
v/s Ratio Prot	0.07	0.11			0.22					c0.20		
v/s Ratio Perm						c0.57						0.02
v/c Ratio	0.38	0.17			0.49	0.57				0.84		0.09
Uniform Delay, d1	35.4	5.8			19.4	0.0				36.1		29.4
Progression Factor	1.00	1.00			0.84	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.1				7.2		0.1
Delay (s)	35.7	6.0			17.0	1.1				43.3		29.5
Level of Service	D	A			B	A				D		C
Approach Delay (s)		12.7			8.6			0.0			41.0	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1474	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1474	1504			
Volume (vph)	74	779	0	0	849	293	589	2	1052	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	847	0	0	923	318	640	2	1143	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	216	0	103	55	0	0	0
Lane Group Flow (vph)	80	847	0	0	923	102	527	532	568	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	19.2	47.0			32.0	32.0	37.3	37.3	45.0			
Effective Green, g (s)	18.7	47.0			32.0	32.0	37.3	37.3	45.0			
Actuated g/C Ratio	0.19	0.47			0.32	0.32	0.37	0.37	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	331	2390			1484	507	627	550	677			
v/s Ratio Prot	0.05	c0.17			c0.20		0.31	c0.36	c0.38			
v/s Ratio Perm						0.06						
v/c Ratio	0.24	0.35			0.62	0.20	0.84	0.97	0.84			
Uniform Delay, d1	34.6	16.9			28.9	24.7	28.6	30.8	24.3			
Progression Factor	0.49	0.56			0.52	0.28	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.4			1.7	0.8	10.1	30.1	9.2			
Delay (s)	18.7	9.7			16.6	7.7	38.8	60.9	33.5			
Level of Service	B	A			B	A	D	E	C			
Approach Delay (s)		10.5			14.3			44.8			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1805	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1805	2628
Volume (vph)	407	1105	319	45	595	78	42	3	42	82	45	517
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	442	1201	347	49	647	85	46	3	46	89	49	562
RTOR Reduction (vph)	0	0	168	0	0	20	0	0	43	0	0	201
Lane Group Flow (vph)	442	1201	179	49	647	65	24	25	3	0	138	361
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.5	41.2	52.2	6.8	26.5	26.5	7.5	7.5	7.5		30.5	51.0
Effective Green, g (s)	20.0	40.7	51.7	6.3	27.0	27.0	7.0	7.0	7.0		30.0	50.0
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	687	1380	745	112	956	427	118	119	111		542	1314
v/s Ratio Prot	0.13	c0.35	c0.12	0.03	c0.18		0.01	0.01			0.08	c0.14
v/s Ratio Perm						0.04			0.00			
v/c Ratio	0.64	0.87	0.24	0.44	0.68	0.15	0.20	0.21	0.03		0.25	0.27
Uniform Delay, d1	36.7	27.2	13.3	45.1	32.6	27.8	43.9	43.9	43.3		26.5	14.5
Progression Factor	1.15	0.54	0.36	0.74	0.68	0.62	1.00	1.00	1.00		1.23	2.78
Incremental Delay, d2	3.4	5.9	0.1	0.9	3.4	0.7	0.6	0.6	0.1		1.1	0.5
Delay (s)	45.6	20.6	4.9	34.5	25.6	17.8	44.5	44.5	43.4		33.8	40.8
Level of Service	D	C	A	C	C	B	D	D	D		C	D
Approach Delay (s)		23.4			25.3			44.0			39.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3525			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3525			1863	
Volume (vph)	35	26	200	6	0	20	0	342	9	0	91	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	372	10	0	99	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	380	0	0	99	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	3				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1502			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.11			0.05	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.25			0.16	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.5			22.9	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.49	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.4			0.5	
Delay (s)	17.0	17.0	14.7	47.7		47.0		18.9			34.7	
Level of Service	B	B	B	D		D		B			C	
Approach Delay (s)		15.2			47.1			18.9			34.7	
Approach LOS		B			D			B			C	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3331		1770	3468		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3331		1770	3468		1770	1827		1770	1863	1583
Volume (vph)	355	345	223	34	388	60	214	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	375	242	37	422	65	233	188	28	28	153	101
RTOR Reduction (vph)	0	78	0	0	12	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	539	0	37	475	0	233	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	31.2	48.1		5.7	22.6		17.7	17.7		13.5	13.5	13.5
Effective Green, g (s)	30.7	48.6		5.2	23.1		17.2	17.2		13.0	13.0	13.0
Actuated g/C Ratio	0.31	0.49		0.05	0.23		0.17	0.17		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	543	1619		92	801		304	314		230	242	206
v/s Ratio Prot	c0.22	0.16		0.02	c0.14		c0.13	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.71	0.33		0.40	0.59		0.77	0.67		0.12	0.63	0.06
Uniform Delay, d1	30.7	15.8		45.9	34.3		39.5	38.7		38.5	41.2	38.2
Progression Factor	0.56	0.71		1.00	1.00		0.98	0.98		0.86	0.90	1.15
Incremental Delay, d2	2.6	0.3		2.9	3.2		11.0	5.3		0.2	5.2	0.1
Delay (s)	19.7	11.6		48.8	37.5		49.6	43.1		33.3	42.2	43.8
Level of Service	B	B		D	D		D	D		C	D	D
Approach Delay (s)		14.7			38.3			46.5			41.9	
Approach LOS		B			D			D			D	

Intersection Summary					
HCM Average Control Delay	29.9	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3360		1770	3509		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3360		1770	3509		1770	3479		1770	3498	
Volume (vph)	68	176	89	89	366	22	103	447	57	49	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	191	97	97	398	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	73	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	215	0	97	417	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	13.7		9.0	16.3		11.4	55.1		7.2	50.9	
Effective Green, g (s)	5.4	14.2		8.0	16.8		10.4	55.6		6.2	51.4	
Actuated g/C Ratio	0.05	0.14		0.08	0.17		0.10	0.56		0.06	0.51	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	477		142	590		184	1934		110	1798	
v/s Ratio Prot	0.04	0.06		c0.05	c0.12		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.45		0.68	0.71		0.61	0.28		0.48	0.39	
Uniform Delay, d1	46.7	39.3		44.8	39.3		42.9	11.7		45.3	14.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.7		12.7	3.9		5.6	0.4		3.3	0.6	
Delay (s)	77.6	40.0		57.5	43.1		48.5	12.0		48.6	15.4	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		47.7			45.8			18.2			17.7	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM Average Control Delay	28.9	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3432		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3432		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	167	42	43	296	61	46	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	182	46	47	322	66	50	58	33	3	25	10
RTOR Reduction (vph)	0	13	0	0	0	27	0	25	0	0	9	0
Lane Group Flow (vph)	26	215	0	47	322	39	50	66	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	56.3		5.4	58.5	58.5	10.4	10.4			13.4	
Effective Green, g (s)	2.7	56.3		4.9	58.5	58.5	9.9	9.9			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.10	0.10			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1932		87	2070	926	175	174			231	
v/s Ratio Prot	0.01	0.06		c0.03	c0.09		0.03	c0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.11		0.54	0.16	0.04	0.29	0.38			0.13	
Uniform Delay, d1	48.0	10.2		46.4	9.5	8.8	41.8	42.2			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	0.7	1.0			0.2	
Delay (s)	57.5	10.3		51.8	9.6	8.9	42.4	43.2			38.7	
Level of Service	E	B		D	A	A	D	D			D	
Approach Delay (s)		15.1			14.1			42.9			38.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3432		1770	3539	1583	1770	1863	1583	1770	1841	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3432		1770	3539	1583	1770	1863	1583	1770	1841	
Volume (vph)	28	152	39	51	372	155	118	221	39	60	122	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	42	55	404	168	128	240	42	65	133	11
RTOR Reduction (vph)	0	17	0	0	0	83	0	0	34	0	3	0
Lane Group Flow (vph)	30	190	0	55	404	85	128	240	8	65	141	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	48.0		7.0	50.4	50.4	11.6	22.9	18.9	7.6	18.9	
Effective Green, g (s)	4.1	48.0		6.5	50.4	50.4	11.1	22.4	18.4	7.1	18.4	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.11	0.22	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1647		115	1784	798	196	417	291	126	339	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.07	c0.13		0.04	0.08	
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.41	0.12		0.48	0.23	0.11	0.65	0.58	0.03	0.52	0.42	
Uniform Delay, d1	46.8	14.3		45.1	13.9	13.0	42.6	34.6	33.5	44.8	36.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.07	0.92	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.3	6.8	1.6	0.0	2.6	0.6	
Delay (s)	49.5	14.5		47.4	14.2	13.3	49.4	36.1	33.5	50.6	33.7	
Level of Service	D	B		D	B	B	D	D	C	D	C	
Approach Delay (s)		18.9			16.8			40.0			38.9	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	209	16	90	552	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	227	17	98	600	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	623			245			786	1107	122	1060	1104	311
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	623			245			786	1107	122	1060	1104	311
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			89	92	91	98	98	100
cM capacity (veh/h)	954			1319			257	188	906	142	189	684

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	151	93	98	400	223	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	954	1700	1700	1319	1700	1700	240	693	191
Volume to Capacity	0.03	0.09	0.05	0.07	0.24	0.13	0.15	0.13	0.03
Queue Length 95th (ft)	2	0	0	6	0	0	13	11	3
Control Delay (s)	8.9	0.0	0.0	7.9	0.0	0.0	22.6	10.9	24.5
Lane LOS	A			A			C	B	C
Approach Delay (s)	0.9			1.1			14.3		24.5
Approach LOS							B		C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.98			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3499		1770	3485			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3499		1770	3485			850	1583		1568	
Volume (vph)	3	255	21	69	467	53	85	66	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	277	23	75	508	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	296	0	75	560	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.49		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1725		122	1945			183	340		99	
v/s Ratio Prot	0.00	c0.08		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.17		0.61	0.29			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.0		45.3	11.6			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.04	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.4	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.3		53.5	7.3			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.7			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	42.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3396		1770	3372		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3396		1770	3372		3433	3533		1770	3500	
Volume (vph)	92	205	75	29	297	137	232	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	223	82	32	323	149	252	776	9	147	736	59
RTOR Reduction (vph)	0	44	0	0	58	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	261	0	32	414	0	252	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	17.2		8.7	17.1		15.0	48.7		12.4	46.1	
Effective Green, g (s)	7.8	16.2		7.7	16.1		14.0	48.7		11.4	46.1	
Actuated g/C Ratio	0.08	0.16		0.08	0.16		0.14	0.49		0.11	0.46	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	550		136	543		481	1721		202	1614	
v/s Ratio Prot	c0.06	0.08		0.02	c0.12		0.07	c0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.24	0.76		0.52	0.46		0.73	0.49	
Uniform Delay, d1	45.1	38.0		43.4	40.1		39.9	16.9		42.8	18.8	
Progression Factor	1.28	1.26		1.17	1.17		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.6	0.5		0.3	5.5		0.5	0.9		10.5	1.1	
Delay (s)	72.2	48.5		51.3	52.6		40.4	17.8		53.3	19.8	
Level of Service	E	D		D	D		D	B		D	B	
Approach Delay (s)		54.3			52.6			23.3			25.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3488		1770	3484			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3488		1770	3484			3189			2945	
Volume (vph)	48	276	29	6	392	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	300	32	7	426	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	320	0	7	461	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2044		21	1916			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.13							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.24			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.8			18.3			19.3	
Progression Factor	0.52	1.46		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.6	7.0		27.9	6.1			18.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.9			6.4			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	98	50	2	8	67	26	2	1	2	16	4	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	107	54	2	9	73	28	2	1	2	17	4	85

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	107	57	110	5	107
Volume Left (vph)	107	0	9	2	17
Volume Right (vph)	0	2	28	2	85
Hadj (s)	0.53	0.01	-0.10	-0.13	-0.41
Departure Headway (s)	5.4	4.8	4.3	4.5	4.1
Degree Utilization, x	0.16	0.08	0.13	0.01	0.12
Capacity (veh/h)	655	719	794	736	810
Control Delay (s)	8.2	7.0	8.0	7.6	7.7
Approach Delay (s)	7.8		8.0	7.6	7.7
Approach LOS	A		A	A	A

Intersection Summary				
Delay	7.8			
HCM Level of Service	A			
Intersection Capacity Utilization	25.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.18	0.18			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	

Intersection Summary						
HCM Average Control Delay	23.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	45.6	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	36.8%	ICU Level of Service		A		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3504			3478	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3504			3478	
Volume (vph)	51	103	9	77	117	20	0	871	62	0	695	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	947	67	0	755	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1010	0	0	846	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2295	
v/s Ratio Prot					c0.07			c0.29			0.24	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.44			0.37	
Uniform Delay, d1		44.2			44.1			8.5			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.1			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.1			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3534			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3292			5073	
Volume (vph)	0	0	0	65	296	663	12	427	0	0	679	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	464	0	0	738	12
RTOR Reduction (vph)	0	0	0	0	0	251	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	470	0	477	0	0	748	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					31.5	31.5		59.5			59.5	
Effective Green, g (s)					31.5	31.5		60.5			60.5	
Actuated g/C Ratio					0.32	0.32		0.60			0.60	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1105	499		1992			3069	
v/s Ratio Prot					0.11						c0.15	
v/s Ratio Perm						c0.30		0.14				
v/c Ratio					0.36	0.94		0.24			0.24	
Uniform Delay, d1					26.4	33.4		9.1			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	26.2		0.3			0.2	
Delay (s)					26.5	59.6		9.4			9.3	
Level of Service					C	E		A			A	
Approach Delay (s)		0.0			47.9			9.4			9.3	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	27.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3479		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3479		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	421	54	221	491	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	458	59	240	534	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	509	0	240	534	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						38.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1943		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.26		0.48	0.20	
Uniform Delay, d1		28.4						8.0		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.3	0.0	
Delay (s)		28.7						8.3		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.3			10.3	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3444		1770	3504		1770	3420		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3444		1770	3504		1770	3420		1770	1863	1583
Volume (vph)	263	614	134	105	745	52	170	402	116	130	256	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	146	114	810	57	185	437	126	141	278	501
RTOR Reduction (vph)	0	16	0	0	4	0	0	25	0	0	0	318
Lane Group Flow (vph)	286	797	0	114	863	0	185	538	0	141	278	183
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	42.3		11.5	33.4		19.4	19.4		19.8	19.8	19.8
Effective Green, g (s)	20.4	43.3		11.5	34.4		19.4	19.4		19.8	19.8	19.8
Actuated g/C Ratio	0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1356		185	1096		312	603		319	335	285
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.10	c0.16		0.08	c0.15	
v/s Ratio Perm												0.12
v/c Ratio	0.87	0.59		0.62	0.79		0.59	0.89		0.44	0.83	0.64
Uniform Delay, d1	43.5	26.3		47.1	34.5		41.7	44.3		40.2	43.5	41.8
Progression Factor	1.00	1.00		1.34	0.66		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	1.9		4.7	4.5		2.2	13.6		1.0	15.5	4.9
Delay (s)	65.1	28.2		67.8	27.2		43.4	57.8		41.2	59.0	46.7
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		37.8			31.9			54.2			49.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3437		1770	3496		1770	3470	
Flt Permitted	0.14	1.00			0.82		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	255	3426			2822		1770	3496		1770	3470	
Volume (vph)	96	588	159	24	608	142	172	893	79	181	781	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	26	661	154	187	971	86	197	849	127
RTOR Reduction (vph)	0	27	0	0	21	0	0	5	0	0	8	0
Lane Group Flow (vph)	104	785	0	0	820	0	187	1052	0	197	968	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.7	34.7			34.7		15.2	47.3		15.0	47.1	
Effective Green, g (s)	34.7	34.7			34.7		15.2	48.3		15.0	48.1	
Actuated g/C Ratio	0.32	0.32			0.32		0.14	0.44		0.14	0.44	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	80	1081			890		245	1535		241	1517	
v/s Ratio Prot		0.23					c0.11	c0.30		c0.11	0.28	
v/s Ratio Perm	c0.41				0.29							
v/c Ratio	1.30	0.73			0.92		0.76	0.69		0.82	0.64	
Uniform Delay, d1	37.6	33.4			36.3		45.7	24.8		46.2	24.2	
Progression Factor	1.05	1.06			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	190.4	2.0			14.6		13.2	2.5		18.9	2.1	
Delay (s)	230.1	37.2			50.9		58.8	27.3		65.1	26.2	
Level of Service	F	D			D		E	C		E	C	
Approach Delay (s)		59.1			50.9			32.0			32.7	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM Average Control Delay	42.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	142	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	154	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	461	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	461	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	85	100	100	100
cM capacity (veh/h)	1598			1595			603	556	1057	407	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	158	2
Volume Left	1	133	2	1
Volume Right	0	0	154	0
cSH	1598	1595	1040	470
Volume to Capacity	0.00	0.08	0.15	0.00
Queue Length 95th (ft)	0	7	13	0
Control Delay (s)	0.4	6.6	9.1	12.7
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.1	12.7
Approach LOS			A	B

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	103	78	6	147	85	106	10	375	220	16	178	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	85	7	160	92	115	11	408	239	17	193	72

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	112	91	160	208	658	17	265
Volume Left (vph)	112	0	160	0	11	17	0
Volume Right (vph)	0	7	0	115	239	0	72
Hadj (s)	0.53	-0.02	0.53	-0.35	-0.18	0.53	-0.16
Departure Headway (s)	8.5	8.0	8.2	7.3	6.8	8.0	7.3
Degree Utilization, x	0.27	0.20	0.36	0.42	1.24	0.04	0.54
Capacity (veh/h)	405	432	427	479	537	433	468
Control Delay (s)	13.4	11.8	14.6	14.3	146.2	10.1	17.5
Approach Delay (s)	12.7		14.4		146.2	17.0	
Approach LOS	B		B		F	C	

Intersection Summary				
Delay	72.0			
HCM Level of Service	F			
Intersection Capacity Utilization	68.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	314	0	0	338	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	341	0	0	367	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			341		709	341
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			341		709	341
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1218		401	701

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	341	367	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1218	1700
Volume to Capacity	0.20	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	21.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1759			1795		1770	1843		1770	1754	
Flt Permitted		0.82			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1464			1590		1770	1843		1770	1754	
Volume (vph)	137	148	68	36	93	20	163	604	39	19	317	125
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	149	161	74	39	101	22	177	657	42	21	345	136
RTOR Reduction (vph)	0	16	0	0	11	0	0	4	0	0	26	0
Lane Group Flow (vph)	0	368	0	0	151	0	177	695	0	21	455	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.4			16.4		7.4	25.7		1.4	19.7	
Effective Green, g (s)		15.9			15.9		6.9	26.2		0.9	20.2	
Actuated g/C Ratio		0.29			0.29		0.13	0.48		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		423			460		222	878		29	644	
v/s Ratio Prot							c0.10	c0.38		0.01	0.26	
v/s Ratio Perm		c0.25			0.10							
v/c Ratio		0.87			0.33		0.80	0.79		0.72	0.71	
Uniform Delay, d1		18.6			15.4		23.4	12.1		26.9	14.9	
Progression Factor		1.00			1.00		0.90	1.04		0.97	1.07	
Incremental Delay, d2		17.4			0.3		14.6	6.1		53.3	5.7	
Delay (s)		35.9			15.7		35.7	18.7		79.4	21.6	
Level of Service		D			B		D	B		E	C	
Approach Delay (s)		35.9			15.7			22.1			24.0	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	146	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	159	72	5	128	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	68	249	135
Volume Left (vph)	4	57	18	5
Volume Right (vph)	64	12	72	1
Hadj (s)	-0.42	0.09	-0.12	0.04
Departure Headway (s)	4.5	5.0	4.3	4.6
Degree Utilization, x	0.10	0.09	0.30	0.17
Capacity (veh/h)	733	660	803	743
Control Delay (s)	8.0	8.5	9.1	8.5
Approach Delay (s)	8.0	8.5	9.1	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.7		
HCM Level of Service	A		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	57	34	19	538	292	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	37	21	585	317	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	967	341	364			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	967	341	364			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	95	98			
cM capacity (veh/h)	277	702	1194			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	99	21	585	364
Volume Left	62	21	0	0
Volume Right	37	0	0	47
cSH	358	1194	1700	1700
Volume to Capacity	0.28	0.02	0.34	0.21
Queue Length 95th (ft)	28	1	0	0
Control Delay (s)	18.8	8.1	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.8	0.3		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		1.9		
Intersection Capacity Utilization		40.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3393		3539	1488		3527
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3393		3539	1488		3245
Volume (vph)	657	57	396	221	24	446
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	714	62	430	240	26	485
RTOR Reduction (vph)	6	0	0	131	0	0
Lane Group Flow (vph)	770	0	430	109	0	511
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1604		1609	676		1475
v/s Ratio Prot	c0.23		0.12			
v/s Ratio Perm				0.07		c0.16
v/c Ratio	0.48		0.27	0.16		0.35
Uniform Delay, d1	19.8		18.6	17.7		19.4
Progression Factor	0.45		0.14	0.07		1.00
Incremental Delay, d2	0.9		0.2	0.3		0.6
Delay (s)	9.8		2.8	1.5		20.1
Level of Service	A		A	A		C
Approach Delay (s)	9.8		2.3			20.1
Approach LOS	A		A			C

Intersection Summary				
HCM Average Control Delay	9.9	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	204	34	472	611	197	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	37	513	664	214	263
RTOR Reduction (vph)	0	20	0	0	0	157
Lane Group Flow (vph)	222	17	513	664	214	106
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	17.9	49.7	28.3	85.1	53.3	17.9
Effective Green, g (s)	17.4	49.2	27.8	84.6	52.8	17.4
Actuated g/C Ratio	0.16	0.45	0.25	0.77	0.48	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	280	708	868	1433	894	250
v/s Ratio Prot	c0.13	0.01	c0.15	c0.36	0.11	0.07
v/s Ratio Perm						
v/c Ratio	0.79	0.02	0.59	0.46	0.24	0.43
Uniform Delay, d1	44.6	17.0	36.1	4.6	16.8	41.8
Progression Factor	0.50	0.02	0.69	0.29	1.00	1.00
Incremental Delay, d2	13.8	0.0	0.9	0.9	0.6	1.2
Delay (s)	36.0	0.4	25.9	2.2	17.4	43.0
Level of Service	D	A	C	A	B	D
Approach Delay (s)	30.9			12.6	31.5	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Volume (vph)	172	370	60	441	14	0	11	641	1135	252	519	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	479	15	0	12	697	1234	274	564	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	240	254	0	12	697	1234	274	612	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.5	16.5	16.5	17.0	17.0		1.1	22.6	88.0	16.4	37.9	
Effective Green, g (s)	16.0	16.0	16.0	17.0	17.0		0.6	23.1	88.0	15.9	38.4	
Actuated g/C Ratio	0.18	0.18	0.18	0.19	0.19		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	322	339	288	325	326		12	929	1583	320	796	
v/s Ratio Prot	0.11	c0.22		0.14	0.15		0.01	0.20		0.15	0.34	
v/s Ratio Perm			0.03						c0.78			
v/c Ratio	0.58	1.19	0.17	0.74	0.78		1.00	0.75	0.78	0.86	0.77	
Uniform Delay, d1	32.9	36.0	30.4	33.4	33.7		43.7	29.8	0.0	34.9	21.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	109.5	0.1	8.0	10.8		259.8	3.3	3.9	18.9	4.3	
Delay (s)	34.7	145.5	30.5	41.4	44.5		303.5	33.1	3.9	53.9	25.3	
Level of Service	C	F	C	D	D		F	C	A	D	C	
Approach Delay (s)		102.4			43.0			16.2			34.1	
Approach LOS		F			D			B			C	

Intersection Summary				
HCM Average Control Delay	37.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			2999	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			2999	1399				3433		1583
Volume (vph)	140	394	572	0	521	1548	0	0	0	733	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	1683	0	0	0	797	0	359
RTOR Reduction (vph)	0	207	0	0	155	0	0	0	0	0	0	261
Lane Group Flow (vph)	152	843	0	0	995	1099	0	0	0	797	0	98
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	71.9			47.9	110.0				29.6		29.6
Effective Green, g (s)	20.0	71.9			47.9	110.0				30.1		30.1
Actuated g/C Ratio	0.18	0.65			0.44	1.00				0.27		0.27
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2108			1306	1399				939		433
v/s Ratio Prot	0.09	0.26			0.33							0.06
v/s Ratio Perm						c0.79				0.23		
v/c Ratio	0.47	0.40			0.76	0.79				0.85		0.23
Uniform Delay, d1	40.3	8.9			26.2	0.0				37.8		30.9
Progression Factor	1.00	1.00			0.61	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.0	1.0				7.1		0.2
Delay (s)	40.7	9.5			17.0	1.0				44.9		31.1
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.4			9.2			0.0			40.6	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	18.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1525	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1525	659			
Volume (vph)	141	986	0	0	1519	460	550	226	910	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1072	0	0	1651	500	598	246	989	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	66	17	0	0	0
Lane Group Flow (vph)	153	1072	0	0	1651	237	598	674	478	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	513	335			
v/s Ratio Prot	0.09	c0.30			c0.36		0.36	0.44	c0.73			
v/s Ratio Perm						0.18						
v/c Ratio	0.45	0.72			0.98	0.48	1.06	1.31	1.43			
Uniform Delay, d1	39.4	26.6			34.6	27.0	36.5	36.5	27.0			
Progression Factor	1.55	0.39			0.94	1.30	1.00	1.00	1.00			
Incremental Delay, d2	3.4	2.4			12.6	2.0	54.3	154.9	209.0			
Delay (s)	64.6	12.7			45.3	37.1	90.8	191.4	236.0			
Level of Service	E	B			D	D	F	F	F			
Approach Delay (s)		19.2			43.4			170.6			0.0	
Approach LOS		B			D			F			A	

Intersection Summary				
HCM Average Control Delay	82.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1814	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1814	2628
Volume (vph)	460	765	671	259	989	178	132	16	66	188	163	743
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	832	729	282	1075	193	143	17	72	204	177	808
RTOR Reduction (vph)	0	7	140	0	0	25	0	0	63	0	0	85
Lane Group Flow (vph)	500	918	496	282	1075	169	78	82	9	0	381	723
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		495	1123
v/s Ratio Prot	0.15	0.28	c0.41	0.16	c0.30		0.05	0.05			c0.21	0.28
v/s Ratio Perm						0.11			0.01			
v/c Ratio	0.94	0.92	0.88	1.03	1.01	0.35	0.36	0.38	0.05		0.77	0.64
Uniform Delay, d1	46.0	37.2	26.7	46.5	38.5	30.2	43.9	44.0	42.1		36.8	24.9
Progression Factor	1.23	0.97	0.99	1.00	1.00	1.00	1.02	1.02	2.14		0.68	0.28
Incremental Delay, d2	4.2	1.8	1.6	62.1	30.7	2.1	0.7	0.8	0.1		10.2	2.6
Delay (s)	61.0	37.8	28.1	108.6	69.2	32.2	45.7	45.8	90.1		35.3	9.6
Level of Service	E	D	C	F	E	C	D	D	F		D	A
Approach Delay (s)		40.4			71.8			59.5			17.8	
Approach LOS		D			E			E			B	

Intersection Summary				
HCM Average Control Delay	45.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	912	25	0	231	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	991	27	0	251	0
RTOR Reduction (vph)	0	0	414	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	359	51	0	7	0	1016	0	0	251	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.13	c0.03				c0.29			0.13	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.28	0.42		0.07		0.63			0.38	
Uniform Delay, d1	23.1	23.0	18.1	49.2		48.0		23.0			26.2	
Progression Factor	1.23	1.22	3.50	1.00		1.00		1.00			1.45	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		1.9			1.6	
Delay (s)	28.8	28.3	63.4	50.9		48.2		24.9			39.5	
Level of Service	C	C	E	D		D		C			D	
Approach Delay (s)		55.2			49.1			24.9			39.5	
Approach LOS		E			D			C			D	

Intersection Summary				
HCM Average Control Delay	40.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3429		1770	3466		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3429		1770	3466		1770	1843		1770	1863	1537
Volume (vph)	169	679	127	20	566	55	486	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	738	138	22	615	60	528	455	29	63	215	170
RTOR Reduction (vph)	0	14	0	0	6	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	862	0	22	669	0	528	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		46.0	46.0		16.0	16.0	16.0
Effective Green, g (s)	10.0	30.9		2.1	23.0		45.5	45.5		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	963		34	725		732	762		249	263	217
v/s Ratio Prot	c0.10	c0.25		0.01	c0.19		c0.30	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.14	0.90		0.65	0.92		0.72	0.63		0.25	0.82	0.11
Uniform Delay, d1	50.0	38.0		53.6	42.6		27.0	25.6		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.99	1.00		1.07	1.04	1.76
Incremental Delay, d2	114.5	12.6		35.3	19.1		3.5	1.7		0.5	16.7	0.2
Delay (s)	164.5	50.6		88.8	61.7		30.1	27.3		45.6	64.3	72.9
Level of Service	F	D		F	E		C	C		D	E	E
Approach Delay (s)		70.4			62.6			28.7			64.9	
Approach LOS		E			E			C			E	

Intersection Summary				
HCM Average Control Delay	54.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3408		1770	3465		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3408		1770	3465		1770	3483		1770	3483	
Volume (vph)	128	569	186	100	371	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	618	202	109	403	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	36	0	0	15	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	784	0	109	454	0	152	1180	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.1		8.4	22.1		11.9	32.5		10.0	30.6	
Effective Green, g (s)	9.4	24.6		7.4	22.6		10.9	33.0		9.0	31.1	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.12	0.37		0.10	0.35	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	932		146	870		214	1277		177	1204	
v/s Ratio Prot	c0.08	c0.23		0.06	0.13		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.84		0.75	0.52		0.71	0.92		0.69	0.87	
Uniform Delay, d1	39.2	30.9		40.4	29.0		38.0	27.3		39.1	27.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	7.0		18.6	0.6		10.6	12.5		10.6	8.5	
Delay (s)	54.9	37.8		59.0	29.6		48.6	39.8		49.8	36.0	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		40.3			35.2			40.8			37.5	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	38.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3397		1770	3539	1524	1770	1684			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3397		1770	3539	1524	1770	1684			1805	
Volume (vph)	24	588	177	80	590	27	187	106	108	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	639	192	87	641	29	203	115	117	46	115	21
RTOR Reduction (vph)	0	20	0	0	0	15	0	42	0	0	5	0
Lane Group Flow (vph)	26	811	0	87	641	14	203	190	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	45.2		7.9	49.9	49.9	16.7	16.7			15.7	
Effective Green, g (s)	2.7	45.2		7.4	49.9	49.9	16.2	16.2			15.2	
Actuated g/C Ratio	0.03	0.45		0.07	0.50	0.50	0.16	0.16			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1535		131	1766	760	287	273			274	
v/s Ratio Prot	0.01	c0.24		c0.05	0.18		c0.11	0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.53		0.66	0.36	0.02	0.71	0.70			0.65	
Uniform Delay, d1	48.0	19.7		45.1	15.3	12.7	39.7	39.6			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.3		10.8	0.6	0.0	7.2	6.9			4.6	
Delay (s)	57.5	21.0		55.9	15.9	12.7	46.8	46.5			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		22.1			20.4			46.7			44.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	66.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3425		1770	3539	1496	1770	1863	1520	1770	1811	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3425		1770	3539	1496	1770	1863	1520	1770	1811	
Volume (vph)	46	544	116	141	498	159	182	275	115	159	303	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	126	153	541	173	198	299	125	173	329	55
RTOR Reduction (vph)	0	16	0	0	0	99	0	0	95	0	6	0
Lane Group Flow (vph)	50	701	0	153	541	74	198	299	30	173	378	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	37.1		12.2	42.6	42.6	12.5	24.2	24.2	12.0	23.7	
Effective Green, g (s)	6.2	37.1		11.7	42.6	42.6	12.0	23.7	23.7	11.5	23.2	
Actuated g/C Ratio	0.06	0.37		0.12	0.43	0.43	0.12	0.24	0.24	0.12	0.23	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1271		207	1508	637	212	442	360	204	420	
v/s Ratio Prot	0.03	c0.20		c0.09	0.15		c0.11	0.16		0.10	c0.21	
v/s Ratio Perm						0.05			0.02			
v/c Ratio	0.45	0.55		0.74	0.36	0.12	0.93	0.68	0.08	0.85	0.90	
Uniform Delay, d1	45.3	24.9		42.7	19.4	17.3	43.6	34.7	29.7	43.4	37.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.96	
Incremental Delay, d2	2.2	1.7		12.2	0.7	0.4	43.4	3.7	0.1	25.3	20.8	
Delay (s)	47.4	26.6		54.9	20.1	17.7	87.0	38.4	29.8	67.4	56.7	
Level of Service	D	C		D	C	B	F	D	C	E	E	
Approach Delay (s)		28.0			25.8			52.1			60.0	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM Average Control Delay	39.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	742	44	96	791	12	33	12	98	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	807	48	104	860	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	873			854			1531	1960	427	1639	1977	436
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	873			854			1531	1960	427	1639	1977	436
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			87			40	75	81	100	83	98
cM capacity (veh/h)	769			781			60	53	576	39	51	568

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	538	317	104	573	300	42	113	18
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	769	1700	1700	781	1700	1700	59	366	99
Volume to Capacity	0.03	0.32	0.19	0.13	0.34	0.18	0.72	0.31	0.19
Queue Length 95th (ft)	2	0	0	12	0	0	77	32	16
Control Delay (s)	9.8	0.0	0.0	10.3	0.0	0.0	157.6	19.2	49.5
Lane LOS	A			B			F	C	E
Approach Delay (s)	0.3			1.1			56.9		49.5
Approach LOS							F		E

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3448		1770	3480			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3448		1770	3480			1808	1555		1811	
Volume (vph)	30	750	101	124	712	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	815	110	135	774	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	9	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	916	0	135	831	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	37.5		11.4	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.5		10.9	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.08	0.38		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1293		193	1399			380	327		264	
v/s Ratio Prot	0.02	c0.27		c0.08	0.24			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.71		0.70	0.59			0.86	0.22		0.71	
Uniform Delay, d1	42.9	26.6		43.0	23.5			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.19	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	3.3		3.9	0.7			17.8	0.3		7.8	
Delay (s)	43.5	29.9		54.9	15.2			55.9	33.0		48.4	
Level of Service	D	C		D	B			E	C		D	
Approach Delay (s)		30.4			20.7			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3296		1770	3369		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3296		1770	3369		3433	3529		1770	3467	
Volume (vph)	205	523	287	46	388	146	408	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	568	312	50	422	159	443	1035	16	241	1052	111
RTOR Reduction (vph)	0	74	0	0	40	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	806	0	50	541	0	443	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.4	28.4		5.7	18.7		14.0	37.6		15.3	38.9	
Effective Green, g (s)	14.4	27.4		4.7	17.7		13.0	37.6		14.3	38.9	
Actuated g/C Ratio	0.14	0.27		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	255	903		83	596		446	1327		253	1349	
v/s Ratio Prot	c0.13	c0.24		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.87	0.89		0.60	0.91		0.99	0.79		0.95	0.86	
Uniform Delay, d1	41.9	34.9		46.7	40.4		43.5	27.7		42.5	28.0	
Progression Factor	0.63	0.79		1.03	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.9	8.8		7.9	16.8		40.6	4.9		43.1	7.2	
Delay (s)	47.4	36.2		56.1	54.1		84.1	32.6		85.6	35.1	
Level of Service	D	D		E	D		F	C		F	D	
Approach Delay (s)		38.5			54.3			47.9			43.8	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	45.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3438			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3438			3156			2746	
Volume (vph)	16	643	16	9	450	89	19	212	23	75	166	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	699	17	10	489	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	24	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	713	0	10	562	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1967			549			478	
v/s Ratio Prot	c0.01	c0.20		0.01	0.16							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.35		0.48	0.29			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.01	1.22		1.00	1.00			1.00			1.00	
Incremental Delay, d2	21.3	0.2		6.1	0.4			0.6			1.9	
Delay (s)	46.1	7.1		30.6	5.8			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.0			6.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	276	75	11	86	78	46	19	83	50	65	59	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	300	82	12	93	85	50	21	90	54	71	64	201

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	300	93	228	165	336
Volume Left (vph)	300	0	93	21	71
Volume Right (vph)	0	12	50	54	201
Hadj (s)	0.53	-0.06	-0.02	-0.14	-0.28
Departure Headway (s)	7.1	6.5	6.4	6.5	5.9
Degree Utilization, x	0.59	0.17	0.41	0.30	0.55
Capacity (veh/h)	488	528	504	486	569
Control Delay (s)	18.4	9.6	13.7	12.1	15.9
Approach Delay (s)	16.3		13.7	12.1	15.9
Approach LOS	C		B	B	C

Intersection Summary				
Delay	15.1			
HCM Level of Service	C			
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	

Intersection Summary					
HCM Average Control Delay	11.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	46.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3509			3500	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3509			3500	
Volume (vph)	73	162	14	96	123	36	0	1111	66	0	1211	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1208	72	0	1316	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1277	0	0	1415	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2160	
v/s Ratio Prot					c0.08			0.36			c0.40	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.59			0.66	
Uniform Delay, d1		42.7			43.5			12.1			12.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.6	
Delay (s)		46.7			45.4			13.3			14.5	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.3			14.5	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3184			5073	
Volume (vph)	0	0	0	64	237	549	19	816	0	0	1198	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	887	0	0	1302	22
RTOR Reduction (vph)	0	0	0	0	0	113	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	484	0	908	0	0	1322	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1946			3100	
v/s Ratio Prot					0.09						0.26	
v/s Ratio Perm						c0.31		c0.29				
v/c Ratio					0.31	1.02		0.47			0.43	
Uniform Delay, d1					24.3	31.5		9.5			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	45.9		0.8			0.4	
Delay (s)					24.4	77.4		10.3			9.6	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			58.6			10.3			9.6	
Approach LOS		A			E			B			A	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3491		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3491		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	783	78	592	706	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	851	85	643	767	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	930	0	643	767	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	78.2	
Effective Green, g (s)		23.8						49.1		25.1	78.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1558		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.22	
v/s Ratio Perm												
v/c Ratio		0.82						0.60		0.82	0.30	
Uniform Delay, d1		41.1						23.0		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.7		6.6	0.0	
Delay (s)		48.0						24.7		46.9	5.9	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.7			24.6	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	127	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	138	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	340	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			208	201	13	340	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	87	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	510	658	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	141	12
Volume Left	0	87	0	1
Volume Right	0	1	138	3
cSH	1604	1605	1052	714
Volume to Capacity	0.00	0.05	0.13	0.02
Queue Length 95th (ft)	0	4	12	1
Control Delay (s)	0.0	6.4	9.0	10.1
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	9.0	10.1
Approach LOS			A	B

Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	26.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	73	35	13	128	42	20	13	357	227	17	260	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	38	14	139	46	22	14	388	247	18	283	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	79	52	139	67	649	18	325
Volume Left (vph)	79	0	139	0	14	18	0
Volume Right (vph)	0	14	0	22	247	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.19	0.53	-0.06
Departure Headway (s)	8.2	7.6	8.0	7.3	6.1	7.2	6.6
Degree Utilization, x	0.18	0.11	0.31	0.14	1.11	0.04	0.59
Capacity (veh/h)	415	451	430	471	589	487	527
Control Delay (s)	11.9	10.3	13.4	10.3	93.2	9.2	17.5
Approach Delay (s)	11.2		12.4		93.2	17.1	
Approach LOS	B		B		F	C	

Intersection Summary			
Delay	52.9		
HCM Level of Service	F		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	28	0	0	36	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	0	0	39	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			30		70	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			30		70	30
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1582		935	1044

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	30	39	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1582	1700
Volume to Capacity	0.02	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	111	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	121	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	196	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	-0.49	0.00	-0.17	0.04
Departure Headway (s)	4.1	4.5	4.0	4.3
Degree Utilization, x	0.02	0.08	0.22	0.08
Capacity (veh/h)	826	750	878	798
Control Delay (s)	7.1	7.9	8.1	7.7
Approach Delay (s)	7.1	7.9	8.1	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.9	
HCM Level of Service		A	
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	49	24	13	592	361	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	26	14	643	392	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1090	418	443			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1090	418	443			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	96	99			
cM capacity (veh/h)	235	635	1117			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	79	14	643	443
Volume Left	53	14	0	0
Volume Right	26	0	0	51
cSH	297	1117	1700	1700
Volume to Capacity	0.27	0.01	0.38	0.26
Queue Length 95th (ft)	26	1	0	0
Control Delay (s)	21.5	8.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	21.5	0.2		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		1.5		
Intersection Capacity Utilization	42.0%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3389		3539	1492		3525
Flt Permitted	0.96		1.00	1.00		0.91
Satd. Flow (perm)	3389		3539	1492		3228
Volume (vph)	844	76	347	394	26	387
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	917	83	377	428	28	421
RTOR Reduction (vph)	6	0	0	249	0	0
Lane Group Flow (vph)	994	0	377	179	0	449
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.51		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1725		1480	624		1350
v/s Ratio Prot	c0.29		0.11			
v/s Ratio Perm				0.12		c0.14
v/c Ratio	0.58		0.25	0.29		0.33
Uniform Delay, d1	18.8		20.8	21.2		21.6
Progression Factor	0.34		0.55	3.38		1.00
Incremental Delay, d2	1.2		0.2	0.7		0.7
Delay (s)	7.5		11.7	72.3		22.3
Level of Service	A		B	E		C
Approach Delay (s)	7.5		43.9			22.3
Approach LOS	A		D			C

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	353	51	660	803	230	276
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	384	55	717	873	250	300
RTOR Reduction (vph)	0	25	0	0	0	23
Lane Group Flow (vph)	384	30	717	873	250	277
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	27.7	60.7	29.5	75.3	42.3	73.5
Effective Green, g (s)	27.2	60.2	29.0	74.8	41.8	73.0
Actuated g/C Ratio	0.25	0.55	0.26	0.68	0.38	0.66
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	438	866	905	1267	708	1051
v/s Ratio Prot	c0.22	0.02	c0.21	c0.47	0.13	0.18
v/s Ratio Perm						
v/c Ratio	0.88	0.03	0.79	0.69	0.35	0.26
Uniform Delay, d1	39.8	11.5	37.7	10.6	24.4	7.5
Progression Factor	0.38	0.02	0.43	1.35	1.00	1.00
Incremental Delay, d2	16.0	0.0	3.1	2.0	1.4	0.1
Delay (s)	31.2	0.2	19.2	16.3	25.8	7.7
Level of Service	C	A	B	B	C	A
Approach Delay (s)	27.3			17.6	15.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Volume (vph)	26	21	7	719	13	16	41	247	889	120	394	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	782	14	17	45	268	966	130	428	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	412	400	0	45	268	966	130	459	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.2	3.2	3.2	23.0	23.0		3.6	17.2	66.5	7.6	21.2	
Effective Green, g (s)	2.7	2.7	2.7	23.0	23.0		3.1	17.7	66.5	7.1	21.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.35	0.35		0.05	0.27	1.00	0.11	0.33	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	64	581	581		83	942	1583	189	598	
v/s Ratio Prot	0.02	0.01		0.25	0.24		0.03	0.08		0.07	c0.25	
v/s Ratio Perm			0.00						c0.61			
v/c Ratio	0.39	0.30	0.01	0.71	0.69		0.54	0.28	0.61	0.69	0.77	
Uniform Delay, d1	31.1	31.0	30.6	18.9	18.7		31.0	19.4	0.0	28.6	20.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	3.7	3.1		3.8	0.1	1.8	8.0	5.6	
Delay (s)	32.4	31.8	30.6	22.5	21.8		34.8	19.5	1.8	36.7	25.8	
Level of Service	C	C	C	C	C		C	B	A	D	C	
Approach Delay (s)		31.9			22.2			6.6			28.2	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.97	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.94	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3080	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3080	1399				3433		1583
Volume (vph)	113	273	0	0	353	1076	0	0	0	890	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1170	0	0	0	967	0	263
RTOR Reduction (vph)	0	0	0	0	64	0	0	0	0	0	0	178
Lane Group Flow (vph)	123	297	0	0	577	913	0	0	0	967	0	85
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	66.6			51.3	110.0				34.9		34.9
Effective Green, g (s)	11.3	66.6			51.3	110.0				35.4		35.4
Actuated g/C Ratio	0.10	0.61			0.47	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2143			1436	1399				1105		509
v/s Ratio Prot	0.07	0.08			0.19							0.05
v/s Ratio Perm						c0.65				c0.28		
v/c Ratio	0.68	0.14			0.40	0.65				0.88		0.17
Uniform Delay, d1	47.6	9.3			19.3	0.0				35.2		26.7
Progression Factor	1.00	1.00			0.81	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.1			0.6	1.8				7.9		0.1
Delay (s)	55.2	9.5			16.3	1.8				43.1		26.8
Level of Service	E	A			B	A				D		C
Approach Delay (s)		22.9			7.8			0.0			39.6	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	64.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1451	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1451	659			
Volume (vph)	111	1052	0	0	1057	416	372	21	1055	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1143	0	0	1149	452	404	23	1147	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	288	0	164	4	0	0	0
Lane Group Flow (vph)	121	1143	0	0	1149	164	404	432	570	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	633	389			
v/s Ratio Prot	0.07	c0.32			c0.25		0.24	0.30	c0.86			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	0.95			0.68	0.31	0.55	0.68	1.47			
Uniform Delay, d1	48.6	35.7			29.8	25.2	23.0	24.9	22.5			
Progression Factor	1.18	0.60			0.95	1.89	1.00	1.00	1.00			
Incremental Delay, d2	12.3	15.8			1.8	1.2	3.0	5.9	223.0			
Delay (s)	69.5	37.0			30.0	49.0	26.0	30.8	245.5			
Level of Service	E	D			C	D	C	C	F			
Approach Delay (s)		40.1			35.4			107.8			0.0	
Approach LOS		D			D			F			A	

Intersection Summary			
HCM Average Control Delay	62.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1829	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1829	2628
Volume (vph)	516	450	1141	270	442	168	227	62	101	160	270	792
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	489	1240	293	480	183	247	67	110	174	293	861
RTOR Reduction (vph)	0	209	95	0	0	76	0	0	98	0	0	78
Lane Group Flow (vph)	561	900	525	293	480	107	153	161	12	0	467	783
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		499	1266
v/s Ratio Prot	0.16	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.26	0.30
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.95	0.94	1.01	1.07	0.45	0.24	0.84	0.86	0.07		0.94	0.62
Uniform Delay, d1	45.0	36.4	31.5	46.5	31.2	29.0	48.0	48.2	44.0		39.1	21.0
Progression Factor	1.15	0.80	0.73	1.00	1.00	1.00	1.26	1.26	2.47		0.65	0.94
Incremental Delay, d2	4.1	2.3	13.7	74.0	1.4	1.2	23.7	26.6	0.1		24.9	2.0
Delay (s)	55.9	31.6	36.6	120.5	32.6	30.2	84.3	87.3	108.7		50.2	21.7
Level of Service	E	C	D	F	C	C	F	F	F		D	C
Approach Delay (s)		38.9			59.0			91.8			31.7	
Approach LOS		D			E			F			C	

Intersection Summary			
HCM Average Control Delay	45.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3530			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3530			1863	
Volume (vph)	105	218	1025	51	0	120	0	1238	21	0	283	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1346	23	0	308	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1368	0	0	308	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	8.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.39			0.17	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.84			0.47	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		25.8			27.7	
Progression Factor	1.19	1.19	1.57	1.00		1.00		0.69			1.01	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		4.4			2.3	
Delay (s)	29.8	29.5	40.5	50.9		48.1		22.2			30.4	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.9			48.9			22.2			30.4	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	31.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	75.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3375		1770	3502		1770	1821		1770	1863	1543
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3375		1770	3502		1770	1821		1770	1863	1543
Volume (vph)	66	450	179	37	581	35	193	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	489	195	40	632	38	210	163	24	38	190	97
RTOR Reduction (vph)	0	49	0	0	5	0	0	8	0	0	0	83
Lane Group Flow (vph)	72	635	0	40	665	0	210	179	0	38	190	14
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	3.0	24.8		1.4	23.2		9.6	9.6		9.1	9.1	9.1
Effective Green, g (s)	3.0	24.8		1.4	23.2		9.6	9.6		9.1	9.1	9.1
Actuated g/C Ratio	0.05	0.41		0.02	0.38		0.16	0.16		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	87	1374		41	1334		279	287		264	278	231
v/s Ratio Prot	c0.04	0.19		0.02	c0.19		c0.12	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.83	0.46		0.98	0.50		0.75	0.62		0.14	0.68	0.06
Uniform Delay, d1	28.7	13.2		29.7	14.4		24.5	24.0		22.5	24.5	22.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	44.8	0.2		130.1	0.3		10.9	4.2		0.3	6.8	0.1
Delay (s)	73.5	13.4		159.8	14.7		35.4	28.1		22.8	31.3	22.4
Level of Service	E	B		F	B		D	C		C	C	C
Approach Delay (s)		19.2			22.9			32.0			27.6	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	55.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3461		1770	3515			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3461		1770	3515			1801	1555		1772	
Volume (vph)	18	836	96	152	923	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	909	104	165	1003	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	1006	0	165	1034	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1557		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.29		c0.09	0.29			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.65		0.84	0.53			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.3		43.6	14.3			40.0	36.2		39.7	
Progression Factor	1.06	0.41		0.82	0.65			1.00	1.00		1.00	
Incremental Delay, d2	210.4	1.8		17.8	0.7			7.7	0.2		0.4	
Delay (s)	262.9	10.6		53.7	10.0			47.7	36.3		40.0	
Level of Service	F	B		D	B			D	D		D	
Approach Delay (s)		15.5			16.0			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3077		1770	3390		3433	3501		1770	3282	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3077		1770	3390		3433	3501		1770	3282	
Volume (vph)	166	520	320	69	416	65	461	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	565	348	75	452	71	501	701	27	123	743	200
RTOR Reduction (vph)	0	92	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	821	0	75	511	0	501	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.5		5.2	24.6		16.3	35.5		10.8	30.0	
Effective Green, g (s)	12.6	32.5		4.7	24.6		15.8	36.5		10.3	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.25		0.16	0.36		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	1000		83	834		542	1278		182	1017	
v/s Ratio Prot	c0.10	c0.27		0.04	0.15		c0.15	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.82		0.90	0.61		0.92	0.57		0.68	0.90	
Uniform Delay, d1	42.5	31.1		47.4	33.5		41.5	25.4		43.2	33.1	
Progression Factor	1.14	0.38		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.3	6.3		66.1	3.3		21.3	1.8		7.6	12.8	
Delay (s)	63.9	18.2		113.5	36.8		62.9	27.3		50.8	45.9	
Level of Service	E	B		F	D		E	C		D	D	
Approach Delay (s)		25.7			46.4			41.8			46.4	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
PREFERRED PROJECT ALTERNATIVE
2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3392		1770	3518		1770	3422		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3392		1770	3518		1770	3422		1770	1863	1583
Volume (vph)	514	847	324	104	742	30	117	222	63	61	209	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	341	109	781	32	123	234	66	64	220	208
RTOR Reduction (vph)	0	32	0	0	2	0	0	24	0	0	0	177
Lane Group Flow (vph)	541	1201	0	109	811	0	123	276	0	64	220	31
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	52.6		10.6	28.6		13.2	13.2		16.6	16.6	16.6
Effective Green, g (s)	34.6	53.6		10.6	29.6		13.2	13.2		16.6	16.6	16.6
Actuated g/C Ratio	0.31	0.49		0.10	0.27		0.12	0.12		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1653		171	947		212	411		267	281	239
v/s Ratio Prot	c0.31	0.35		0.06	c0.23		0.07	c0.08		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.73		0.64	0.86		0.58	0.67		0.24	0.78	0.13
Uniform Delay, d1	37.2	22.4		47.8	38.2		45.8	46.3		41.1	45.0	40.5
Progression Factor	1.00	1.00		0.90	1.30		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	2.8		5.6	7.4		3.3	3.9		0.5	13.3	0.3
Delay (s)	68.0	25.2		48.8	57.2		49.1	50.2		41.6	58.2	40.7
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.3			56.2			49.9			48.7	
Approach LOS		D			E			D			D	

Intersection Summary					
HCM Average Control Delay	45.6	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	80.8%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3438		1770	3487		1770	3448	
Flt Permitted	0.21	1.00			0.70		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	386	3453			2430		1770	3487		1770	3448	
Volume (vph)	122	709	137	46	551	123	194	651	71	118	739	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	48	580	129	204	685	75	124	778	162
RTOR Reduction (vph)	0	17	0	0	18	0	0	7	0	0	14	0
Lane Group Flow (vph)	128	873	0	0	739	0	204	753	0	124	926	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	38.1	38.1			38.1		15.2	42.9		16.0	43.7	
Effective Green, g (s)	38.1	38.1			38.1		15.2	43.9		16.0	44.7	
Actuated g/C Ratio	0.35	0.35			0.35		0.14	0.40		0.15	0.41	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	134	1196			842		245	1392		257	1401	
v/s Ratio Prot		0.25					c0.12	0.22		0.07	c0.27	
v/s Ratio Perm	c0.33				0.30							
v/c Ratio	0.96	0.73			0.88		0.83	0.54		0.48	0.66	
Uniform Delay, d1	35.1	31.4			33.8		46.2	25.3		43.2	26.5	
Progression Factor	0.47	0.52			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.4	1.6			10.2		20.8	1.5		1.4	2.5	
Delay (s)	68.9	17.9			44.0		67.0	26.8		44.6	29.0	
Level of Service	E	B			D		E	C		D	C	
Approach Delay (s)		24.4			44.0			35.3			30.8	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	32.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	84	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	88	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	313	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	313	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	92	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	565	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	91	1
Volume Left	0	81	2	0
Volume Right	2	1	88	0
cSH	1545	1616	1066	640
Volume to Capacity	0.00	0.05	0.08	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.6
Approach LOS			A	B

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	27.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Project AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	49	61	5	69	47	112	11	162	65	119	159	90	237	8	25	169	59	10

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	115	228	238	368	245	194	69
Delay	31.3	0.4	18.5	19.5	0.3	36.6	31.5
LOS	C	A	B	B	A	D	C

HCM Average Control Delay	**24.9**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.89			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1857	1583	1770	1761	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1665			1818	1583	1770	1761	
Volume (vph)	49	61	5	69	47	112	11	162	65	119	159	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	64	5	73	49	118	12	171	68	125	167	95
RTOR Reduction (vph)	0	3	0	0	78	0	0	0	47	0	14	0
Lane Group Flow (vph)	52	66	0	73	89	0	0	183	21	125	248	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	6.0	6.0		19.0	19.0			21.3	21.3	7.5	32.8	
Effective Green, g (s)	6.0	6.0		19.0	19.0			21.3	21.3	7.5	32.8	
Actuated g/C Ratio	0.09	0.09		0.27	0.27			0.31	0.31	0.11	0.47	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	152	158		482	453			555	483	190	828	
v/s Ratio Prot	0.03	c0.04		0.04	c0.05					c0.07	c0.14	
v/s Ratio Perm								0.10	0.01			
v/c Ratio	0.34	0.42		0.15	0.20			0.33	0.04	0.66	0.30	
Uniform Delay, d1	30.0	30.2		19.3	19.5			18.7	17.1	29.9	11.4	
Progression Factor	1.00	1.00		0.05	0.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	1.3		0.1	0.1			0.3	0.0	6.1	0.1	
Delay (s)	31.0	31.6		1.1	0.1			19.0	17.1	36.1	11.6	
Level of Service	C	C		A	A			B	B	D	B	
Approach Delay (s)		31.3			0.4			18.5			19.5	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	16.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1751	
Flt Permitted	1.00		0.43	1.00	0.96	
Satd. Flow (perm)	1855		801	1863	1751	
Volume (vph)	237	8	25	169	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	249	8	26	178	62	11
RTOR Reduction (vph)	1	0	0	0	6	0
Lane Group Flow (vph)	256	0	26	178	67	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	56.1		9.3	9.3	5.7	
Effective Green, g (s)	56.1		9.3	9.3	5.7	
Actuated g/C Ratio	0.80		0.13	0.13	0.08	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1491		107	248	143	
v/s Ratio Prot	c0.14			c0.10	c0.04	
v/s Ratio Perm			0.03			
v/c Ratio	0.17		0.24	0.72	0.47	
Uniform Delay, d1	1.6		27.1	29.0	30.6	
Progression Factor	0.18		1.00	1.00	1.00	
Incremental Delay, d2	0.0		0.9	8.9	0.9	
Delay (s)	0.3		28.0	37.9	31.5	
Level of Service	A		C	D	C	
Approach Delay (s)	0.3			36.6	31.5	
Approach LOS	A			D	C	

Intersection Summary				
HCM Average Control Delay	18.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	30.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1823		1770	1850		1770	1825	
Flt Permitted		0.92			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1596			1451		1770	1850		1770	1825	
Volume (vph)	63	79	132	37	68	4	36	293	14	23	443	69
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	66	83	139	39	72	4	38	308	15	24	466	73
RTOR Reduction (vph)	0	67	0	0	2	0	0	3	0	0	9	0
Lane Group Flow (vph)	0	221	0	0	113	0	38	320	0	24	530	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		319			290		85	1003		32	934	
v/s Ratio Prot							c0.02	0.17		0.01	c0.29	
v/s Ratio Perm		c0.14			0.08							
v/c Ratio		0.69			0.39		0.45	0.32		0.75	0.57	
Uniform Delay, d1		18.6			17.3		23.2	6.3		24.4	8.4	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		5.9			0.6		2.7	0.8		62.8	2.5	
Delay (s)		24.4			18.0		23.0	8.2		87.2	10.9	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		24.4			18.0			9.7			14.1	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	83	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	87	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	177	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.16	0.00
Departure Headway (s)	4.3	4.6	4.0	4.3
Degree Utilization, x	0.01	0.09	0.20	0.10
Capacity (veh/h)	785	726	868	809
Control Delay (s)	7.3	8.1	8.0	7.8
Approach Delay (s)	7.3	8.1	8.0	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th St & Shellmound St

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	59	20	18	196	215	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	62	21	19	206	226	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	481	236	246			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	481	236	246			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	97	99			
cM capacity (veh/h)	536	803	1320			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	83	19	206	246
Volume Left	62	19	0	0
Volume Right	21	0	0	20
cSH	586	1320	1700	1700
Volume to Capacity	0.14	0.01	0.12	0.14
Queue Length 95th (ft)	12	1	0	0
Control Delay (s)	12.2	7.8	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.2	0.7		0.0
Approach LOS	B			

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			26.1%	ICU Level of Service A
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1659		1770	3539	1583		3519	
Flt Permitted		0.97	1.00	0.95	0.96		0.52	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1659		969	3539	1583		3301	
Volume (vph)	39	28	117	343	4	29	59	263	136	17	344	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	361	4	31	62	277	143	18	362	9
RTOR Reduction (vph)	0	0	116	0	7	0	0	0	47	0	2	0
Lane Group Flow (vph)	0	70	7	204	185	0	62	277	96	0	387	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.0	15.0		67.6	67.6	67.6		67.6	
Effective Green, g (s)		5.9	5.9	15.0	15.0		67.1	67.1	67.1		67.1	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	252	249		650	2375	1062		2215	
v/s Ratio Prot		c0.04		c0.12	0.11			0.08				
v/s Ratio Perm			0.00				0.06		0.06		c0.12	
v/c Ratio		0.65	0.08	0.81	0.74		0.10	0.12	0.09		0.17	
Uniform Delay, d1		46.1	44.5	41.1	40.7		5.8	5.9	5.8		6.1	
Progression Factor		1.00	1.00	1.54	1.56		0.04	0.05	0.00		1.00	
Incremental Delay, d2		12.1	0.3	16.8	11.1		0.3	0.1	0.1		0.2	
Delay (s)		58.2	44.7	80.0	74.6		0.5	0.4	0.1		6.3	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6			77.4			0.3			6.3	
Approach LOS		D			E			A			A	

Intersection Summary				
HCM Average Control Delay		29.3	HCM Level of Service	C
HCM Volume to Capacity ratio		0.32		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		44.7%	ICU Level of Service	A
Analysis Period (min)		15		

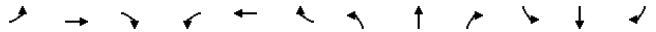
c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	93	43	253	220	84	171
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	45	266	232	88	180
RTOR Reduction (vph)	0	33	0	0	0	162
Lane Group Flow (vph)	98	12	266	232	88	18
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	10.6	28.0	13.9	82.4	65.0	10.6
Effective Green, g (s)	10.1	27.5	13.4	81.9	64.5	10.1
Actuated g/C Ratio	0.10	0.28	0.13	0.82	0.64	0.10
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	179	435	460	1526	1202	160
v/s Ratio Prot	c0.06	0.01	c0.08	c0.12	0.05	0.01
v/s Ratio Perm						
v/c Ratio	0.55	0.03	0.58	0.15	0.07	0.11
Uniform Delay, d1	42.8	26.5	40.6	1.9	6.6	40.9
Progression Factor	0.88	3.06	1.00	0.10	1.00	1.00
Incremental Delay, d2	3.4	0.0	1.7	0.2	0.1	0.3
Delay (s)	40.9	81.0	42.5	0.4	6.7	41.2
Level of Service	D	F	D	A	A	D
Approach Delay (s)	53.5			22.9	29.9	
Approach LOS	D			C	C	

Intersection Summary			
HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1798	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1798	
Volume (vph)	5	21	16	667	79	0	88	87	838	76	236	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	702	83	0	93	92	882	80	248	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	382	403	0	93	92	882	80	312	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.8	2.8	2.8	21.6	21.6		4.5	15.9	60.1	4.3	15.7	
Effective Green, g (s)	2.3	2.3	2.3	21.6	21.6		4.0	16.4	60.1	3.8	16.2	
Actuated g/C Ratio	0.04	0.04	0.04	0.36	0.36		0.07	0.27	1.00	0.06	0.27	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	68	71	61	604	612		118	966	1583	112	485	
v/s Ratio Prot	0.00	0.01		0.23	0.24		0.05	0.03		0.05	0.17	
v/s Ratio Perm			0.00						c0.56			
v/c Ratio	0.07	0.31	0.01	0.63	0.66		0.79	0.10	0.56	0.71	0.64	
Uniform Delay, d1	27.9	28.1	27.8	16.0	16.2		27.6	16.3	0.0	27.6	19.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	1.9	2.3		26.6	0.0	1.4	16.4	2.6	
Delay (s)	28.0	29.0	27.8	17.9	18.4		54.2	16.3	1.4	44.0	22.0	
Level of Service	C	C	C	B	B		D	B	A	D	C	
Approach Delay (s)		28.5			18.2			7.3			26.4	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	0.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3390	1441				3433		1583
Volume (vph)	119	216	190	0	691	1005	0	0	0	776	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1058	0	0	0	817	0	136
RTOR Reduction (vph)	0	72	0	0	0	0	0	0	0	0	0	98
Lane Group Flow (vph)	125	355	0	0	727	1058	0	0	0	817	0	38
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	64.1			41.1	100.0				27.4		27.4
Effective Green, g (s)	19.0	64.1			41.1	100.0				27.9		27.9
Actuated g/C Ratio	0.19	0.64			0.41	1.00				0.28		0.28
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2110			1393	1441				958		442
v/s Ratio Prot	0.07	0.11			0.21					c0.24		
v/s Ratio Perm						c0.73						0.02
v/c Ratio	0.37	0.17			0.52	0.73				0.85		0.09
Uniform Delay, d1	35.3	7.2			22.1	0.0				34.1		26.6
Progression Factor	1.00	1.00			0.71	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.9				7.3		0.1
Delay (s)	35.6	7.4			16.4	1.9				41.5		26.7
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.8			7.8			0.0			39.3	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	17.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	68.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1466	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1466	1504			
Volume (vph)	74	918	0	0	1085	349	611	2	1146	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	966	0	0	1142	367	643	2	1206	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	250	0	84	39	0	0	0
Lane Group Flow (vph)	78	966	0	0	1142	117	555	570	604	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	557	677			
v/s Ratio Prot	0.04	c0.19			c0.25		0.33	c0.39	c0.40			
v/s Ratio Perm						0.07						
v/c Ratio	0.24	0.40			0.77	0.23	0.87	1.02	0.89			
Uniform Delay, d1	35.2	17.3			30.7	25.0	28.7	31.0	25.3			
Progression Factor	0.63	0.50			0.49	0.28	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.4			3.0	0.8	12.3	44.0	14.3			
Delay (s)	23.7	9.1			17.9	7.9	41.0	75.0	39.5			
Level of Service	C	A			B	A	D	E	D			
Approach Delay (s)		10.2			15.5			52.5			0.0	
Approach LOS		B			B			D			A	

Intersection Summary				
HCM Average Control Delay	29.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1792	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1792	2628
Volume (vph)	388	1306	370	75	743	80	42	3	42	168	45	656
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	408	1375	389	79	782	84	44	3	44	177	47	691
RTOR Reduction (vph)	0	0	188	0	0	16	0	0	41	0	0	194
Lane Group Flow (vph)	408	1375	201	79	782	68	23	24	3	0	224	497
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.3	41.0	52.2	6.8	26.5	26.5	7.7	7.7	7.7		30.5	50.8
Effective Green, g (s)	19.8	40.5	51.7	6.3	27.0	27.0	7.2	7.2	7.2		30.0	49.8
Actuated g/C Ratio	0.20	0.40	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	680	1373	745	112	956	427	121	122	114		538	1309
v/s Ratio Prot	0.12	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.13	0.19
v/s Ratio Perm						0.04			0.00			
v/c Ratio	0.60	1.00	0.27	0.71	0.82	0.16	0.19	0.20	0.03		0.42	0.38
Uniform Delay, d1	36.5	29.8	13.6	45.9	34.2	27.8	43.7	43.7	43.1		28.0	15.5
Progression Factor	1.14	0.57	0.41	1.00	1.00	1.00	1.00	1.00	1.00		1.20	0.95
Incremental Delay, d2	2.7	20.5	0.1	15.2	7.7	0.8	0.6	0.6	0.1		2.2	0.8
Delay (s)	44.3	37.4	5.6	61.1	41.9	28.6	44.2	44.3	43.2		35.8	15.6
Level of Service	D	D	A	E	D	C	D	D	D		D	B
Approach Delay (s)		33.0			42.4			43.7			20.5	
Approach LOS		C			D			D			C	

Intersection Summary					
HCM Average Control Delay	32.6	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	257	0	0	0	0	478	9	0	132	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	503	9	0	139	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	511	0	0	139	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.6					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.14			0.07	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.22			0.13	
Uniform Delay, d1	26.8	26.8	21.2					7.4			10.5	
Progression Factor	0.95	0.95	0.76					1.00			0.94	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.3	
Delay (s)	25.6	25.5	16.2					7.6			10.2	
Level of Service	C	C	B					A			B	
Approach Delay (s)		18.5			0.0			7.6			10.2	
Approach LOS		B			A			A			B	

Intersection Summary					
HCM Average Control Delay	11.8	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.19				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3341		1770	3479		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3341		1770	3479		1770	1832		1770	1863	1583
Volume (vph)	393	445	265	36	476	61	241	210	26	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	468	279	38	501	64	254	221	27	29	212	108
RTOR Reduction (vph)	0	70	0	0	10	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	677	0	38	555	0	254	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	28.0	44.8		5.7	22.5		18.5	18.5		16.0	16.0	16.0
Effective Green, g (s)	27.5	45.3		5.2	23.0		18.0	18.0		15.5	15.5	15.5
Actuated g/C Ratio	0.28	0.45		0.05	0.23		0.18	0.18		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	487	1513		92	800		319	330		274	289	245
v/s Ratio Prot	c0.23	0.20		0.02	c0.16		c0.14	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.45		0.41	0.69		0.80	0.74		0.11	0.73	0.07
Uniform Delay, d1	34.3	18.8		45.9	35.3		39.2	38.8		36.3	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.97	0.97		0.81	0.85	1.27
Incremental Delay, d2	13.3	1.0		3.0	4.9		12.9	8.3		0.2	9.0	0.1
Delay (s)	47.6	19.7		48.9	40.2		51.0	45.9		29.6	43.3	45.8
Level of Service	D	B		D	D		D	D		C	D	D
Approach Delay (s)		29.7			40.7			48.5			42.9	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM Average Control Delay	37.6	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	74.1%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3372		1770	3513		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3372		1770	3513		1770	3487		1770	3497	
Volume (vph)	94	263	121	100	418	22	127	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	277	127	105	440	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	58	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	346	0	105	459	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	17.8		9.3	19.2		12.6	50.7		7.2	45.3	
Effective Green, g (s)	6.9	18.3		8.3	19.7		11.6	51.2		6.2	45.8	
Actuated g/C Ratio	0.07	0.18		0.08	0.20		0.12	0.51		0.06	0.46	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	617		147	692		205	1785		110	1602	
v/s Ratio Prot	0.06	0.10		c0.06	c0.13		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.56		0.71	0.66		0.65	0.35		0.47	0.54	
Uniform Delay, d1	45.9	37.2		44.7	37.1		42.3	14.5		45.3	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.2		15.2	2.4		7.3	0.5		3.2	1.3	
Delay (s)	78.0	38.4		59.9	39.5		49.6	15.1		48.5	20.8	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		46.2			43.3			21.1			22.4	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	30.6	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3425		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3425		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	274	75	43	347	177	66	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	288	79	45	365	186	69	165	32	26	53	9
RTOR Reduction (vph)	0	15	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	352	0	45	365	101	69	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		5.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1781		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	0.10		c0.03	c0.10		0.04	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.20		0.53	0.19	0.12	0.27	0.73			0.35	
Uniform Delay, d1	48.1	12.8		46.5	11.7	11.2	38.3	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.0	0.2		4.5	0.2	0.3	0.4	9.6			0.7	
Delay (s)	58.1	13.1		51.0	11.9	11.5	38.7	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		16.0			14.7			47.6			40.3	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	23.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.31				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	45.9%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3437		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3437		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	62	52	527	174	132	255	39	120	184	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	65	55	555	183	139	268	41	126	194	11
RTOR Reduction (vph)	0	16	0	0	0	93	0	0	32	0	2	0
Lane Group Flow (vph)	29	321	0	55	555	90	139	268	9	126	203	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.6		7.0	49.1	49.1	12.1	23.4	23.4	8.5	19.8	
Effective Green, g (s)	4.0	46.6		6.5	49.1	49.1	11.6	22.9	22.9	8.0	19.3	
Actuated g/C Ratio	0.04	0.47		0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1602		115	1738	777	205	427	363	142	357	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		0.08	c0.14		c0.07	0.11	
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.12	0.68	0.63	0.03	0.89	0.57	
Uniform Delay, d1	46.8	15.7		45.1	15.4	13.7	42.4	34.7	29.9	45.6	36.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.03	0.83	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.3	7.8	2.5	0.0	42.5	1.6	
Delay (s)	49.6	16.0		47.4	15.8	14.0	50.2	37.2	29.9	89.6	32.1	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		18.7			17.6			40.6			54.0	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	29.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.45				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	52.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	375	16	90	733	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	395	17	95	772	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	794			412			1032	1437	206	1305	1434	397
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	794			412			1032	1437	206	1305	1434	397
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			84	88	90	98	97	100
cM capacity (veh/h)	823			1144			168	118	801	89	118	603

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	263	148	95	514	279	34	85	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	823	1700	1700	1144	1700	1700	154	545	121
Volume to Capacity	0.03	0.15	0.09	0.08	0.30	0.16	0.22	0.16	0.05
Queue Length 95th (ft)	2	0	0	7	0	0	20	14	4
Control Delay (s)	9.5	0.0	0.0	8.4	0.0	0.0	34.8	12.8	36.4
Lane LOS	A			A			D	B	E
Approach Delay (s)	0.6			0.9			19.2		36.4
Approach LOS							C		E

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	38.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3471		1770	3497			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3471		1770	3497			1805	1583		1545	
Volume (vph)	3	386	57	122	614	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	406	60	128	646	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	458	0	128	698	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1701		191	2077			310	272		108	
v/s Ratio Prot	0.00	c0.13		c0.07	c0.20			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.27		0.67	0.34			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.0		42.9	10.3			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.4	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.4		54.1	7.4			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.8			14.6			46.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	51.4%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3365		1770	3385		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3365		1770	3385		3433	3534		1770	3508	
Volume (vph)	92	284	139	32	437	179	292	785	8	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	299	146	34	460	188	307	826	8	168	917	57
RTOR Reduction (vph)	0	67	0	0	45	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	378	0	34	603	0	307	833	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.6	21.6		8.5	21.5		15.0	43.6		13.3	41.9	
Effective Green, g (s)	7.6	20.6		7.5	20.5		14.0	43.6		12.3	41.9	
Actuated g/C Ratio	0.08	0.21		0.08	0.20		0.14	0.44		0.12	0.42	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	135	693		133	694		481	1541		218	1470	
v/s Ratio Prot	c0.05	0.11		0.02	c0.18		c0.09	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.72	0.55		0.26	0.87		0.64	0.54		0.77	0.66	
Uniform Delay, d1	45.2	35.5		43.6	38.5		40.6	20.8		42.5	23.3	
Progression Factor	1.31	1.03		1.14	1.09		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.8	0.7		0.4	10.5		2.0	1.4		14.2	2.3	
Delay (s)	72.9	37.4		50.1	52.6		42.7	22.2		56.6	25.7	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.7			52.4			27.7			30.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3501		1770	3495			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3501		1770	3495			3172			2914	
Volume (vph)	50	380	29	78	556	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	400	31	82	585	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	421	0	82	627	0	0	195	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	25.9		3.9	26.9			9.2			9.2	
Effective Green, g (s)	2.4	25.9		3.4	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1814		120	1880			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.18							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.62	0.23		0.68	0.33			0.35			0.71	
Uniform Delay, d1	23.4	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.72	1.32		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.9	0.3		12.1	0.5			0.4			4.7	
Delay (s)	25.6	9.0		34.8	7.0			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		10.8			10.2			18.6			24.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	222	57	2	8	78	26	2	1	2	16	4	138
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	234	60	2	8	82	27	2	1	2	17	4	145

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	234	62	118	5	166
Volume Left (vph)	234	0	8	2	17
Volume Right (vph)	0	2	27	2	145
Hadj (s)	0.53	0.01	-0.09	-0.13	-0.47
Departure Headway (s)	5.6	5.0	4.7	5.0	4.5
Degree Utilization, x	0.36	0.09	0.15	0.01	0.21
Capacity (veh/h)	624	691	727	645	746
Control Delay (s)	10.4	7.3	8.5	8.1	8.6
Approach Delay (s)	9.8		8.5	8.1	8.6
Approach LOS	A		A	A	A

Intersection Summary				
Delay	9.2			
HCM Level of Service	A			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary					
HCM Average Control Delay	14.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	56.6	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	49.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3503			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3503			3490	
Volume (vph)	60	193	12	111	256	20	0	999	72	0	949	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1052	76	0	999	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1124	0	0	1094	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.32			0.31	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.54			0.53	
Uniform Delay, d1		43.9			42.1			12.7			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.0			1.0	
Delay (s)		52.4			46.5			13.7			13.6	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.7			13.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3260			5076	
Volume (vph)	0	0	0	65	461	718	12	504	0	0	993	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	531	0	0	1045	13
RTOR Reduction (vph)	0	0	0	0	0	200	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	556	0	544	0	0	1057	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					35.9	35.9		55.1			55.1	
Effective Green, g (s)					35.9	35.9		56.1			56.1	
Actuated g/C Ratio					0.36	0.36		0.56			0.56	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1263	568		1829			2848	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.35		0.17				
v/c Ratio					0.44	0.98		0.30			0.37	
Uniform Delay, d1					24.4	31.7		11.6			12.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	31.9		0.4			0.4	
Delay (s)					24.5	63.6		12.0			12.5	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			47.1			12.0			12.5	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3487		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3487		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	498	54	434	592	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	524	57	457	623	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	572	0	457	623	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	48.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		661						1604		613	2462	
v/s Ratio Prot		c0.13						c0.16		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.36		0.75	0.25	
Uniform Delay, d1		26.3						12.2		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.6		4.3	0.0	
Delay (s)		28.4						12.8		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			12.8			15.6	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3425		1770	3503		1770	3420		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3425		1770	3503		1770	3420		1770	1863	1583
Volume (vph)	290	760	208	139	862	64	186	445	129	139	309	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	219	146	907	67	196	468	136	146	325	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	25	0	0	0	305
Lane Group Flow (vph)	305	997	0	146	969	0	196	579	0	146	325	204
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.3		12.6	30.8		19.9	19.9		21.2	21.2	21.2
Effective Green, g (s)	21.1	40.3		12.6	31.8		19.9	19.9		21.2	21.2	21.2
Actuated g/C Ratio	0.19	0.37		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1255		203	1013		320	619		341	359	305
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.11	c0.17		0.08	c0.17	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.79		0.72	0.96		0.61	0.94		0.43	0.91	0.67
Uniform Delay, d1	43.4	31.1		47.0	38.4		41.5	44.4		39.1	43.4	41.1
Progression Factor	1.00	1.00		1.18	0.96		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.2		4.3	9.4		2.4	18.3		0.9	25.3	5.5
Delay (s)	68.2	36.4		59.9	46.4		43.8	63.1		39.9	68.7	46.6
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		43.7			48.1			58.4			52.9	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	49.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3438		1770	3497		1770	3448	
Flt Permitted	0.19	1.00			0.73		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	356	3385			2532		1770	3497		1770	3448	
Volume (vph)	198	635	260	55	665	148	270	1069	91	186	979	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	58	700	156	284	1125	96	196	1031	213
RTOR Reduction (vph)	0	41	0	0	16	0	0	5	0	0	16	0
Lane Group Flow (vph)	208	901	0	0	898	0	284	1216	0	196	1228	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	155	1477			1105		274	1113		241	1034	
v/s Ratio Prot		0.27					0.16	c0.35		0.11	c0.36	
v/s Ratio Perm	c0.58				0.35							
v/c Ratio	1.34	0.61			0.81		1.04	1.09		0.81	1.19	
Uniform Delay, d1	31.0	23.8			27.1		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	180.3	0.5			4.7		64.2	55.7		18.5	94.3	
Delay (s)	214.3	26.8			31.7		110.7	93.2		64.7	132.8	
Level of Service	F	C			C		F	F		E	F	
Approach Delay (s)		60.7			31.7			96.5			123.5	
Approach LOS		E			C			F			F	

Intersection Summary				
HCM Average Control Delay	84.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	112.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	144	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	152	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			342	341	20	493	341	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	493	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	86	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	386	526	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	168	155	2
Volume Left	1	151	2	1
Volume Right	0	0	152	0
cSH	1599	1596	1038	445
Volume to Capacity	0.00	0.09	0.15	0.00
Queue Length 95th (ft)	0	8	13	0
Control Delay (s)	0.4	6.8	9.1	13.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.1	13.1
Approach LOS			A	B

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	31.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Project PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	103	79	6	165	106	227	10	445	229	89	231	66	380	16	33	384	114	20

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	188	498	684	386	396	417	134
Delay	48.9	0.8	51.8	30.6	1.1	66.8	53.2
LOS	D	A	D	C	A	E	D

HCM Average Control Delay	**50.5**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.95			1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.90			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1835		1770	1586			1861	1583	1770	1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1835		1770	1586			1844	1583	1770	1774	
Volume (vph)	103	79	6	165	106	227	10	445	229	89	231	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	83	6	174	112	239	11	468	241	94	243	69
RTOR Reduction (vph)	0	2	0	0	62	0	0	0	152	0	8	0
Lane Group Flow (vph)	108	87	0	174	289	0	0	479	89	94	304	0
Confl. Peds. (#/hr)			20			20						20
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	11.4	11.4		41.8	41.8			30.3	30.3	9.5	43.8	
Effective Green, g (s)	11.4	11.4		41.8	41.8			30.3	30.3	9.5	43.8	
Actuated g/C Ratio	0.10	0.10		0.38	0.38			0.28	0.28	0.09	0.40	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	185	192		679	608			513	440	154	713	
v/s Ratio Prot	c0.06	0.05		0.10	c0.18					c0.05	0.17	
v/s Ratio Perm								c0.26	0.06			
v/c Ratio	0.58	0.45		0.26	0.48			0.93	0.20	0.61	0.43	
Uniform Delay, d1	46.5	45.9		23.0	25.3			38.4	30.1	48.0	23.5	
Progression Factor	1.00	1.00		0.04	0.02			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.9	1.2		0.0	0.1			24.2	0.2	5.0	0.3	
Delay (s)	50.4	47.1		0.9	0.7			62.6	30.3	52.9	23.8	
Level of Service	D	D		A	A			E	C	D	C	
Approach Delay (s)		48.9			0.8			51.8			30.6	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	32.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1850		1770	1863	1731	
Flt Permitted	1.00		0.16	1.00	0.96	
Satd. Flow (perm)	1850		296	1863	1731	
Volume (vph)	380	16	33	384	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	17	35	404	120	21
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	416	0	35	404	136	0
Confl. Peds. (#/hr)		20				20
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	88.4		25.2	25.2	12.6	
Effective Green, g (s)	88.4		25.2	25.2	12.6	
Actuated g/C Ratio	0.81		0.23	0.23	0.12	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1500		68	431	200	
v/s Ratio Prot	c0.22			c0.22	c0.08	
v/s Ratio Perm			0.12			
v/c Ratio	0.28		0.51	0.94	0.68	
Uniform Delay, d1	2.5		36.6	41.1	46.3	
Progression Factor	0.40		1.00	1.00	1.00	
Incremental Delay, d2	0.1		4.8	27.9	7.0	
Delay (s)	1.1		41.4	69.0	53.2	
Level of Service	A		D	E	D	
Approach Delay (s)	1.1			66.8	53.2	
Approach LOS	A			E	D	

Intersection Summary				
HCM Average Control Delay	37.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1773			1805		1770	1842		1770	1747	
Flt Permitted		0.81			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1460			1582		1770	1842		1770	1747	
Volume (vph)	160	210	68	36	116	20	163	657	44	19	354	181
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	221	72	38	122	21	172	692	46	20	373	191
RTOR Reduction (vph)	0	12	0	0	9	0	0	4	0	0	34	0
Lane Group Flow (vph)	0	449	0	0	172	0	172	734	0	20	530	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		425			460		222	874		29	638	
v/s Ratio Prot							c0.10	c0.40		0.01	0.30	
v/s Ratio Perm		c0.31			0.11							
v/c Ratio		1.06			0.37		0.77	0.84		0.69	0.83	
Uniform Delay, d1		19.5			15.5		23.3	12.6		26.9	15.9	
Progression Factor		1.00			1.00		0.91	1.06		0.99	1.04	
Incremental Delay, d2		59.3			0.4		13.1	8.4		40.7	10.1	
Delay (s)		78.8			15.9		34.3	21.8		67.3	26.6	
Level of Service		E			B		C	C		E	C	
Approach Delay (s)		78.8			15.9			24.1			28.0	
Approach LOS		E			B			C			C	

Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	148	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	156	71	5	146	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	119	244	153
Volume Left (vph)	4	107	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.12	0.04
Departure Headway (s)	4.6	5.1	4.5	4.7
Degree Utilization, x	0.10	0.17	0.30	0.20
Capacity (veh/h)	703	648	767	714
Control Delay (s)	8.1	9.1	9.4	8.9
Approach Delay (s)	8.1	9.1	9.4	8.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	58	34	19	616	312	94
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	36	20	648	328	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	1066	378	427			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1066	378	427			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	95	98			
cM capacity (veh/h)	242	669	1132			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	97	20	648	427
Volume Left	61	20	0	0
Volume Right	36	0	0	99
cSH	316	1132	1700	1700
Volume to Capacity	0.31	0.02	0.38	0.25
Queue Length 95th (ft)	32	1	0	0
Control Delay (s)	21.3	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	21.3	0.2		0.0
Approach LOS	C			

Intersection Summary				
Average Delay			1.9	
Intersection Capacity Utilization			44.4%	ICU Level of Service A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1650		1770	3539	1452		3460	
Flt Permitted		0.97	1.00	0.95	0.97		0.38	1.00	1.00		0.92	
Satd. Flow (perm)		1798	1583	1681	1650		711	3539	1452		3202	
Volume (vph)	12	5	95	584	63	53	137	402	230	22	397	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	615	66	56	144	423	242	23	418	63
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	149	0	10	0
Lane Group Flow (vph)	0	18	6	378	353	0	144	423	93	0	494	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	741		273	1358	557		1228	
v/s Ratio Prot		c0.01		c0.22	0.21			0.12				
v/s Ratio Perm			0.00				c0.20		0.06		0.15	
v/c Ratio		0.17	0.06	0.50	0.48		0.53	0.31	0.17		0.40	
Uniform Delay, d1		49.3	49.0	21.5	21.2		26.2	23.7	22.3		24.7	
Progression Factor		1.00	1.00	0.27	0.25		0.99	0.84	1.40		1.00	
Incremental Delay, d2		0.6	0.2	2.2	2.0		3.4	0.3	0.3		1.0	
Delay (s)		49.8	49.2	8.0	7.3		29.4	20.1	31.5		25.7	
Level of Service		D	D	A	A		C	C	C		C	
Approach Delay (s)		49.3			7.7			25.2			25.7	
Approach LOS		D			A			C			C	

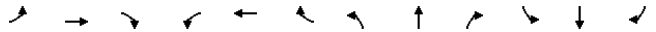
Intersection Summary				
HCM Average Control Delay		20.7	HCM Level of Service	C
HCM Volume to Capacity ratio		0.49		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		64.0%	ICU Level of Service	B
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	213	37	447	679	206	254
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	224	39	471	715	217	267
RTOR Reduction (vph)	0	22	0	0	0	154
Lane Group Flow (vph)	224	17	471	715	217	113
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.2	47.2	24.5	83.8	55.8	19.2
Effective Green, g (s)	18.7	46.7	24.0	83.3	55.3	18.7
Actuated g/C Ratio	0.17	0.42	0.22	0.76	0.50	0.17
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	301	672	749	1411	937	269
v/s Ratio Prot	c0.13	0.01	c0.14	c0.38	0.12	0.07
v/s Ratio Perm						
v/c Ratio	0.74	0.02	0.63	0.51	0.23	0.42
Uniform Delay, d1	43.4	18.4	39.0	5.3	15.4	40.8
Progression Factor	0.61	0.13	0.96	0.16	1.00	1.00
Incremental Delay, d2	9.2	0.0	1.4	1.1	0.6	1.1
Delay (s)	35.8	2.5	39.0	1.9	16.0	41.8
Level of Service	D	A	D	A	B	D
Approach Delay (s)	30.8			16.7	30.2	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Volume (vph)	172	370	60	623	14	0	11	688	1287	269	557	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	656	15	0	12	724	1355	283	586	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	328	343	0	12	724	1355	283	633	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	21.4	21.4		1.2	23.6	94.4	17.6	40.0	
Effective Green, g (s)	15.8	15.8	15.8	21.4	21.4		0.7	24.1	94.4	17.1	40.5	
Actuated g/C Ratio	0.17	0.17	0.17	0.23	0.23		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	296	312	265	381	383		13	903	1583	321	784	
v/s Ratio Prot	0.10	c0.21		0.20	0.20		0.01	0.20		0.16	0.35	
v/s Ratio Perm			0.03						c0.86			
v/c Ratio	0.61	1.25	0.17	0.86	0.90		0.92	0.80	0.86	0.88	0.81	
Uniform Delay, d1	36.5	39.3	33.7	35.1	35.4		46.8	32.9	0.0	37.7	23.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	135.0	0.1	17.5	22.4		205.3	5.0	6.2	22.9	5.9	
Delay (s)	39.1	174.3	33.8	52.6	57.8		252.1	38.0	6.2	60.6	29.5	
Level of Service	D	F	C	D	E		F	D	A	E	C	
Approach Delay (s)		121.7			55.3			18.6			39.1	
Approach LOS		F			E			B			D	

Intersection Summary				
HCM Average Control Delay	43.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2963	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2963	1399				3433		1583
Volume (vph)	140	403	575	0	522	1746	0	0	0	952	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	1838	0	0	0	1002	0	347
RTOR Reduction (vph)	0	229	0	0	202	0	0	0	0	0	0	192
Lane Group Flow (vph)	147	800	0	0	1033	1152	0	0	0	1002	0	155
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.2			43.2	110.0				34.3		34.3
Effective Green, g (s)	20.0	67.2			43.2	110.0				34.8		34.8
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1971			1164	1399				1086		501
v/s Ratio Prot	0.08	0.25			0.35							0.10
v/s Ratio Perm						c0.82				c0.29		
v/c Ratio	0.46	0.41			0.89	0.82				0.92		0.31
Uniform Delay, d1	40.2	11.1			31.1	0.0				36.3		28.5
Progression Factor	1.00	1.00			0.69	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.1	0.5				12.6		0.3
Delay (s)	40.5	11.7			22.6	0.5				48.9		28.7
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.3			11.9			0.0			43.8	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	80.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1514	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1514	659			
Volume (vph)	142	1212	0	0	1698	410	571	226	1113	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1276	0	0	1787	432	601	238	1172	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	270	0	80	8	0	0	0
Lane Group Flow (vph)	149	1276	0	0	1787	162	601	744	578	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	509	335			
v/s Ratio Prot	0.08	c0.36			c0.39		0.36	0.49	c0.88			
v/s Ratio Perm						0.12						
v/c Ratio	0.44	0.86			1.06	0.33	1.06	1.46	1.72			
Uniform Delay, d1	39.3	29.0			35.0	25.3	36.5	36.5	27.0			
Progression Factor	1.55	0.37			0.94	1.67	1.00	1.00	1.00			
Incremental Delay, d2	2.6	4.2			33.7	0.8	55.9	218.2	338.3			
Delay (s)	63.6	14.9			66.5	43.1	92.4	254.7	365.3			
Level of Service	E	B			E	D	F	F	F			
Approach Delay (s)		20.0			62.0			238.4			0.0	
Approach LOS		C			E			F			A	

Intersection Summary				
HCM Average Control Delay	114.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.45			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1810	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1810	2628
Volume (vph)	525	1021	779	325	1174	255	132	16	66	232	163	694
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	553	1075	820	342	1236	268	139	17	69	244	172	731
RTOR Reduction (vph)	0	3	135	0	0	29	0	0	60	0	0	86
Lane Group Flow (vph)	553	1121	636	342	1236	239	76	80	9	0	416	645
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	0.16	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.23	0.25
v/s Ratio Perm						0.15			0.01			
v/c Ratio	1.04	1.11	1.13	1.25	1.16	0.50	0.36	0.37	0.04		0.84	0.57
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	31.7	43.9	44.0	42.1		37.8	23.9
Progression Factor	1.21	1.03	1.09	1.06	1.06	1.13	1.02	1.03	2.10		0.94	0.67
Incremental Delay, d2	24.5	51.6	58.9	133.2	82.1	2.9	0.7	0.7	0.1		14.6	1.9
Delay (s)	80.7	91.4	91.1	182.4	123.1	38.7	45.6	45.8	88.7		49.9	18.0
Level of Service	F	F	F	F	F	D	D	D	F		D	B
Approach Delay (s)		88.9			121.8			58.9			29.6	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	86.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3526			1863	
Volume (vph)	121	156	824	0	0	0	0	1104	25	0	243	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1162	26	0	256	0
RTOR Reduction (vph)	0	0	246	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	197	621	0	0	0	0	1187	0	0	256	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.22					c0.34			0.14	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.37					0.57			0.42	
Uniform Delay, d1	25.4	25.4	11.3					14.2			28.9	
Progression Factor	1.26	1.24	2.34					1.00			1.31	
Incremental Delay, d2	0.6	0.3	0.1					1.2			2.1	
Delay (s)	32.7	31.8	26.6					15.3			39.8	
Level of Service	C	C	C					B			D	
Approach Delay (s)		28.0			0.0			15.3			39.8	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	23.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3380		1770	3479		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3380		1770	3479		1770	1846		1770	1863	1539
Volume (vph)	190	789	233	20	706	56	504	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	831	245	21	743	59	531	537	28	72	256	160
RTOR Reduction (vph)	0	24	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1052	0	21	796	0	531	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	949		34	727		677	707		304	320	264
v/s Ratio Prot	0.11	c0.31		0.01	c0.23		0.30	c0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.11		0.62	1.10		0.78	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.6		53.6	43.5		29.9	30.2		39.3	43.7	38.4
Progression Factor	1.28	0.92		1.00	1.00		1.01	1.01		1.24	1.19	2.48
Incremental Delay, d2	147.9	62.8		29.0	62.5		5.8	6.1		0.4	12.3	0.2
Delay (s)	211.9	99.1		82.5	106.0		36.0	36.4		49.0	64.1	95.6
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		116.8			105.4			36.2			72.2	
Approach LOS		F			F			D			E	

Intersection Summary				
HCM Average Control Delay	84.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3417		1770	3479		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3417		1770	3479		1770	3491		1770	3477	
Volume (vph)	151	651	194	102	474	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	685	204	107	499	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	31	0	0	11	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	858	0	107	552	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.9		8.3	22.5		12.9	31.9		9.9	28.9	
Effective Green, g (s)	9.7	25.4		7.3	23.0		11.9	32.4		8.9	29.4	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	964		144	889		234	1257		175	1136	
v/s Ratio Prot	c0.09	c0.25		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.89		0.74	0.62		0.80	1.11		0.67	1.10	
Uniform Delay, d1	39.4	31.0		40.4	29.6		37.9	28.8		39.2	30.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	10.3		18.6	1.4		17.8	62.7		9.8	57.0	
Delay (s)	64.8	41.3		59.0	31.0		55.7	91.5		49.0	87.3	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		44.9			35.5			87.3			84.0	
Approach LOS		D			D			F			F	

Intersection Summary				
HCM Average Control Delay	69.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3396		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3396		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	659	199	80	674	55	220	132	124	96	182	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	694	209	84	709	58	232	139	131	101	192	20
RTOR Reduction (vph)	0	23	0	0	0	34	0	38	0	0	2	0
Lane Group Flow (vph)	27	880	0	84	709	24	232	232	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	38.8		7.6	42.2	42.2	18.1	18.1			21.0	
Effective Green, g (s)	3.7	38.8		7.1	42.2	42.2	17.6	17.6			20.5	
Actuated g/C Ratio	0.04	0.39		0.07	0.42	0.42	0.18	0.18			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1318		126	1493	643	312	298			372	
v/s Ratio Prot	0.02	c0.26		c0.05	c0.20		0.13	c0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.67		0.67	0.47	0.04	0.74	0.78			0.83	
Uniform Delay, d1	47.1	25.3		45.3	20.9	17.0	39.1	39.3			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	2.7		11.4	1.1	0.1	8.8	11.7			14.6	
Delay (s)	50.2	28.0		56.7	22.0	17.1	47.8	51.0			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		28.6			25.1			49.5			52.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	34.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3436		1770	3539	1495	1770	1863	1520	1770	1824	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3436		1770	3539	1495	1770	1863	1520	1770	1824	
Volume (vph)	46	674	127	141	583	211	210	326	133	243	428	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	134	148	614	222	221	343	140	256	451	54
RTOR Reduction (vph)	0	15	0	0	0	136	0	0	100	0	4	0
Lane Group Flow (vph)	48	828	0	148	614	86	221	343	40	256	501	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.2		11.9	38.8	38.8	12.5	28.9	28.9	12.5	28.9	
Effective Green, g (s)	4.8	32.2		11.4	38.8	38.8	12.0	28.4	28.4	12.0	28.4	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.28	0.28	0.12	0.28	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1106		202	1373	580	212	529	432	212	518	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.12	0.18		c0.14	c0.27	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.75		0.73	0.45	0.15	1.04	0.65	0.09	1.21	0.97	
Uniform Delay, d1	46.6	30.3		42.8	22.7	19.9	44.0	31.4	26.3	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.95	
Incremental Delay, d2	6.8	4.7		12.2	1.1	0.5	73.4	2.4	0.1	125.9	28.7	
Delay (s)	53.4	34.9		55.0	23.7	20.4	117.4	33.8	26.4	168.9	62.2	
Level of Service	D	C		D	C	C	F	C	C	F	E	
Approach Delay (s)		35.9			27.7			58.6			98.1	
Approach LOS		D			C			E			F	

Intersection Summary				
HCM Average Control Delay	52.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	974	44	96	933	12	33	12	98	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1025	46	101	982	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	995			1072			1802	2292	536	1859	2308	497
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	995			1072			1802	2292	536	1859	2308	497
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	60	79	100	73	98
cM capacity (veh/h)	691			646			33	32	489	21	31	518

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	684	388	101	655	340	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	691	1700	1700	646	1700	1700	33	266	61
Volume to Capacity	0.03	0.40	0.23	0.16	0.39	0.20	1.24	0.41	0.29
Queue Length 95th (ft)	3	0	0	14	0	0	111	48	26
Control Delay (s)	10.4	0.0	0.0	11.6	0.0	0.0	419.4	27.7	86.5
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			134.5		86.5
Approach LOS							F		F

Intersection Summary				
Average Delay	9.8			
Intersection Capacity Utilization	52.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3427		1770	3489			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3427		1770	3489			1809	1555		1813	
Volume (vph)	30	924	159	158	850	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	973	167	166	895	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1128	0	166	951	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1220		221	1392			385	331		265	
v/s Ratio Prot	0.02	c0.33		0.09	c0.27			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.92		0.75	0.68			0.87	0.27		0.71	
Uniform Delay, d1	42.9	30.9		42.2	24.8			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	13.1		1.3	0.3			18.9	0.3		8.2	
Delay (s)	43.5	44.0		50.7	15.6			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		44.0			20.8			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	36.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3299		1770	3372		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3299		1770	3372		3433	3531		1770	3479	
Volume (vph)	207	670	363	47	485	180	484	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	705	382	49	511	189	509	1266	16	281	1236	107
RTOR Reduction (vph)	0	71	0	0	38	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1016	0	49	662	0	509	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	937		81	641		446	1285		258	1322	
v/s Ratio Prot	c0.12	c0.31		0.03	0.20		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.08		0.60	1.03		1.14	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.60	0.85		1.02	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.8	48.5		7.9	42.9		87.3	24.4		81.9	27.5	
Delay (s)	42.3	79.1		55.4	80.9		130.8	56.2		124.6	58.5	
Level of Service	D	E		E	F		F	E		F	E	
Approach Delay (s)		73.0			79.2			77.4			70.0	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM Average Control Delay	74.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3450			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3450			3117			2416	
Volume (vph)	22	814	17	45	570	97	19	292	107	81	229	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	857	18	47	600	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	21	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	873	0	47	681	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1904			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.47		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.6		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.23		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.0	9.4		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.2			8.2			20.5			28.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	351	89	11	86	103	46	19	83	50	65	59	283
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	369	94	12	91	108	48	20	87	53	68	62	298

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	369	105	247	160	428
Volume Left (vph)	369	0	91	20	68
Volume Right (vph)	0	12	48	53	298
Hadj (s)	0.53	-0.04	-0.01	-0.14	-0.35
Departure Headway (s)	7.7	7.1	7.2	7.4	6.4
Degree Utilization, x	0.79	0.21	0.50	0.33	0.76
Capacity (veh/h)	369	487	450	417	428
Control Delay (s)	32.5	10.7	17.1	14.0	26.8
Approach Delay (s)	27.7		17.1	14.0	26.8
Approach LOS	D		C	B	D

Intersection Summary			
Delay	23.7		
HCM Level of Service	C		
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery Street

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.96	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.5			12.4			10.5	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	17.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	63.3	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	332	32	121	216	36	0	1431	92	0	1490	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1506	97	0	1568	106
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1599	0	0	1670	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.81			0.85	
Uniform Delay, d1		43.5			42.5			18.5			19.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.8			4.7	
Delay (s)		109.8			47.1			22.3			24.0	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.3			24.0	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.77			1.00	
Satd. Flow (perm)					3514	1583		2715			5075	
Volume (vph)	0	0	0	64	385	732	49	992	0	0	1509	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1044	0	0	1588	22
RTOR Reduction (vph)	0	0	0	0	0	80	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	691	0	1096	0	0	1608	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1659			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.40				
v/c Ratio					0.45	1.46		0.66			0.52	
Uniform Delay, d1					25.5	31.5		11.4			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	216.3		2.1			0.6	
Delay (s)					25.6	247.8		13.5			10.6	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			163.4			13.5			10.6	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM Average Control Delay	59.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3499		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3499		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	959	78	749	860	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1009	82	788	905	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1086	0	788	905	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1323		889	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.82		0.89	0.38	
Uniform Delay, d1		40.4						30.8		39.2	7.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						5.8		10.3	0.0	
Delay (s)		60.4						36.7		49.5	7.9	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			36.7			27.3	
Approach LOS		E			A			D			C	

Intersection Summary				
HCM Average Control Delay	37.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2010 Plus Project SAT
1/18/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	105	12	1	0	3	138	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	150	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	407	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	407	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	86	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1067	449	603	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	153	12
Volume Left	0	114	0	1
Volume Right	0	1	150	3
cSH	1604	1605	1050	661
Volume to Capacity	0.00	0.07	0.15	0.02
Queue Length 95th (ft)	0	6	13	1
Control Delay (s)	0.0	6.7	9.0	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.0	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Project Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	73	45	13	128	66	23	13	408	227	17	302	39	346	23	39	249	60	13

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	131	217	648	358	369	288	73
Delay	42.0	0.6	31.5	19.3	1.3	42.8	42.6
LOS	D	A	C	B	A	D	D

HCM Average Control Delay	**32.2**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Project SAT
5/7/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.96			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1801		1770	1787			1860	1583	1770	1831	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1801		1770	1787			1835	1583	1770	1831	
Volume (vph)	73	45	13	128	66	25	13	408	227	17	302	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	49	14	139	72	27	14	443	247	18	328	42
RTOR Reduction (vph)	0	9	0	0	12	0	0	0	153	0	3	0
Lane Group Flow (vph)	79	54	0	139	87	0	0	457	94	18	367	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	9.2	9.2		31.4	31.4			30.8	30.8	8.7	43.5	
Effective Green, g (s)	9.2	9.2		31.4	31.4			30.8	30.8	8.7	43.5	
Actuated g/C Ratio	0.10	0.10		0.33	0.33			0.32	0.32	0.09	0.45	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	169	172		578	584			588	507	160	829	
v/s Ratio Prot	c0.04	0.03		c0.08	0.05					0.01	c0.20	
v/s Ratio Perm								c0.25	0.06			
v/c Ratio	0.47	0.31		0.24	0.15			0.78	0.19	0.11	0.44	
Uniform Delay, d1	41.1	40.5		23.6	22.9			29.5	23.6	40.2	18.0	
Progression Factor	1.00	1.00		0.04	0.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.8		0.1	0.0			6.2	0.1	0.1	0.3	
Delay (s)	42.6	41.3		0.9	0.0			35.7	23.7	40.3	18.3	
Level of Service	D	D		A	A			D	C	D	B	
Approach Delay (s)		42.0			0.6			31.5			19.3	
Approach LOS		D			A			C			B	

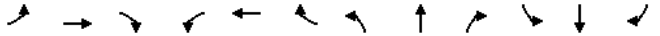
Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Project SAT
5/7/2007

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1847		1770	1863	1746	
Flt Permitted	1.00		0.21	1.00	0.96	
Satd. Flow (perm)	1847		392	1863	1746	
Volume (vph)	346	23	39	249	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	376	25	42	271	65	14
RTOR Reduction (vph)	2	0	0	0	6	0
Lane Group Flow (vph)	399	0	42	271	73	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	79.7		19.0	19.0	8.4	
Effective Green, g (s)	79.7		19.0	19.0	8.4	
Actuated g/C Ratio	0.83		0.20	0.20	0.09	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1532		78	368	153	
v/s Ratio Prot	c0.22			c0.15	c0.04	
v/s Ratio Perm			0.11			
v/c Ratio	0.26		0.54	0.74	0.47	
Uniform Delay, d1	1.8		34.6	36.2	41.7	
Progression Factor	0.67		1.00	1.00	1.00	
Incremental Delay, d2	0.1		5.5	7.1	0.8	
Delay (s)	1.3		40.1	43.3	42.6	
Level of Service	A		D	D	D	
Approach Delay (s)	1.3			42.8	42.6	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	37.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	122	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	133	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	230	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.10	-0.20	0.04
Departure Headway (s)	4.3	4.7	4.1	4.5
Degree Utilization, x	0.02	0.15	0.26	0.12
Capacity (veh/h)	761	707	843	760
Control Delay (s)	7.4	8.5	8.6	8.1
Approach Delay (s)	7.4	8.5	8.6	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay		8.4		
HCM Level of Service		A		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	70	24	13	683	436	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	26	14	742	474	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.96	0.96	0.96			
vC, conflicting volume	1293	523	572			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1306	503	554			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	54	95	99			
cM capacity (veh/h)	167	546	976			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	102	14	742	572
Volume Left	76	14	0	0
Volume Right	26	0	0	98
cSH	203	976	1700	1700
Volume to Capacity	0.50	0.01	0.44	0.34
Queue Length 95th (ft)	63	1	0	0
Control Delay (s)	39.4	8.7	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	39.4	0.2		0.0
Approach LOS	E			

Intersection Summary				
Average Delay		2.9		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1643		1770	3539	1489		3466	
Flt Permitted		0.97	1.00	0.95	0.97		0.34	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1643		639	3539	1489		3191	
Volume (vph)	31	22	136	819	78	72	151	351	401	25	396	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	890	85	78	164	382	436	27	430	60
RTOR Reduction (vph)	0	0	82	0	6	0	0	0	294	0	9	0
Lane Group Flow (vph)	0	58	66	545	502	0	164	382	142	0	508	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	37.6	37.6		36.4	36.4	36.4		36.4	
Effective Green, g (s)		24.5	24.5	37.6	37.6		35.9	35.9	35.9		35.9	
Actuated g/C Ratio		0.22	0.22	0.34	0.34		0.33	0.33	0.33		0.33	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	575	562		209	1155	486		1041	
v/s Ratio Prot		0.03		c0.32	0.31			0.11				
v/s Ratio Perm			c0.04				c0.26		0.10		0.16	
v/c Ratio		0.14	0.19	0.95	0.89		0.78	0.33	0.29		0.49	
Uniform Delay, d1		34.3	34.7	35.2	34.3		33.6	28.0	27.6		29.7	
Progression Factor		1.00	1.00	0.54	0.52		0.44	0.44	0.76		1.00	
Incremental Delay, d2		0.7	1.2	22.8	14.8		12.7	0.4	0.7		1.6	
Delay (s)		35.1	35.9	41.7	32.7		27.6	12.7	21.6		31.3	
Level of Service		D	D	D	C		C	B	C		C	
Approach Delay (s)		35.6			37.4			19.1			31.3	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	29.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	360	72	655	887	252	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	391	78	712	964	274	359
RTOR Reduction (vph)	0	37	0	0	0	22
Lane Group Flow (vph)	391	41	712	964	274	337
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	27.8	58.8	27.5	75.2	44.2	75.5
Effective Green, g (s)	27.3	58.3	27.0	74.7	43.7	75.0
Actuated g/C Ratio	0.25	0.53	0.25	0.68	0.40	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	439	839	843	1265	740	1079
v/s Ratio Prot	c0.22	0.03	c0.21	c0.52	0.15	0.21
v/s Ratio Perm						
v/c Ratio	0.89	0.05	0.84	0.76	0.37	0.31
Uniform Delay, d1	39.9	12.5	39.5	11.7	23.4	7.1
Progression Factor	0.50	0.49	0.57	1.91	1.00	1.00
Incremental Delay, d2	17.4	0.0	4.4	2.4	1.4	0.2
Delay (s)	37.3	6.1	27.0	24.8	24.8	7.2
Level of Service	D	A	C	C	C	A
Approach Delay (s)	32.1			25.8	14.9	
Approach LOS	C			C	B	

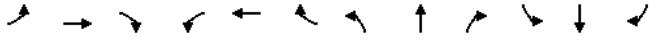
Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	73.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Volume (vph)	26	21	7	911	13	16	41	294	1133	135	432	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	990	14	17	45	320	1232	147	470	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	518	502	0	45	320	1232	147	501	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.2	26.2		3.9	18.6	72.3	8.6	23.3	
Effective Green, g (s)	2.9	2.9	2.9	26.2	26.2		3.4	19.1	72.3	8.1	23.8	
Actuated g/C Ratio	0.04	0.04	0.04	0.36	0.36		0.05	0.26	1.00	0.11	0.33	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	75	63	609	610		83	935	1583	198	604	
v/s Ratio Prot	0.02	0.01		0.31	0.30		0.03	0.09		0.08	0.27	
v/s Ratio Perm			0.00						c0.78			
v/c Ratio	0.39	0.31	0.01	0.85	0.82		0.54	0.34	0.78	0.74	0.83	
Uniform Delay, d1	33.8	33.7	33.3	21.2	20.9		33.7	21.5	0.0	31.1	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	10.9	8.6		3.8	0.2	3.8	12.3	9.1	
Delay (s)	35.2	34.6	33.3	32.1	29.5		37.5	21.7	3.8	43.4	31.4	
Level of Service	D	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.7			30.8			8.4			34.1	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

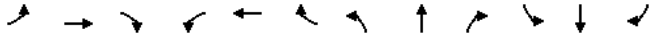
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			2989	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			2989	1399				3433		1583
Volume (vph)	113	281	1	0	359	1366	0	0	0	1121	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1485	0	0	0	1218	0	263
RTOR Reduction (vph)	0	0	0	0	146	0	0	0	0	0	0	133
Lane Group Flow (vph)	123	306	0	0	667	1062	0	0	0	1218	0	130
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	58.5			43.2	110.0				43.0		43.0
Effective Green, g (s)	11.3	58.5			43.2	110.0				43.5		43.5
Actuated g/C Ratio	0.10	0.53			0.39	1.00				0.40		0.40
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1881			1174	1399				1358		626
v/s Ratio Prot	0.07	0.09			0.22							0.08
v/s Ratio Perm						c0.76				c0.35		
v/c Ratio	0.68	0.16			0.57	0.76				0.90		0.21
Uniform Delay, d1	47.6	13.2			26.1	0.0				31.1		21.9
Progression Factor	1.00	1.00			1.01	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.1	2.3				8.1		0.1
Delay (s)	55.2	13.4			27.5	2.3				39.2		22.0
Level of Service	E	B			C	A				D		C
Approach Delay (s)		25.4			13.2			0.0			36.2	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	111	1289	0	0	1339	403	386	21	1299	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1401	0	0	1455	438	420	23	1412	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	280	0	161	1	0	0	0
Lane Group Flow (vph)	121	1401	0	0	1455	158	420	568	705	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.8	37.0			39.7	39.7	48.0	48.0	65.0			
Effective Green, g (s)	10.3	37.0			39.7	39.7	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	166	1197			1674	526	734	632	389			
v/s Ratio Prot	0.07	c0.39			c0.31		0.25	0.39	c1.07			
v/s Ratio Perm						0.11						
v/c Ratio	0.73	1.17			0.87	0.30	0.57	0.90	1.81			
Uniform Delay, d1	48.5	36.5			32.7	25.2	23.3	28.7	22.5			
Progression Factor	1.23	0.58			1.03	1.83	1.00	1.00	1.00			
Incremental Delay, d2	9.9	83.9			4.6	1.0	3.2	18.1	375.3			
Delay (s)	69.5	105.2			38.3	47.1	26.5	46.8	397.8			
Level of Service	E	F			D	D	C	D	F			
Approach Delay (s)		102.4			40.4			175.8			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	105.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1819	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1819	2628
Volume (vph)	579	759	1251	350	668	247	227	62	101	253	270	841
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	629	825	1360	380	726	268	247	67	110	275	293	914
RTOR Reduction (vph)	0	120	85	0	0	74	0	0	98	0	0	34
Lane Group Flow (vph)	629	1331	649	380	726	195	153	161	12	0	568	880
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		496	1266
v/s Ratio Prot	0.18	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.31	0.33
v/s Ratio Perm						0.13			0.01			
v/c Ratio	1.06	1.35	1.25	1.39	0.68	0.43	0.84	0.86	0.07		1.15	0.70
Uniform Delay, d1	45.5	37.5	31.5	46.5	33.9	30.9	48.0	48.2	44.0		40.0	22.2
Progression Factor	1.15	0.91	0.83	1.00	1.00	1.00	1.26	1.26	2.47		0.81	0.43
Incremental Delay, d2	31.5	157.5	111.8	195.1	3.6	2.9	23.7	26.6	0.1		81.1	2.2
Delay (s)	83.9	191.6	138.0	241.6	37.5	33.8	84.3	87.3	108.7		113.7	11.7
Level of Service	F	F	F	F	D	C	F	F	F		F	B
Approach Delay (s)		153.5			93.2			91.8			50.8	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	110.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1508	21	0	325	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1639	23	0	353	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1661	0	0	353	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.47			0.19	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.89			0.41	
Uniform Delay, d1	21.7	21.7	26.3					23.2			19.9	
Progression Factor	1.03	1.03	1.09					0.57			0.56	
Incremental Delay, d2	0.7	0.3	5.7					5.1			1.4	
Delay (s)	22.9	22.7	34.4					18.3			12.5	
Level of Service	C	C	C					B			B	
Approach Delay (s)		31.4			0.0			18.3			12.5	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	23.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3343		1770	3509		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3343		1770	3509		1770	1833		1770	1863	1548
Volume (vph)	86	607	314	38	731	36	246	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	660	341	41	795	39	267	238	24	39	250	103
RTOR Reduction (vph)	0	88	0	0	5	0	0	6	0	0	0	82
Lane Group Flow (vph)	93	913	0	41	829	0	267	256	0	39	250	21
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.8		2.2	18.0		13.1	13.1		12.7	12.7	12.7
Effective Green, g (s)	4.0	19.8		2.2	18.0		13.1	13.1		12.7	12.7	12.7
Actuated g/C Ratio	0.06	0.31		0.03	0.28		0.21	0.21		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	111	1037		61	990		363	376		352	371	308
v/s Ratio Prot	c0.05	c0.27		0.02	0.24		c0.15	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.84	0.88		0.67	0.84		0.74	0.68		0.11	0.67	0.07
Uniform Delay, d1	29.6	20.9		30.4	21.5		23.7	23.4		20.9	23.6	20.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.6	8.9		25.4	6.3		7.5	5.0		0.1	4.8	0.1
Delay (s)	69.1	29.8		55.8	27.8		31.3	28.5		21.1	28.4	20.8
Level of Service	E	C		E	C		C	C		C	C	C
Approach Delay (s)		33.1			29.1			29.9			25.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	30.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	63.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3433		1770	3518			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3433		1770	3518			1802	1555		1774	
Volume (vph)	18	1012	164	175	1083	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1100	178	190	1177	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1269	0	190	1208	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1517		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.37		c0.11	0.34			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.84		0.97	0.63			0.76	0.15		0.22	
Uniform Delay, d1	49.5	24.7		44.3	16.0			39.8	35.7		39.7	
Progression Factor	1.04	0.52		0.80	0.67			1.00	1.00		1.00	
Incremental Delay, d2	216.7	5.3		26.6	0.5			9.9	0.2		0.4	
Delay (s)	268.4	18.2		62.2	11.2			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		22.1			18.1			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3071		1770	3360		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3071		1770	3360		3433	3511		1770	3339	
Volume (vph)	167	646	406	72	526	102	552	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	702	441	78	572	111	600	988	27	160	1017	200
RTOR Reduction (vph)	0	97	0	0	16	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1046	0	78	667	0	600	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	992		83	816		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.34		0.04	0.20		c0.17	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.05		0.94	0.82		1.09	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.9		47.5	35.8		42.0	29.4		42.9	34.5	
Progression Factor	1.17	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.8	39.4		77.0	8.9		66.2	6.1		15.0	82.9	
Delay (s)	62.4	53.8		124.5	44.7		108.2	35.5		57.8	117.4	
Level of Service	E	D		F	D		F	D		E	F	
Approach Delay (s)		54.9			52.9			62.5			110.5	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	72.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
PREFERRED PROJECT ALTERNATIVE
2030

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3381		1770	3502		1770	3435		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3381		1770	3502		1770	3435		1770	1863	1583
Volume (vph)	577	881	372	118	778	59	120	267	66	68	270	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	392	124	819	62	126	281	69	72	284	214
RTOR Reduction (vph)	0	40	0	0	5	0	0	20	0	0	0	178
Lane Group Flow (vph)	607	1279	0	124	876	0	126	330	0	72	284	36
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	49.1		11.1	25.2		14.3	14.3		18.5	18.5	18.5
Effective Green, g (s)	35.0	50.1		11.1	26.2		14.3	14.3		18.5	18.5	18.5
Actuated g/C Ratio	0.32	0.46		0.10	0.24		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1540		179	834		230	447		298	313	266
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.15	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.83		0.69	1.05		0.55	0.74		0.24	0.91	0.14
Uniform Delay, d1	37.5	26.2		47.8	41.9		44.8	46.0		39.7	44.9	38.9
Progression Factor	1.00	1.00		0.89	1.19		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.3		5.0	35.4		2.1	5.9		0.4	28.2	0.2
Delay (s)	98.2	31.6		47.4	85.1		46.9	52.0		40.1	73.1	39.2
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		52.6			80.5			50.6			56.2	
Approach LOS		D			F			D			E	

Intersection Summary					
HCM Average Control Delay	59.9	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.98				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	89.5%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3421		1770	3485		1770	3459	
Flt Permitted	0.19	1.00			0.64		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	347	3451			2193		1770	3485		1770	3459	
Volume (vph)	123	746	148	77	602	162	218	789	90	119	877	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	81	634	171	229	831	95	125	923	164
RTOR Reduction (vph)	0	16	0	0	20	0	0	7	0	0	13	0
Lane Group Flow (vph)	129	925	0	0	866	0	229	919	0	125	1074	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	44.8	44.8			44.8		15.7	36.2		16.0	36.5	
Effective Green, g (s)	44.8	44.8			44.8		15.7	37.2		16.0	37.5	
Actuated g/C Ratio	0.41	0.41			0.41		0.14	0.34		0.15	0.34	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	141	1405			893		253	1179		257	1179	
v/s Ratio Prot		0.27					c0.13	0.26		0.07	c0.31	
v/s Ratio Perm	0.37				c0.39							
v/c Ratio	0.91	0.66			0.97		0.91	0.78		0.49	0.91	
Uniform Delay, d1	30.8	26.4			31.9		46.4	32.7		43.2	34.7	
Progression Factor	0.40	0.43			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	0.7			22.7		32.4	5.1		1.5	12.1	
Delay (s)	48.5	12.0			54.6		78.8	37.8		44.7	46.7	
Level of Service	D	B			D		E	D		D	D	
Approach Delay (s)		16.4			54.6			46.0			46.5	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	94	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	99	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	452	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	452	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	91	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	438	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	101	1
Volume Left	0	145	2	0
Volume Right	2	1	99	0
cSH	1545	1616	1059	520
Volume to Capacity	0.00	0.09	0.10	0.00
Queue Length 95th (ft)	0	7	8	0
Control Delay (s)	0.0	5.5	8.8	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.8	11.9
Approach LOS			A	B

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Project AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	58	61	5	69	47	222	11	128	65	120	252	152	237	9	50	169	169	14

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	124	338	204	524	246	219	183
Delay	35.4	0.8	33.2	30.1	0.6	29.4	39.0
LOS	C	A	C	C	A	C	D

HCM Average Control Delay	**32.3**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1632			1855	1583	1770	1758	
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1632			1761	1583	1770	1758	
Volume (vph)	58	61	5	69	47	222	11	128	65	120	252	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	64	5	73	49	234	12	135	68	126	265	160
RTOR Reduction (vph)	0	3	0	0	120	0	0	0	58	0	20	0
Lane Group Flow (vph)	61	66	0	73	163	0	0	147	10	126	405	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	8.1	8.1		35.4	35.4			12.2	12.2	10.3	26.5	
Effective Green, g (s)	8.1	8.1		35.4	35.4			12.2	12.2	10.3	26.5	
Actuated g/C Ratio	0.10	0.10		0.43	0.43			0.15	0.15	0.13	0.32	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	175	182		764	705			262	236	222	568	
v/s Ratio Prot	0.03	c0.04		0.04	c0.10					0.07	c0.23	
v/s Ratio Perm								0.08	0.01			
v/c Ratio	0.35	0.36		0.10	0.23			0.56	0.04	0.57	0.71	
Uniform Delay, d1	34.5	34.5		13.8	14.7			32.4	29.9	33.8	24.4	
Progression Factor	1.00	1.00		0.15	0.03			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.9		0.0	0.1			2.2	0.1	2.0	4.0	
Delay (s)	35.4	35.4		2.1	0.4			34.6	30.0	35.7	28.4	
Level of Service	D	D		A	A			C	C	D	C	
Approach Delay (s)		35.4			0.8			33.2			30.1	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	22.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1854		1770	1863	1762	
Flt Permitted	1.00		0.21	1.00	0.96	
Satd. Flow (perm)	1854		398	1863	1762	
Volume (vph)	237	9	50	169	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	249	9	53	178	178	15
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	257	0	53	178	190	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	61.3		18.7	18.7	12.7	
Effective Green, g (s)	61.3		18.7	18.7	12.7	
Actuated g/C Ratio	0.75		0.23	0.23	0.15	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1386		91	425	273	
v/s Ratio Prot	c0.14			0.10	c0.11	
v/s Ratio Perm			c0.13			
v/c Ratio	0.19		0.58	0.42	0.70	
Uniform Delay, d1	3.0		28.2	27.0	32.8	
Progression Factor	0.19		1.00	1.00	1.00	
Incremental Delay, d2	0.0		7.6	0.5	6.1	
Delay (s)	0.6		35.8	27.5	39.0	
Level of Service	A		D	C	D	
Approach Delay (s)	0.6			29.4	39.0	
Approach LOS	A			C	D	

Intersection Summary				
HCM Average Control Delay	21.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1723			1823		1770	1851		1770	1820	
Flt Permitted		0.91			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1589			1445		1770	1851		1770	1820	
Volume (vph)	68	79	132	37	68	4	36	338	14	23	524	95
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	72	83	139	39	72	4	38	356	15	24	552	100
RTOR Reduction (vph)	0	65	0	0	2	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	229	0	0	113	0	38	369	0	24	641	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		318			289		85	1003		32	932	
v/s Ratio Prot							c0.02	0.20		0.01	c0.35	
v/s Ratio Perm		c0.14			0.08							
v/c Ratio		0.72			0.39		0.45	0.37		0.75	0.69	
Uniform Delay, d1		18.7			17.4		23.2	6.5		24.4	9.2	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		7.3			0.6		2.7	1.0		62.8	4.1	
Delay (s)		26.0			18.0		23.4	8.5		87.2	13.3	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		26.0			18.0			9.9			16.0	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	16.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	93	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	98	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	187	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.15	0.01
Departure Headway (s)	4.4	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.21	0.18
Capacity (veh/h)	734	692	847	803
Control Delay (s)	7.5	8.3	8.2	8.3
Approach Delay (s)	7.5	8.3	8.2	8.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
HCM Level of Service	A		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	59	20	18	161	307	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	62	21	19	169	323	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	542	334	345			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	542	334	345			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	97	98			
cM capacity (veh/h)	494	708	1214			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	83	19	169	345
Volume Left	62	19	0	0
Volume Right	21	0	0	22
cSH	535	1214	1700	1700
Volume to Capacity	0.16	0.02	0.10	0.20
Queue Length 95th (ft)	14	1	0	0
Control Delay (s)	13.0	8.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.0	0.8		0.0
Approach LOS	B			

Intersection Summary				
Average Delay			2.0	
Intersection Capacity Utilization		28.6%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1662		1770	3539	1583		3520	
Flt Permitted		0.97	1.00	0.95	0.96		0.52	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1662		977	3539	1583		3312	
Volume (vph)	39	28	117	389	4	29	60	193	109	17	337	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	409	4	31	63	203	115	18	355	8
RTOR Reduction (vph)	0	0	116	0	6	0	0	0	39	0	1	0
Lane Group Flow (vph)	0	70	7	230	208	0	63	203	76	0	380	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.6	15.6		67.0	67.0	67.0		67.0	
Effective Green, g (s)		5.9	5.9	15.6	15.6		66.5	66.5	66.5		66.5	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	262	259		650	2353	1053		2202	
v/s Ratio Prot		c0.04		c0.14	0.13			0.06				
v/s Ratio Perm			0.00				0.06		0.05		c0.11	
v/c Ratio		0.65	0.08	0.88	0.80		0.10	0.09	0.07		0.17	
Uniform Delay, d1		46.1	44.5	41.3	40.7		6.0	6.0	5.9		6.3	
Progression Factor		1.00	1.00	1.55	1.58		0.05	0.07	0.00		1.00	
Incremental Delay, d2		12.1	0.3	25.8	15.9		0.3	0.1	0.1		0.2	
Delay (s)		58.2	44.7	89.9	80.0		0.6	0.5	0.1		6.5	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6			85.1			0.4			6.5	
Approach LOS		D			F			A			A	

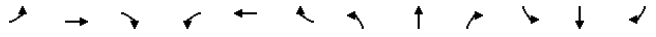
Intersection Summary						
HCM Average Control Delay		35.7	HCM Level of Service		D	
HCM Volume to Capacity ratio		0.33				
Actuated Cycle Length (s)		100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization		45.2%	ICU Level of Service		A	
Analysis Period (min)		15				
c Critical Lane Group						

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	71	38	285	191	136	185
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	40	300	201	143	195
RTOR Reduction (vph)	0	29	0	0	0	178
Lane Group Flow (vph)	75	11	300	201	143	17
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	9.2	27.6	14.9	83.8	65.4	9.2
Effective Green, g (s)	8.7	27.1	14.4	83.3	64.9	8.7
Actuated g/C Ratio	0.09	0.27	0.14	0.83	0.65	0.09
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	154	429	494	1552	1209	138
v/s Ratio Prot	c0.04	0.01	c0.09	c0.11	0.08	0.01
v/s Ratio Perm						
v/c Ratio	0.49	0.03	0.61	0.13	0.12	0.12
Uniform Delay, d1	43.5	26.8	40.1	1.6	6.7	42.1
Progression Factor	0.84	2.65	1.02	0.10	1.00	1.00
Incremental Delay, d2	2.4	0.0	2.1	0.2	0.2	0.4
Delay (s)	38.7	71.0	43.0	0.3	6.9	42.5
Level of Service	D	E	D	A	A	D
Approach Delay (s)	50.0			25.9	27.4	
Approach LOS	D			C	C	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

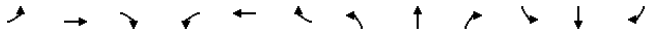
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1803	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1803	
Volume (vph)	5	21	16	709	79	0	88	106	899	76	261	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	746	83	0	93	112	946	80	275	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	404	425	0	93	112	946	80	340	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.9	2.9	2.9	24.2	24.2		4.7	16.5	63.5	4.4	16.2	
Effective Green, g (s)	2.4	2.4	2.4	24.2	24.2		4.2	17.0	63.5	3.9	16.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.38	0.38		0.07	0.27	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	67	70	60	641	648		117	947	1583	109	474	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	0.19	
v/s Ratio Perm			0.00						c0.60			
v/c Ratio	0.07	0.31	0.01	0.63	0.66		0.79	0.12	0.60	0.73	0.72	
Uniform Delay, d1	29.5	29.7	29.4	16.0	16.2		29.2	17.6	0.0	29.3	21.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	1.8	2.1		28.3	0.0	1.7	19.6	4.8	
Delay (s)	29.7	30.7	29.4	17.8	18.4		57.5	17.6	1.7	48.9	26.0	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.1			18.1			7.7			30.3	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	0.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3288			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3288			3390	1441				3433		1583
Volume (vph)	120	236	211	0	741	1083	0	0	0	828	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1140	0	0	0	872	0	151
RTOR Reduction (vph)	0	83	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	126	387	0	0	780	1140	0	0	0	872	0	45
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.5			39.5	100.0				29.0		29.0
Effective Green, g (s)	19.0	62.5			39.5	100.0				29.5		29.5
Actuated g/C Ratio	0.19	0.62			0.40	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2055			1339	1441				1013		467
v/s Ratio Prot	0.07	0.12			0.23					0.25		
v/s Ratio Perm						c0.79						0.03
v/c Ratio	0.38	0.19			0.58	0.79				0.86		0.10
Uniform Delay, d1	35.3	8.0			23.8	0.0				33.3		25.6
Progression Factor	1.00	1.00			0.68	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	2.1				7.5		0.1
Delay (s)	35.6	8.2			17.0	2.1				40.8		25.6
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.0			8.1			0.0			38.6	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1462	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1462	1504			
Volume (vph)	82	981	0	0	1179	392	645	2	1246	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1033	0	0	1241	413	679	2	1312	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	281	0	77	32	0	0	0
Lane Group Flow (vph)	86	1033	0	0	1241	132	600	625	659	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	556	677			
v/s Ratio Prot	0.05	c0.20			c0.27		0.36	c0.43	c0.44			
v/s Ratio Perm						0.08						
v/c Ratio	0.27	0.43			0.84	0.26	0.94	1.12	0.97			
Uniform Delay, d1	35.3	17.6			31.6	25.2	29.9	31.0	26.9			
Progression Factor	0.69	0.49			0.49	0.28	1.00	1.00	1.00			
Incremental Delay, d2	1.8	0.5			4.4	0.9	21.8	77.2	28.0			
Delay (s)	26.3	9.1			19.8	8.1	51.7	108.2	54.9			
Level of Service	C	A			B	A	D	F	D			
Approach Delay (s)		10.4			16.9			72.7			0.0	
Approach LOS		B			B			E			A	

Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1792	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1792	2628
Volume (vph)	292	1601	334	75	843	82	42	3	42	170	45	692
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	292	1601	334	75	843	82	42	3	42	170	45	692
RTOR Reduction (vph)	0	0	145	0	0	15	0	0	39	0	0	194
Lane Group Flow (vph)	292	1601	189	75	843	67	22	23	3	0	215	498
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		538	1317
v/s Ratio Prot	0.09	c0.47	c0.13	0.04	c0.24		0.01	0.01			c0.12	0.19
v/s Ratio Perm						0.04			0.00			
v/c Ratio	0.42	1.16	0.25	0.67	0.88	0.16	0.19	0.20	0.03		0.40	0.38
Uniform Delay, d1	34.9	29.6	13.4	45.8	35.0	27.8	43.9	43.9	43.4		27.8	15.4
Progression Factor	1.11	0.60	0.36	1.00	1.00	1.00	1.00	1.00	1.00		1.25	1.05
Incremental Delay, d2	1.2	76.4	0.1	11.2	11.5	0.8	0.6	0.6	0.1		1.9	0.7
Delay (s)	39.9	94.1	4.9	57.0	46.5	28.6	44.5	44.5	43.5		36.7	16.8
Level of Service	D	F	A	E	D	C	D	D	D		D	B
Approach Delay (s)		73.6			45.8			44.0			21.5	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM Average Control Delay	55.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	221	0	0	0	0	485	9	0	177	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	511	9	0	186	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	519	0	0	186	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.15			0.10	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.23			0.18	
Uniform Delay, d1	26.8	26.8	21.1					7.4			10.8	
Progression Factor	0.99	0.98	0.90					1.00			0.96	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.4	
Delay (s)	26.8	26.4	19.0					7.6			10.7	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.1			0.0			7.6			10.7	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3340		1770	3482		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3340		1770	3482		1770	1839		1770	1863	1583
Volume (vph)	405	490	294	36	523	63	281	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	516	309	38	551	66	296	286	27	32	306	115
RTOR Reduction (vph)	0	78	0	0	9	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	747	0	38	608	0	296	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	22.6	39.4		5.7	22.5		20.4	20.4		19.5	19.5	19.5
Effective Green, g (s)	22.1	39.9		5.2	23.0		19.9	19.9		19.0	19.0	19.0
Actuated g/C Ratio	0.22	0.40		0.05	0.23		0.20	0.20		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	391	1333		92	801		352	366		336	354	301
v/s Ratio Prot	c0.24	0.22		0.02	c0.17		0.17	c0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.09	0.56		0.41	0.76		0.84	0.85		0.10	0.86	0.07
Uniform Delay, d1	39.0	23.3		45.9	35.9		38.5	38.6		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.01	1.01		0.75	0.80	1.33
Incremental Delay, d2	71.7	1.7		3.0	6.7		16.3	16.2		0.1	17.7	0.1
Delay (s)	110.7	25.0		48.9	42.6		55.3	55.3		25.2	49.1	44.2
Level of Service	F	C		D	D		E	E		C	D	D
Approach Delay (s)		54.2			42.9			55.3			46.2	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	50.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385		1770	3517		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3385		1770	3517		1770	3497		1770	3487	
Volume (vph)	103	310	127	105	499	22	125	706	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	326	134	111	525	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	49	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	411	0	111	545	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.0		10.8	20.8		12.5	49.0		7.2	43.7	
Effective Green, g (s)	7.0	18.5		9.8	21.3		11.5	49.5		6.2	44.2	
Actuated g/C Ratio	0.07	0.18		0.10	0.21		0.12	0.50		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	626		173	749		204	1731		110	1541	
v/s Ratio Prot	c0.06	0.12		0.06	c0.15		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.66		0.64	0.73		0.65	0.46		0.47	0.67	
Uniform Delay, d1	46.1	37.8		43.4	36.6		42.3	16.6		45.3	22.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.5		7.9	3.5		6.9	0.9		3.2	2.4	
Delay (s)	90.2	40.3		51.3	40.2		49.2	17.4		48.5	24.5	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.8			42.1			21.9			25.6	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	32.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3427		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3427		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	291	78	83	405	324	73	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	306	82	87	426	341	77	395	45	101	151	9
RTOR Reduction (vph)	0	21	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	367	0	87	426	129	77	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1131		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.04	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.32		0.67	0.32	0.22	0.17	0.93			0.78	
Uniform Delay, d1	48.1	25.1		45.2	22.1	21.1	29.0	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.8		11.9	0.6	0.8	0.1	25.3			11.1	
Delay (s)	60.4	25.9		57.1	22.7	21.9	29.1	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.1			25.9			56.8			50.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	37.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3458		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3458		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	65	57	770	198	131	325	40	165	252	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	68	60	811	208	138	342	42	174	265	11
RTOR Reduction (vph)	0	12	0	0	0	110	0	0	32	0	2	0
Lane Group Flow (vph)	29	430	0	60	811	98	138	342	11	174	274	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.4		7.1	47.0	47.0	12.0	25.5	25.5	8.5	22.0	
Effective Green, g (s)	4.0	44.4		6.6	47.0	47.0	11.5	25.0	25.0	8.0	21.5	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.22	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1535		117	1663	744	204	466	396	142	398	
v/s Ratio Prot	0.02	0.12		c0.03	c0.23		0.08	c0.18		c0.10	0.15	
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.13	0.68	0.73	0.03	1.23	0.69	
Uniform Delay, d1	46.8	17.7		45.1	18.2	15.0	42.5	34.4	28.3	46.0	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.84	
Incremental Delay, d2	2.8	0.5		2.8	1.0	0.4	7.8	5.6	0.0	145.6	4.2	
Delay (s)	49.6	18.1		48.0	19.2	15.3	50.3	40.0	28.3	192.5	34.7	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		20.0			20.1			41.8			95.7	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM Average Control Delay	38.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	517	16	90	1001	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	544	17	95	1054	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1079			561			1324	1874	281	1665	1869	539
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1079			561			1324	1874	281	1665	1869	539
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			91			72	78	89	95	95	100
cM capacity (veh/h)	642			1006			98	62	717	42	62	486

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	363	198	95	702	376	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	642	1700	1700	1006	1700	1700	88	386	61
Volume to Capacity	0.04	0.21	0.12	0.09	0.41	0.22	0.39	0.22	0.10
Queue Length 95th (ft)	3	0	0	8	0	0	39	21	8
Control Delay (s)	10.8	0.0	0.0	8.9	0.0	0.0	70.0	16.9	70.2
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			32.2		70.2
Approach LOS							D		F

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3461		1770	3506			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3461		1770	3506			1810	1583		1408	
Volume (vph)	3	498	86	122	803	54	244	178	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	524	91	128	845	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	603	0	128	898	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.2		11.0	49.3			26.5	26.5		8.8	
Effective Green, g (s)	0.4	39.2		10.5	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.39		0.10	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1357		186	1728			471	412		117	
v/s Ratio Prot	0.00	c0.17		c0.07	c0.26			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.44		0.69	0.52			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.4		43.2	17.3			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.98	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.1		5.2	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.4		47.6	11.0			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.7			15.5			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	28.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3364		1770	3389		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3364		1770	3389		3433	3535		1770	3509	
Volume (vph)	98	359	177	32	568	225	344	961	8	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	378	186	34	598	237	362	1012	8	175	1072	64
RTOR Reduction (vph)	0	60	0	0	38	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	504	0	34	797	0	362	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	30.3		7.9	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	29.3		6.9	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.29		0.07	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	986		122	956		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.51		0.28	0.83		0.75	0.82		0.78	0.95	
Uniform Delay, d1	44.9	29.4		44.2	33.7		41.3	29.5		42.4	32.3	
Progression Factor	1.50	1.31		1.13	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.3		0.4	5.6		5.8	6.1		15.3	17.2	
Delay (s)	80.8	38.9		50.2	41.2		47.2	35.6		57.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		45.4			41.6			38.6			50.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3499			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3506		1770	3499			3169			2905	
Volume (vph)	58	452	30	111	723	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	476	32	117	761	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	499	0	117	814	0	0	195	0	0	367	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		166	1882			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.23							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.43			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.80	1.18		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.8	0.4		10.6	0.7			0.4			5.2	
Delay (s)	37.6	9.2		32.5	7.7			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.3			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	1.00			0.94			0.95			0.89	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	1854			1738			1728			1644	
Flt Permitted	0.44	1.00			0.98			0.90			0.95	
Satd. Flow (perm)	819	1854			1714			1588			1567	
Volume (vph)	424	58	2	8	83	84	2	1	2	49	4	234
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	446	61	2	8	87	88	2	1	2	52	4	246
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	187	0
Lane Group Flow (vph)	446	62	0	0	120	0	0	3	0	0	115	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.4	20.4			6.5			9.0			9.0	
Effective Green, g (s)	20.4	20.4			6.5			9.0			9.0	
Actuated g/C Ratio	0.55	0.55			0.17			0.24			0.24	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	698	1011			298			382			377	
v/s Ratio Prot	c0.17	0.03										
v/s Ratio Perm	c0.18				0.07			0.00			c0.07	
v/c Ratio	0.64	0.06			0.40			0.01			0.31	
Uniform Delay, d1	5.9	4.0			13.7			10.8			11.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	1.9	0.0			0.9			0.0			0.5	
Delay (s)	7.8	4.0			14.6			10.8			12.1	
Level of Service	A	A			B			B			B	
Approach Delay (s)		7.4			14.6			10.8			12.1	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3509			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3509			3494	
Volume (vph)	77	193	12	112	289	20	0	1210	72	0	1126	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1274	76	0	1185	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1346	0	0	1290	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2045			2037	
v/s Ratio Prot					c0.13			c0.38			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.66			0.63	
Uniform Delay, d1		44.0			41.9			14.8			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.7			1.5	
Delay (s)		57.5			47.6			16.5			16.0	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.5			16.0	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3253			5077	
Volume (vph)	0	0	0	65	656	814	12	618	0	0	1172	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	651	0	0	1234	13
RTOR Reduction (vph)	0	0	0	0	0	147	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	710	0	664	0	0	1246	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1789			2792	
v/s Ratio Prot					0.22						c0.25	
v/s Ratio Perm						c0.45		0.20				
v/c Ratio					0.58	1.21		0.37			0.45	
Uniform Delay, d1					25.3	31.5		12.7			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	110.5		0.6			0.5	
Delay (s)					25.7	142.0		13.3			13.9	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			87.4			13.3			13.9	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM Average Control Delay	47.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Project AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3496		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3496		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	612	54	532	673	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	644	57	560	708	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	694	0	560	708	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1513		638	2391	
v/s Ratio Prot		c0.15						c0.20		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.46		0.88	0.30	
Uniform Delay, d1		25.6						14.0		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.0		12.6	0.0	
Delay (s)		28.2						15.1		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.1			20.4	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3429		1770	3498		1770	3424		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3429		1770	3498		1770	3424		1770	1863	1583
Volume (vph)	300	794	209	148	903	76	202	506	140	151	381	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	220	156	951	80	213	533	147	159	401	533
RTOR Reduction (vph)	0	21	0	0	6	0	0	23	0	0	0	294
Lane Group Flow (vph)	316	1035	0	156	1025	0	213	657	0	159	401	239
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	38.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1222		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.12	c0.19		0.09	c0.22	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.66	1.05		0.45	1.08	0.75
Uniform Delay, d1	43.5	32.6		47.1	39.6		41.9	45.0		38.7	44.0	41.4
Progression Factor	1.00	1.00		1.18	0.92		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.4		1.5	25.7		3.7	47.8		0.9	68.1	9.7
Delay (s)	72.8	40.0		57.3	62.0		45.3	92.9		39.6	112.1	51.1
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.6			61.4			81.5			71.8	
Approach LOS		D			E			F			E	

Intersection Summary				
HCM Average Control Delay	63.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3439		1770	3489		1770	3458	
Flt Permitted	0.16	1.00			0.61		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	301	3382			2104		1770	3489		1770	3458	
Volume (vph)	202	684	288	88	702	149	279	1237	130	191	1120	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	93	739	157	294	1302	137	201	1179	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	8	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	975	0	294	1432	0	201	1379	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	131	1476			918		274	1110		241	1037	
v/s Ratio Prot		0.29					0.17	c0.41		0.11	c0.40	
v/s Ratio Perm	c0.71				0.46							
v/c Ratio	1.63	0.66			1.06		1.07	1.29		0.83	1.33	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.08	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	302.6	0.7			47.6		75.1	137.2		21.3	155.0	
Delay (s)	336.3	27.3			78.6		121.6	174.7		67.6	193.5	
Level of Service	F	C			E		F	F		E	F	
Approach Delay (s)		80.5			78.6			165.7			177.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	134.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	121.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	142	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	149	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	584	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	584	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	86	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	328	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	153	2
Volume Left	1	197	2	1
Volume Right	0	0	149	0
cSH	1599	1596	1031	380
Volume to Capacity	0.00	0.12	0.15	0.01
Queue Length 95th (ft)	0	11	13	0
Control Delay (s)	0.4	7.0	9.1	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	7.0	9.1	14.5
Approach LOS			A	B

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Project PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	102	79	6	165	106	501	10	415	229	93	368	110	380	21	37	384	388	43

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	187	772	654	571	401	421	431
Delay	52.2	9.7	52.3	35.7	2.2	147.1	243.4
LOS	D	A	D	C	A	F	F

HCM Average Control Delay	**102.1**
HCM Level of Service	**F**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1632			1860	1583	1770	1798	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1632			1834	1583	1770	1798	
Volume (vph)	102	79	6	165	106	501	10	415	229	93	368	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	107	83	6	174	112	527	11	437	241	98	387	116
RTOR Reduction (vph)	0	2	0	0	128	0	0	0	168	0	8	0
Lane Group Flow (vph)	107	87	0	174	511	0	0	448	73	98	495	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	11.7	11.7		46.2	46.2			30.7	30.7	10.6	45.3	
Effective Green, g (s)	11.7	11.7		46.2	46.2			30.7	30.7	10.6	45.3	
Actuated g/C Ratio	0.10	0.10		0.40	0.40			0.27	0.27	0.09	0.39	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	180	187		710	655			489	422	163	707	
v/s Ratio Prot	c0.06	0.05		0.10	c0.31					0.06	c0.27	
v/s Ratio Perm								c0.24	0.05			
v/c Ratio	0.59	0.47		0.25	0.78			0.92	0.17	0.60	0.70	
Uniform Delay, d1	49.5	48.8		22.9	30.1			41.0	32.5	50.3	29.3	
Progression Factor	1.00	1.00		0.28	0.34			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.4	1.3		0.0	0.5			21.8	0.1	4.2	2.8	
Delay (s)	53.8	50.1		6.5	10.6			62.8	32.6	54.5	32.1	
Level of Service	D	D		A	B			E	C	D	C	
Approach Delay (s)		52.2			9.7			52.3			35.7	
Approach LOS		D			A			D			D	

Intersection Summary				
HCM Average Control Delay	32.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	103.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1850		1770	1863	1759	
Flt Permitted	1.00		0.19	1.00	0.96	
Satd. Flow (perm)	1850		353	1863	1759	
Volume (vph)	380	21	37	384	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	22	39	404	408	45
RTOR Reduction (vph)	2	0	0	0	3	0
Lane Group Flow (vph)	420	0	39	404	450	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	86.1		21.1	21.1	21.1	
Effective Green, g (s)	86.1		21.1	21.1	21.1	
Actuated g/C Ratio	0.75		0.18	0.18	0.18	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1383		65	341	322	
v/s Ratio Prot	c0.23			c0.22	c0.26	
v/s Ratio Perm			0.11			
v/c Ratio	0.30		0.60	1.18	1.40	
Uniform Delay, d1	4.8		43.2	47.0	47.0	
Progression Factor	0.44		1.00	1.00	1.00	
Incremental Delay, d2	0.1		11.8	109.0	196.4	
Delay (s)	2.2		55.0	156.0	243.4	
Level of Service	A		E	F	F	
Approach Delay (s)	2.2			147.1	243.4	
Approach LOS	A			F	F	

Intersection Summary				
HCM Average Control Delay	133.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772			1805		1770	1843		1770	1755	
Flt Permitted		0.79			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1436			1580		1770	1843		1770	1755	
Volume (vph)	184	210	68	36	116	20	163	712	44	19	404	185
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	194	221	72	38	122	21	172	749	46	20	425	195
RTOR Reduction (vph)	0	11	0	0	9	0	0	3	0	0	30	0
Lane Group Flow (vph)	0	476	0	0	172	0	172	792	0	20	590	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		418			460		222	875		29	641	
v/s Ratio Prot							c0.10	c0.43		0.01	0.34	
v/s Ratio Perm		c0.33			0.11							
v/c Ratio		1.14			0.37		0.77	0.90		0.69	0.92	
Uniform Delay, d1		19.5			15.5		23.3	13.3		26.9	16.7	
Progression Factor		1.00			1.00		0.91	1.07		0.97	1.11	
Incremental Delay, d2		87.3			0.4		13.4	13.3		39.4	17.3	
Delay (s)		106.8			15.9		34.7	27.5		65.6	35.9	
Level of Service		F			B		C	C		E	D	
Approach Delay (s)		106.8			15.9			28.8			36.8	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	46.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	146	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	154	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	242	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.13	0.04
Departure Headway (s)	4.7	5.2	4.6	4.8
Degree Utilization, x	0.11	0.19	0.31	0.26
Capacity (veh/h)	674	627	745	707
Control Delay (s)	8.3	9.5	9.6	9.5
Approach Delay (s)	8.3	9.5	9.6	9.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	58	34	19	586	437	106
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	36	20	617	460	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1173	516	572			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	490	548			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	93	98			
cM capacity (veh/h)	195	549	969			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	97	20	617	572
Volume Left	61	20	0	0
Volume Right	36	0	0	112
cSH	256	969	1700	1700
Volume to Capacity	0.38	0.02	0.36	0.34
Queue Length 95th (ft)	42	2	0	0
Control Delay (s)	27.4	8.8	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	27.4	0.3		0.0
Approach LOS	D			

Intersection Summary			
Average Delay		2.2	
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1653		1770	3539	1452		3454	
Flt Permitted		0.97	1.00	0.95	0.97		0.37	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1653		692	3539	1452		3211	
Volume (vph)	12	5	95	647	63	53	130	343	209	22	404	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	681	66	56	137	361	220	23	425	71
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	136	0	12	0
Lane Group Flow (vph)	0	18	6	412	385	0	137	361	84	0	507	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	742		265	1358	557		1232	
v/s Ratio Prot		c0.01		c0.25	0.23			0.10				
v/s Ratio Perm			0.00				c0.20		0.06		0.16	
v/c Ratio		0.17	0.06	0.55	0.52		0.52	0.27	0.15		0.41	
Uniform Delay, d1		49.3	49.0	22.1	21.8		26.1	23.3	22.2		24.8	
Progression Factor		1.00	1.00	0.26	0.24		0.95	0.87	1.30		1.00	
Incremental Delay, d2		0.6	0.2	2.5	2.3		5.0	0.3	0.4		1.0	
Delay (s)		49.8	49.2	8.2	7.5		29.8	20.6	29.3		25.8	
Level of Service		D	D	A	A		C	C	C		C	
Approach Delay (s)		49.3			7.8			25.0			25.8	
Approach LOS		D			A			C			C	

Intersection Summary					
HCM Average Control Delay	20.1	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	66.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	195	34	474	658	269	289
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	36	499	693	283	304
RTOR Reduction (vph)	0	21	0	0	0	137
Lane Group Flow (vph)	205	15	499	693	283	167
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	17.7	46.7	25.5	85.3	56.3	17.7
Effective Green, g (s)	17.2	46.2	25.0	84.8	55.8	17.2
Actuated g/C Ratio	0.16	0.42	0.23	0.77	0.51	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	665	780	1436	945	248
v/s Ratio Prot	c0.12	0.01	c0.15	c0.37	0.15	0.11
v/s Ratio Perm						
v/c Ratio	0.74	0.02	0.64	0.48	0.30	0.67
Uniform Delay, d1	44.3	18.7	38.4	4.6	15.7	43.8
Progression Factor	0.63	0.18	1.01	0.11	1.00	1.00
Incremental Delay, d2	9.8	0.0	1.5	1.0	0.8	7.1
Delay (s)	37.6	3.3	40.1	1.5	16.6	50.8
Level of Service	D	A	D	A	B	D
Approach Delay (s)	32.5			17.7	34.3	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	573	14	0	11	721	1362	269	589	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	603	15	0	12	759	1434	283	620	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	302	316	0	12	759	1434	283	667	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	20.2	20.2		1.2	24.1	93.6	17.5	40.4	
Effective Green, g (s)	15.8	15.8	15.8	20.2	20.2		0.7	24.6	93.6	17.0	40.9	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	299	314	267	363	365		13	930	1583	321	799	
v/s Ratio Prot	0.10	c0.21		0.18	0.19		0.01	0.21		0.16	0.36	
v/s Ratio Perm			0.03						c0.91			
v/c Ratio	0.61	1.24	0.17	0.83	0.87		0.92	0.82	0.91	0.88	0.83	
Uniform Delay, d1	36.0	38.9	33.3	35.1	35.4		46.4	32.4	0.0	37.3	23.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	131.7	0.1	14.7	18.7		205.3	5.5	9.0	22.9	7.4	
Delay (s)	38.4	170.6	33.4	49.8	54.1		251.7	37.8	9.0	60.2	30.7	
Level of Service	D	F	C	D	D		F	D	A	E	C	
Approach Delay (s)		119.2			52.0			20.3			39.5	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM Average Control Delay	43.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	93.6	Sum of lost time (s)	4.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2971	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2971	1399				3433		1583
Volume (vph)	142	429	603	0	569	1851	0	0	0	921	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	1948	0	0	0	969	0	361
RTOR Reduction (vph)	0	221	0	0	191	0	0	0	0	0	0	209
Lane Group Flow (vph)	149	866	0	0	1123	1233	0	0	0	969	0	152
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.8			43.8	110.0				33.7		33.7
Effective Green, g (s)	20.0	67.8			43.8	110.0				34.2		34.2
Actuated g/C Ratio	0.18	0.62			0.40	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1990			1183	1399				1067		492
v/s Ratio Prot	0.08	0.27			0.38							0.10
v/s Ratio Perm						c0.88				0.28		
v/c Ratio	0.46	0.43			0.95	0.88				0.91		0.31
Uniform Delay, d1	40.2	11.1			32.0	0.0				36.4		28.9
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			2.3	0.8				11.1		0.3
Delay (s)	40.6	11.8			23.8	0.8				47.4		29.2
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.2			12.7			0.0			42.5	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1511	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1511	659			
Volume (vph)	153	1196	0	0	1817	455	603	226	1178	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1196	0	0	1817	455	603	226	1178	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	86	11	0	0	0
Lane Group Flow (vph)	153	1196	0	0	1817	177	603	729	578	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	508	335			
v/s Ratio Prot	0.09	c0.34			c0.39		0.36	0.48	c0.88			
v/s Ratio Perm						0.13						
v/c Ratio	0.45	0.80			1.08	0.36	1.07	1.44	1.73			
Uniform Delay, d1	39.4	28.0			35.0	25.6	36.5	36.5	27.0			
Progression Factor	1.53	0.39			0.95	1.62	1.00	1.00	1.00			
Incremental Delay, d2	2.8	3.1			40.0	0.9	57.1	207.2	339.0			
Delay (s)	63.3	14.1			73.2	42.3	93.6	243.7	366.0			
Level of Service	E	B			E	D	F	F	F			
Approach Delay (s)		19.7			67.0			234.5			0.0	
Approach LOS		B			E			F			A	

Intersection Summary				
HCM Average Control Delay	115.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.45			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1809	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1809	2628
Volume (vph)	438	1191	745	325	1274	256	132	16	66	238	163	759
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	438	1191	745	325	1274	256	132	16	66	238	163	759
RTOR Reduction (vph)	0	0	143	0	0	27	0	0	58	0	0	92
Lane Group Flow (vph)	438	1191	602	325	1274	229	72	76	8	0	401	667
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.13	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.22	0.25
v/s Ratio Perm						0.14			0.01			
v/c Ratio	0.82	1.17	1.07	1.19	1.20	0.48	0.34	0.35	0.04		0.81	0.59
Uniform Delay, d1	45.1	38.5	29.5	46.5	38.5	31.5	43.8	43.8	42.1		37.4	24.2
Progression Factor	1.20	1.01	1.05	1.07	1.08	1.15	1.02	1.02	2.08		0.91	0.71
Incremental Delay, d2	1.4	78.1	33.8	107.9	96.8	2.6	0.7	0.7	0.1		12.3	2.1
Delay (s)	55.6	116.9	64.9	157.7	138.4	38.7	45.5	45.6	87.7		46.5	19.2
Level of Service	E	F	E	F	F	D	D	D	F		D	B
Approach Delay (s)		89.2			128.0			58.5			28.7	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	88.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	788	0	0	0	0	1122	25	0	297	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1181	26	0	313	0
RTOR Reduction (vph)	0	0	196	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	633	0	0	0	0	1206	0	0	313	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.23					c0.34			0.17	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.38					0.58			0.51	
Uniform Delay, d1	25.4	25.4	11.4					14.3			29.9	
Progression Factor	1.23	1.20	1.73					1.00			1.32	
Incremental Delay, d2	0.7	0.3	0.1					1.2			3.0	
Delay (s)	31.8	30.8	19.8					15.5			42.4	
Level of Service	C	C	B					B			D	
Approach Delay (s)		22.7			0.0			15.5			42.4	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3366		1770	3480		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3366		1770	3480		1770	1849		1770	1863	1540
Volume (vph)	206	842	276	23	751	59	543	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	886	291	24	791	62	572	633	28	73	314	158
RTOR Reduction (vph)	0	28	0	0	6	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1149	0	24	847	0	572	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	906		55	728		624	652		357	376	311
v/s Ratio Prot	0.12	c0.34		0.01	c0.24		0.32	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.27		0.44	1.16		0.92	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		34.1	35.6		36.5	42.1	35.8
Progression Factor	1.25	1.03		1.00	1.00		1.08	1.07		1.23	1.18	2.42
Incremental Delay, d2	186.9	128.2		5.5	88.5		17.0	36.6		0.2	13.0	0.1
Delay (s)	249.6	169.7		57.8	132.0		53.8	74.8		45.2	62.9	86.8
Level of Service	F	F		E	F		D	E		D	E	F
Approach Delay (s)		182.2			130.0			65.1			67.4	
Approach LOS		F			F			E			E	

Intersection Summary				
HCM Average Control Delay	119.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.2%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3430		1770	3484		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3430		1770	3484		1770	3494		1770	3481	
Volume (vph)	181	728	189	106	523	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	766	199	112	551	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	26	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	939	0	112	605	0	195	1585	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.4		8.4	22.8		13.1	31.3		9.9	28.1	
Effective Green, g (s)	10.0	25.9		7.4	23.3		12.1	31.8		8.9	28.6	
Actuated g/C Ratio	0.11	0.29		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	987		146	902		238	1235		175	1106	
v/s Ratio Prot	c0.11	c0.27		0.06	0.17		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.95		0.77	0.67		0.82	1.28		0.67	1.31	
Uniform Delay, d1	39.8	31.4		40.5	29.9		37.9	29.1		39.2	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	18.1		21.1	2.0		19.3	133.8		9.8	146.4	
Delay (s)	94.5	49.5		61.6	31.9		57.2	162.9		49.0	177.1	
Level of Service	F	D		E	C		E	F		D	F	
Approach Delay (s)		56.9			36.4			151.3			167.5	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	119.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	94.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3401		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3401		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	707	203	158	756	107	238	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	744	214	166	796	113	251	362	178	273	418	20
RTOR Reduction (vph)	0	27	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	931	0	166	796	29	251	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	782		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.27		c0.09	c0.22		0.14	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.19		1.34	0.86	0.07	0.53	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.2	27.8	31.0	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	98.3		196.8	10.4	0.4	0.8	73.9			212.2	
Delay (s)	50.8	136.8		243.3	45.6	28.2	31.8	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		134.0			74.3			85.4			248.7	
Approach LOS		F			E			F			F	

Intersection Summary					
HCM Average Control Delay	128.1	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.30				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	113.3%	ICU Level of Service		H	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3460		1770	3539	1494	1770	1863	1520	1770	1833	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3460		1770	3539	1494	1770	1863	1520	1770	1833	
Volume (vph)	46	928	129	143	794	240	214	392	133	309	582	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	136	151	836	253	225	413	140	325	613	54
RTOR Reduction (vph)	0	11	0	0	0	156	0	0	99	0	3	0
Lane Group Flow (vph)	48	1102	0	151	836	97	225	413	41	325	664	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.5	29.5	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1090		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.18	c0.36	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	1.01		0.74	0.62	0.17	1.06	0.76	0.09	1.53	1.25	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.4	44.0	32.4	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	6.8	30.0		12.8	2.1	0.6	79.0	6.1	0.1	252.1	120.1	
Delay (s)	53.4	64.3		55.6	27.1	21.1	123.0	38.5	26.0	294.1	154.0	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		63.8			29.4			60.7			199.9	
Approach LOS		E			C			E			F	

Intersection Summary					
HCM Average Control Delay	85.3	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	96.9%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1294	44	96	1195	13	33	12	98	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1362	46	101	1258	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1272			1408			2276	2905	704	2304	2922	636
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1272			1408			2276	2905	704	2304	2922	636
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			79			0	0	73	0	26	98
cM capacity (veh/h)	542			480			7	12	379	0	11	421

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	908	500	101	839	433	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	542	1700	1700	480	1700	1700	7	135	0
Volume to Capacity	0.04	0.53	0.29	0.21	0.49	0.25	5.47	0.81	Err
Queue Length 95th (ft)	3	0	0	20	0	0	Err	126	Err
Control Delay (s)	11.9	0.0	0.0	14.5	0.0	0.0	Err	97.3	Err
Lane LOS	B			B			F	F	F
Approach Delay (s)	0.2			1.1			2797.8		Err
Approach LOS							F		F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3421		1770	3494			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3421		1770	3494			1814	1555		1814	
Volume (vph)	32	1187	216	158	1030	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1249	227	166	1084	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	13	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1463	0	166	1144	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1095		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.43		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.34		0.78	0.91			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	30.6			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.59			1.00	1.00		1.00	
Incremental Delay, d2	0.6	157.5		1.7	1.3			101.1	0.6		10.7	
Delay (s)	43.6	191.5		52.0	19.6			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		188.2			23.7			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary				
HCM Average Control Delay	105.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.14			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	104.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3310		1770	3392		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3310		1770	3392		3433	3532		1770	3482	
Volume (vph)	223	854	429	47	600	187	537	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	899	452	49	632	197	565	1415	16	298	1511	123
RTOR Reduction (vph)	0	61	0	0	30	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1290	0	49	799	0	565	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		5.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	957		81	644		446	1286		250	1306	
v/s Ratio Prot	c0.13	c0.39		0.03	0.24		0.16	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.35		0.60	1.24		1.27	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.61	0.91		0.97	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	157.2		7.5	119.9		136.9	61.8		118.9	117.4	
Delay (s)	30.6	189.7		53.0	158.9		180.4	93.6		161.8	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		166.1			153.0			118.2			150.7	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	144.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	113.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3460			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3460			3110			2395	
Volume (vph)	47	989	17	45	668	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1041	18	47	703	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	19	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1057	0	47	788	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1792			603			465	
v/s Ratio Prot	c0.03	c0.30		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.58		0.58	0.44			0.62			0.82	
Uniform Delay, d1	23.3	8.2		23.4	7.5			18.4			19.3	
Progression Factor	1.03	1.41		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.8			1.9			11.2	
Delay (s)	24.6	11.7		30.0	8.3			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.3			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	15.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.94			0.96			0.91	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1770	1833			1734			1768			1669	
Flt Permitted	0.28	1.00			0.87			0.90			0.88	
Satd. Flow (perm)	518	1833			1537			1606			1487	
Volume (vph)	539	95	11	86	105	140	19	83	50	167	59	515
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	567	100	12	91	111	147	20	87	53	176	62	542
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	91	0
Lane Group Flow (vph)	567	107	0	0	320	0	0	140	0	0	689	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			732			677	
v/s Ratio Prot	c0.25	0.06										
v/s Ratio Perm	c0.26				0.21			0.09			c0.46	
v/c Ratio	1.10	0.13			1.10			0.19			1.02	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	70.9	0.1			83.2			0.1			39.1	
Delay (s)	92.2	14.2			119.7			14.7			63.6	
Level of Service	F	B			F			B			E	
Approach Delay (s)		79.3			119.7			14.7			63.6	
Approach LOS		E			F			B			E	

Intersection Summary				
HCM Average Control Delay	75.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	114.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00			0.97	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1760			1801	1583		1787			1805	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.97	
Satd. Flow (perm)	1770	1760			1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	748	0	0	574	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	17.6	17.6			8.5	8.5		31.5			31.5	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary				
HCM Average Control Delay	86.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	110.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	216	36	0	1616	92	0	1807	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1701	97	0	1902	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1794	0	0	2014	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.51			c0.57	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.91			1.02	
Uniform Delay, d1		43.5			42.5			20.6			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			7.7			25.8	
Delay (s)		120.0			47.1			28.3			48.8	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			28.3			48.8	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	48.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2549			5077	
Volume (vph)	0	0	0	64	561	803	49	1106	0	0	1826	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	591	845	52	1164	0	0	1922	22
RTOR Reduction (vph)	0	0	0	0	0	61	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	784	0	1216	0	0	1943	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1558			3103	
v/s Ratio Prot					0.19						0.38	
v/s Ratio Perm						c0.50		c0.48				
v/c Ratio					0.62	1.65		0.78			0.63	
Uniform Delay, d1					27.1	31.5		13.0			11.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	302.1		3.9			1.0	
Delay (s)					27.9	333.6		17.0			12.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			199.8			17.0			12.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	73.8	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	90.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 PM Plus Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3503		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3503		3433	3539	
Volume (vph)	28	861	78	0	0	0	0	1073	78	927	999	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1129	82	976	1052	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1206	0	976	1052	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						38.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.35		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2381	
v/s Ratio Prot		c0.29						c0.34		c0.28	0.30	
v/s Ratio Perm												
v/c Ratio		1.14						0.97		1.01	0.44	
Uniform Delay, d1		41.0						35.0		39.5	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						19.5		31.2	0.0	
Delay (s)		116.5						54.5		70.7	8.4	
Level of Service		F						D		E	A	
Approach Delay (s)		116.5			0.0			54.5			38.4	
Approach LOS		F			A			D			D	

Intersection Summary				
HCM Average Control Delay	61.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	144	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	157	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	491	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	491	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	85	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	384	531	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	160	12
Volume Left	0	153	0	1
Volume Right	0	1	157	3
cSH	1604	1605	1046	591
Volume to Capacity	0.00	0.10	0.15	0.02
Queue Length 95th (ft)	0	8	13	2
Control Delay (s)	0.0	6.9	9.1	11.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.1	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	30.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Project Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	79	46	13	150	67	256	13	421	240	90	537	75	346	29	43	249	235	16

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	138	473	674	702	375	292	251
Delay	49.9	1.7	57.2	39.7	2.2	64.3	68.1
LOS	D	A	E	D	A	E	E

HCM Average Control Delay	**53.1**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Project SAT
5/7/2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.88			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1860	1583	1770	1828	
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1641			1632	1583	1770	1828	
Volume (vph)	79	46	13	150	67	256	13	421	240	90	537	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	50	14	163	73	278	14	458	261	98	584	82
RTOR Reduction (vph)	0	9	0	0	107	0	0	0	167	0	4	0
Lane Group Flow (vph)	86	55	0	163	244	0	0	472	94	98	662	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	10.2	10.2		42.0	42.0			33.2	33.2	10.3	47.5	
Effective Green, g (s)	10.2	10.2		42.0	42.0			33.2	33.2	10.3	47.5	
Actuated g/C Ratio	0.09	0.09		0.38	0.38			0.30	0.30	0.09	0.43	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	162	165		666	617			485	471	163	777	
v/s Ratio Prot	c0.05	0.03		0.09	c0.15					0.06	c0.36	
v/s Ratio Perm								c0.29	0.06			
v/c Ratio	0.53	0.33		0.24	0.40			0.97	0.20	0.60	0.85	
Uniform Delay, d1	48.5	47.6		24.0	25.5			38.8	29.3	48.7	28.9	
Progression Factor	1.00	1.00		0.15	0.03			1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.9		0.0	0.1			33.8	0.2	4.2	8.8	
Delay (s)	51.0	48.4		3.6	0.9			72.6	29.5	53.0	37.8	
Level of Service	D	D		A	A			E	C	D	D	
Approach Delay (s)		49.9			1.7			57.2			39.7	
Approach LOS		D			A			E			D	

Intersection Summary				
HCM Average Control Delay	37.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	111.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	92.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Project SAT
5/7/2007

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1843		1770	1863	1764	
Flt Permitted	1.00		0.21	1.00	0.96	
Satd. Flow (perm)	1843		390	1863	1764	
Volume (vph)	346	29	43	249	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	376	32	47	271	245	17
RTOR Reduction (vph)	3	0	0	0	2	0
Lane Group Flow (vph)	405	0	47	271	260	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	84.8		19.1	19.1	18.9	
Effective Green, g (s)	84.8		19.1	19.1	18.9	
Actuated g/C Ratio	0.76		0.17	0.17	0.17	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1399		67	319	298	
v/s Ratio Prot	c0.22			c0.15	c0.15	
v/s Ratio Perm			0.12			
v/c Ratio	0.29		0.70	0.85	0.87	
Uniform Delay, d1	4.2		43.6	44.9	45.2	
Progression Factor	0.52		1.00	1.00	1.00	
Incremental Delay, d2	0.1		26.4	18.3	22.8	
Delay (s)	2.2		70.0	63.3	68.1	
Level of Service	A		E	E	E	
Approach Delay (s)	2.2			64.3	68.1	
Approach LOS	A			E	E	

Intersection Summary				
HCM Average Control Delay	39.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	111.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	128	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	139	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	237	133
Volume Left (vph)	0	108	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.11	-0.20	0.04
Departure Headway (s)	4.4	4.9	4.2	4.6
Degree Utilization, x	0.02	0.17	0.28	0.17
Capacity (veh/h)	726	685	818	748
Control Delay (s)	7.5	8.9	8.9	8.5
Approach Delay (s)	7.5	8.9	8.9	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
HCM Level of Service			A	
Intersection Capacity Utilization			34.8%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	70	24	13	647	602	106
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	26	14	703	654	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.78	0.78	0.78			
vC, conflicting volume	1443	712	770			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1570	630	704			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	18	93	98			
cM capacity (veh/h)	93	375	696			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	102	14	703	770
Volume Left	76	14	0	0
Volume Right	26	0	0	115
cSH	115	696	1700	1700
Volume to Capacity	0.89	0.02	0.41	0.45
Queue Length 95th (ft)	136	2	0	0
Control Delay (s)	126.2	10.3	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	126.2	0.2		0.0
Approach LOS	F			

Intersection Summary					
Average Delay			8.2		
Intersection Capacity Utilization			50.1%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1645		1770	3539	1488		3459	
Flt Permitted		0.97	1.00	0.95	0.97		0.33	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1645		612	3539	1488		3201	
Volume (vph)	31	22	136	873	78	72	143	296	363	25	398	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	949	85	78	155	322	395	27	433	68
RTOR Reduction (vph)	0	0	78	0	6	0	0	0	270	0	10	0
Lane Group Flow (vph)	0	58	70	575	531	0	155	322	125	0	518	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	38.7	38.7		35.3	35.3	35.3		35.3	
Effective Green, g (s)		24.5	24.5	38.7	38.7		34.8	34.8	34.8		34.8	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.32	0.32	0.32		0.32	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	591	579		194	1120	471		1013	
v/s Ratio Prot		0.03		c0.34	0.32			0.09				
v/s Ratio Perm			c0.04				c0.25		0.08		0.16	
v/c Ratio		0.14	0.20	0.97	0.92		0.80	0.29	0.27		0.51	
Uniform Delay, d1		34.3	34.8	35.1	34.1		34.4	28.3	28.1		30.7	
Progression Factor		1.00	1.00	0.59	0.57		0.57	0.56	0.37		1.00	
Incremental Delay, d2		0.7	1.3	27.5	17.3		21.8	0.5	1.0		1.8	
Delay (s)		35.1	36.0	48.1	36.8		41.3	16.4	11.5		32.5	
Level of Service		D	D	D	D		D	B	B		C	
Approach Delay (s)		35.8			42.6			18.6			32.5	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	32.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	327	67	691	863	360	348
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	355	73	751	938	391	378
RTOR Reduction (vph)	0	35	0	0	0	20
Lane Group Flow (vph)	355	38	751	938	391	358
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	25.2	57.5	28.8	77.8	45.5	74.2
Effective Green, g (s)	24.7	57.0	28.3	77.3	45.0	73.7
Actuated g/C Ratio	0.22	0.52	0.26	0.70	0.41	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	397	820	883	1309	762	1061
v/s Ratio Prot	c0.20	0.02	c0.22	c0.50	0.21	0.23
v/s Ratio Perm						
v/c Ratio	0.89	0.05	0.85	0.72	0.51	0.34
Uniform Delay, d1	41.4	13.1	38.8	9.8	24.3	7.7
Progression Factor	0.60	0.55	0.55	1.93	1.00	1.00
Incremental Delay, d2	19.5	0.0	4.3	1.8	2.5	0.2
Delay (s)	44.6	7.2	25.7	20.6	26.8	7.9
Level of Service	D	A	C	C	C	A
Approach Delay (s)	38.2			22.9	17.5	
Approach LOS	D			C	B	

Intersection Summary				
HCM Average Control Delay	23.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	70.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1837	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1837	
Volume (vph)	26	21	7	803	13	16	41	328	1152	135	470	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	873	14	17	45	357	1252	147	511	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	459	444	0	45	357	1252	147	543	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	660	
v/s Ratio Prot	0.02	0.01		0.27	0.26		0.03	0.10		0.08	0.30	
v/s Ratio Perm			0.00						c0.79			
v/c Ratio	0.38	0.30	0.01	0.80	0.78		0.53	0.34	0.79	0.75	0.82	
Uniform Delay, d1	35.2	35.1	34.7	22.6	22.3		35.1	20.7	0.0	32.6	22.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	7.8	6.3		2.7	0.1	4.1	13.6	8.0	
Delay (s)	36.4	35.9	34.7	30.5	28.7		37.8	20.9	4.1	46.2	30.0	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			29.6			8.6			33.4	
Approach LOS		D			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	70.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			3031	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			3031	1399				3433		1583
Volume (vph)	115	309	31	0	418	1418	0	0	0	1034	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1541	0	0	0	1124	0	282
RTOR Reduction (vph)	0	6	0	0	114	0	0	0	0	0	0	160
Lane Group Flow (vph)	125	364	0	0	735	1146	0	0	0	1124	0	122
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	60.9			45.5	110.0				40.6		40.6
Effective Green, g (s)	11.4	60.9			45.5	110.0				41.1		41.1
Actuated g/C Ratio	0.10	0.55			0.41	1.00				0.37		0.37
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1932			1254	1399				1283		591
v/s Ratio Prot	0.07	0.10			0.24							0.08
v/s Ratio Perm						c0.82				0.33		
v/c Ratio	0.68	0.19			0.59	0.82				0.88		0.21
Uniform Delay, d1	47.6	12.2			25.0	0.0				32.1		23.4
Progression Factor	1.00	1.00			0.89	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.7				6.9		0.1
Delay (s)	55.7	12.5			23.3	2.7				39.0		23.5
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.4			11.5			0.0			35.9	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	123	1219	0	0	1409	464	427	21	1391	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1325	0	0	1532	504	464	23	1512	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	324	0	162	2	0	0	0
Lane Group Flow (vph)	134	1325	0	0	1532	180	464	617	754	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.37			0.33		0.28	0.43	c1.14			
v/s Ratio Perm						0.12						
v/c Ratio	0.77	1.11			0.93	0.35	0.63	0.98	1.94			
Uniform Delay, d1	48.4	36.5			34.0	26.0	24.1	30.4	22.5			
Progression Factor	1.20	0.62			1.06	1.98	1.00	1.00	1.00			
Incremental Delay, d2	14.4	58.5			7.1	1.1	4.1	30.5	431.5			
Delay (s)	72.2	81.1			43.2	52.5	28.2	61.0	454.0			
Level of Service	E	F			D	D	C	E	F			
Approach Delay (s)		80.2			45.5			202.0			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	111.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1818	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1818	2628
Volume (vph)	441	946	1230	350	751	248	227	62	101	260	270	889
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	479	1028	1337	380	816	270	247	67	110	283	293	966
RTOR Reduction (vph)	0	50	85	0	0	66	0	0	98	0	0	27
Lane Group Flow (vph)	479	1488	742	380	816	204	153	161	12	0	576	939
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		496	1266
v/s Ratio Prot	0.14	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.32	0.36
v/s Ratio Perm						0.13			0.01			
v/c Ratio	0.81	1.48	1.42	1.39	0.77	0.45	0.84	0.86	0.07		1.16	0.74
Uniform Delay, d1	43.7	37.5	31.5	46.5	35.0	31.1	48.0	48.2	44.0		40.0	23.0
Progression Factor	1.14	0.93	0.84	1.00	1.00	1.00	1.26	1.26	2.47		0.81	0.43
Incremental Delay, d2	1.1	214.9	191.6	195.1	5.3	3.1	23.7	26.6	0.1		86.4	2.5
Delay (s)	50.9	249.6	218.2	241.6	40.4	34.3	84.3	87.3	108.7		118.9	12.5
Level of Service	D	F	F	F	D	C	F	F	F		F	B
Approach Delay (s)		207.0			91.4			91.8			52.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	134.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1534	21	0	420	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1667	23	0	457	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1689	0	0	457	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.48			0.25	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.91			0.53	
Uniform Delay, d1	21.7	21.7	25.2					23.6			21.3	
Progression Factor	1.04	1.04	1.10					0.56			0.58	
Incremental Delay, d2	0.7	0.3	3.5					5.8			2.2	
Delay (s)	23.1	22.9	31.1					19.1			14.5	
Level of Service	C	C	C					B			B	
Approach Delay (s)		28.9			0.0			19.1			14.5	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3343		1770	3507		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3343		1770	3507		1770	1839		1770	1863	1549
Volume (vph)	101	686	356	40	743	38	294	288	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	746	387	43	808	41	320	313	24	40	308	107
RTOR Reduction (vph)	0	90	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1043	0	43	844	0	320	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Effective Green, g (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Actuated g/C Ratio	0.06	0.29		0.03	0.27		0.22	0.22		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	106	985		61	944		386	401		375	395	328
v/s Ratio Prot	c0.06	c0.31		0.02	0.24		0.18	c0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.04	1.06		0.70	0.89		0.83	0.83		0.11	0.78	0.07
Uniform Delay, d1	31.2	23.4		31.8	23.4		24.8	24.8		21.1	24.7	21.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	97.9	45.5		30.9	10.8		13.7	13.6		0.1	9.4	0.1
Delay (s)	129.2	69.0		62.6	34.2		38.5	38.4		21.2	34.1	21.0
Level of Service	F	E		E	C		D	D		C	C	C
Approach Delay (s)		74.3			35.6			38.5			29.9	
Approach LOS		E			D			D			C	

Intersection Summary				
HCM Average Control Delay	50.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	78.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3420		1770	3520			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3420		1770	3520			1809	1555		1785	
Volume (vph)	19	1222	226	175	1309	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1328	246	190	1423	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	2	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1561	0	190	1456	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1228		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.46		0.11	c0.41			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.27		0.97	0.90			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	25.0			37.8	31.0		39.8	
Progression Factor	0.94	0.72		0.81	0.70			1.00	1.00		1.00	
Incremental Delay, d2	237.8	128.1		12.7	0.9			59.1	0.4		0.6	
Delay (s)	284.2	151.2		48.7	18.3			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		153.0			21.8			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	83.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

2030 Plus Project SAT
12/21/2006

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3082		1770	3384		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3082		1770	3384		3433	3516		1770	3354	
Volume (vph)	192	775	468	72	665	109	615	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	842	509	78	723	118	668	1205	27	170	1276	228
RTOR Reduction (vph)	0	89	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1262	0	78	828	0	668	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	995		83	805		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.41		0.04	0.24		c0.19	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.27		0.94	1.03		1.22	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.35	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	121.7		77.0	39.3		113.4	25.6		18.3	200.1	
Delay (s)	61.8	130.9		124.5	77.4		155.4	58.1		61.1	234.6	
Level of Service	E	F		F	E		F	E		E	F	
Approach Delay (s)		121.7			81.4			92.3			217.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	132.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	113.9%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #2
BASE YEAR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3388		1770	3522		1770	3433		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3388		1770	3522		1770	3433		1770	1863	1583
Volume (vph)	500	775	309	102	616	20	85	170	42	59	182	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	336	111	670	22	92	185	46	64	198	202
RTOR Reduction (vph)	0	33	0	0	2	0	0	21	0	0	0	173
Lane Group Flow (vph)	543	1145	0	111	690	0	92	210	0	64	198	29
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	55.1		10.6	31.1		11.4	11.4		15.9	15.9	15.9
Effective Green, g (s)	34.6	56.1		10.6	32.1		11.4	11.4		15.9	15.9	15.9
Actuated g/C Ratio	0.31	0.51		0.10	0.29		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1728		171	1028		183	356		256	269	229
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.05	c0.06		0.04	c0.11	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.66		0.65	0.67		0.50	0.59		0.25	0.74	0.13
Uniform Delay, d1	37.3	19.9		47.9	34.3		46.6	47.1		41.8	45.0	41.0
Progression Factor	1.00	1.00		0.78	1.47		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.0		6.9	2.9		1.6	2.2		0.5	10.0	0.3
Delay (s)	68.8	22.0		44.5	53.2		48.2	49.3		42.3	55.1	41.3
Level of Service	E	C		D	D		D	D		D	E	D
Approach Delay (s)		36.7			52.0			49.0			47.3	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	43.1	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3446		1770	3500		1770	3467	
Flt Permitted	0.20	1.00			0.69		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	370	3458			2383		1770	3500		1770	3467	
Volume (vph)	70	670	121	41	521	103	130	490	40	113	628	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	45	566	112	141	533	43	123	683	108
RTOR Reduction (vph)	0	16	0	0	16	0	0	5	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	707	0	141	571	0	123	782	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.4	34.4			34.4		13.2	46.6		16.0	49.4	
Effective Green, g (s)	34.4	34.4			34.4		13.2	47.6		16.0	50.4	
Actuated g/C Ratio	0.31	0.31			0.31		0.12	0.43		0.15	0.46	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	116	1081			745		212	1515		257	1589	
v/s Ratio Prot		0.24					c0.08	0.16		0.07	c0.23	
v/s Ratio Perm	0.21				c0.30							
v/c Ratio	0.66	0.78			0.95		0.67	0.38		0.48	0.49	
Uniform Delay, d1	32.7	34.4			36.9		46.3	21.2		43.2	20.8	
Progression Factor	0.54	0.59			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.9	2.9			21.0		7.6	0.7		1.4	1.1	
Delay (s)	27.6	23.1			58.0		53.9	21.9		44.6	21.9	
Level of Service	C	C			E		D	C		D	C	
Approach Delay (s)		23.5			58.0			28.2			25.0	
Approach LOS		C			E			C			C	

Intersection Summary			
HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	64	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	70	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	302	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	302	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	94	100	100	100
cM capacity (veh/h)	1542			1616			693	633	1079	585	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	72	1
Volume Left	0	84	2	0
Volume Right	2	1	70	0
cSH	1542	1616	1061	633
Volume to Capacity	0.00	0.05	0.07	0.00
Queue Length 95th (ft)	0	4	5	0
Control Delay (s)	0.0	4.4	8.6	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.6	10.7
Approach LOS			A	B

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	46	5	63	47	36	11	70	50	105	132	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	50	5	68	51	39	12	76	54	114	143	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	48	55	68	90	142	114	241
Volume Left (vph)	48	0	68	0	12	114	0
Volume Right (vph)	0	5	0	39	54	0	98
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.18	0.53	-0.25
Departure Headway (s)	6.6	6.0	6.5	5.7	5.5	6.0	5.2
Degree Utilization, x	0.09	0.09	0.12	0.14	0.22	0.19	0.35
Capacity (veh/h)	507	554	517	589	622	578	669
Control Delay (s)	9.0	8.4	9.2	8.4	10.0	9.2	9.7
Approach Delay (s)	8.7		8.8		10.0	9.5	
Approach LOS	A		A		B	A	

Intersection Summary				
Delay	9.4			
HCM Level of Service	A			
Intersection Capacity Utilization	33.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	201	0	0	146	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	218	0	0	159	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			218		377	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		377	218
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1351		624	821

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	218	159	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1351	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	13.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.99		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1815		1770	1850		1770	1837	
Flt Permitted		0.93			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1601			1462		1770	1850		1770	1837	
Volume (vph)	39	58	132	37	50	4	36	271	13	23	385	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	63	143	40	54	4	39	295	14	25	418	42
RTOR Reduction (vph)	0	98	0	0	3	0	0	3	0	0	6	0
Lane Group Flow (vph)	0	150	0	0	95	0	39	306	0	25	454	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		320			292		85	1003		32	941	
v/s Ratio Prot							c0.02	0.17		0.01	c0.25	
v/s Ratio Perm		c0.09			0.06							
v/c Ratio		0.47			0.32		0.46	0.31		0.78	0.48	
Uniform Delay, d1		17.7			17.1		23.2	6.3		24.5	7.9	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		0.8			0.5		2.8	0.8		72.6	1.8	
Delay (s)		18.4			17.6		23.6	8.4		97.1	9.7	
Level of Service		B			B		C	A		F	A	
Approach Delay (s)		18.4			17.6			10.1			14.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	63	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	68	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	128	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.10	0.00
Departure Headway (s)	4.2	4.6	4.1	4.3
Degree Utilization, x	0.01	0.11	0.15	0.11
Capacity (veh/h)	804	744	839	816
Control Delay (s)	7.3	8.1	7.9	7.8
Approach Delay (s)	7.3	8.1	7.9	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	19	17	125	170	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	21	18	136	185	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	375	202	220			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	375	202	220			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	98	99			
cM capacity (veh/h)	618	839	1350			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	46	18	136	220
Volume Left	25	18	0	0
Volume Right	21	0	0	35
cSH	701	1350	1700	1700
Volume to Capacity	0.07	0.01	0.08	0.13
Queue Length 95th (ft)	5	1	0	0
Control Delay (s)	10.5	7.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.5	0.9		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.98		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3403		3539	1583		3529
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3403		3539	1583		3290
Volume (vph)	248	30	278	289	17	273
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	33	302	314	18	297
RTOR Reduction (vph)	10	0	0	170	0	0
Lane Group Flow (vph)	293	0	302	144	0	315
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1565		1628	728		1513
v/s Ratio Prot	c0.09		0.09			
v/s Ratio Perm				0.09		c0.10
v/c Ratio	0.19		0.19	0.20		0.21
Uniform Delay, d1	16.0		15.9	16.0		16.1
Progression Factor	0.61		0.13	1.90		1.00
Incremental Delay, d2	0.3		0.2	0.4		0.3
Delay (s)	10.0		2.2	30.9		16.4
Level of Service	A		A	C		B
Approach Delay (s)	10.0		16.9			16.4
Approach LOS	A		B			B

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	246	15	223	157	65	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	16	242	171	71	112
RTOR Reduction (vph)	0	11	0	0	0	91
Lane Group Flow (vph)	267	5	242	171	71	21
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.1	34.4	11.8	73.9	58.6	19.1
Effective Green, g (s)	18.6	33.9	11.3	73.4	58.1	18.6
Actuated g/C Ratio	0.19	0.34	0.11	0.73	0.58	0.19
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	329	537	388	1367	1082	294
v/s Ratio Prot	c0.15	0.00	c0.07	c0.09	0.04	0.01
v/s Ratio Perm						
v/c Ratio	0.81	0.01	0.62	0.13	0.07	0.07
Uniform Delay, d1	39.0	21.9	42.3	3.9	9.1	33.6
Progression Factor	1.11	2.98	0.73	0.20	1.00	1.00
Incremental Delay, d2	13.5	0.0	3.1	0.2	0.1	0.1
Delay (s)	56.8	65.3	33.8	1.0	9.2	33.7
Level of Service	E	E	C	A	A	C
Approach Delay (s)	57.3			20.2	24.2	
Approach LOS	E			C	C	

Intersection Summary				
HCM Average Control Delay	33.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	33.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1705		1770	3539	1583	1770	1794	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1705		1770	3539	1583	1770	1794	
Volume (vph)	5	21	16	570	79	0	88	36	606	60	219	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	620	86	0	96	39	659	65	238	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	23	1	344	362	0	96	39	659	65	304	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.7	2.7	2.7	18.4	18.4		4.5	16.2	56.6	3.8	15.5	
Effective Green, g (s)	2.2	2.2	2.2	18.4	18.4		4.0	16.7	56.6	3.3	16.0	
Actuated g/C Ratio	0.04	0.04	0.04	0.33	0.33		0.07	0.30	1.00	0.06	0.28	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	69	72	62	546	554		125	1044	1583	103	507	
v/s Ratio Prot	0.00	0.01		0.20	c0.21		c0.05	0.01		0.04	c0.17	
v/s Ratio Perm			0.00						c0.42			
v/c Ratio	0.07	0.32	0.01	0.63	0.65		0.77	0.04	0.42	0.63	0.60	
Uniform Delay, d1	26.2	26.5	26.2	16.2	16.4		25.8	14.2	0.0	26.1	17.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.1	2.5		22.0	0.0	0.8	8.9	1.6	
Delay (s)	26.4	27.4	26.2	18.3	18.8		47.9	14.2	0.8	35.0	19.1	
Level of Service	C	C	C	B	B		D	B	A	C	B	
Approach Delay (s)		26.8			18.6			7.2			21.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	722	0	0	0	663	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	785	0	0	0	721	0	139
RTOR Reduction (vph)	0	68	0	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	129	373	0	0	739	785	0	0	0	721	0	35
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	67.0			44.0	100.0				24.5		24.5
Effective Green, g (s)	19.0	67.0			44.0	100.0				25.0		25.0
Actuated g/C Ratio	0.19	0.67			0.44	1.00				0.25		0.25
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2206			1492	1441				858		396
v/s Ratio Prot	0.07	0.11			0.22					c0.21		
v/s Ratio Perm						c0.54						0.02
v/c Ratio	0.38	0.17			0.50	0.54				0.84		0.09
Uniform Delay, d1	35.4	6.1			20.0	0.0				35.6		28.8
Progression Factor	1.00	1.00			0.85	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.0				7.3		0.1
Delay (s)	35.7	6.3			17.9	1.0				42.9		28.8
Level of Service	D	A			B	A				D		C
Approach Delay (s)		12.9			9.2			0.0			40.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1464	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1464	1504			
Volume (vph)	74	806	0	0	813	291	589	2	1135	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	876	0	0	884	316	640	2	1234	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	215	0	97	51	0	0	0
Lane Group Flow (vph)	80	876	0	0	884	101	556	569	603	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	556	677			
v/s Ratio Prot	0.05	c0.17			c0.19		0.33	c0.39	c0.40			
v/s Ratio Perm						0.06						
v/c Ratio	0.25	0.37			0.60	0.20	0.87	1.02	0.89			
Uniform Delay, d1	35.2	17.0			28.6	24.7	28.7	31.0	25.3			
Progression Factor	0.53	0.54			0.47	0.24	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.4			1.5	0.8	12.6	44.4	14.2			
Delay (s)	20.3	9.6			15.0	6.8	41.3	75.4	39.5			
Level of Service	C	A			B	A	D	E	D			
Approach Delay (s)		10.5			12.9			52.8			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1808	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1808	2628
Volume (vph)	517	1105	319	45	595	108	42	3	42	71	45	480
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	1201	347	49	647	117	46	3	46	77	49	522
RTOR Reduction (vph)	0	0	162	0	0	27	0	0	43	0	0	201
Lane Group Flow (vph)	562	1201	185	49	647	90	24	25	3	0	126	321
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	43.0	53.9	5.1	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	42.5	53.4	4.6	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.42	0.53	0.05	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1441	769	81	956	427	116	117	109		542	1317
v/s Ratio Prot	0.16	c0.35	c0.13	0.03	c0.18		0.01	0.01			0.07	c0.12
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.81	0.83	0.24	0.60	0.68	0.21	0.21	0.21	0.03		0.23	0.24
Uniform Delay, d1	38.2	25.6	12.5	46.8	32.6	28.3	44.0	44.0	43.4		26.3	14.2
Progression Factor	1.12	0.57	0.36	0.74	0.68	0.61	1.00	1.00	1.00		1.12	2.95
Incremental Delay, d2	7.3	4.1	0.1	7.4	3.3	1.0	0.6	0.7	0.1		1.0	0.4
Delay (s)	50.1	18.6	4.6	42.1	25.4	18.2	44.6	44.7	43.5		30.6	42.3
Level of Service	D	B	A	D	C	B	D	D	D		C	D
Approach Delay (s)		24.7			25.4			44.1			40.1	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3525			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3525			1863	
Volume (vph)	35	26	200	6	0	20	0	342	9	0	85	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	372	10	0	92	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	380	0	0	92	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	3				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1502			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.11			0.05	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.25			0.14	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.5			22.8	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.53	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.4			0.5	
Delay (s)	17.0	17.0	14.7	47.7		47.0		18.9			35.5	
Level of Service	B	B	B	D		D		B			D	
Approach Delay (s)		15.2			47.1			18.9			35.5	
Approach LOS		B			D			B			D	

Intersection Summary				
HCM Average Control Delay	20.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.16			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3333		1770	3471		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3333		1770	3471		1770	1827		1770	1863	1583
Volume (vph)	355	341	216	34	403	60	230	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	371	235	37	438	65	250	188	28	28	153	101
RTOR Reduction (vph)	0	76	0	0	12	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	530	0	37	491	0	250	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	30.5	47.3		5.7	22.5		18.5	18.5		13.5	13.5	13.5
Effective Green, g (s)	30.0	47.8		5.2	23.0		18.0	18.0		13.0	13.0	13.0
Actuated g/C Ratio	0.30	0.48		0.05	0.23		0.18	0.18		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	531	1593		92	798		319	329		230	242	206
v/s Ratio Prot	c0.22	0.16		0.02	c0.14		c0.14	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.73	0.33		0.40	0.62		0.78	0.64		0.12	0.63	0.06
Uniform Delay, d1	31.3	16.2		45.9	34.5		39.1	38.0		38.5	41.2	38.2
Progression Factor	0.55	0.73		1.00	1.00		0.98	0.97		0.86	0.90	1.15
Incremental Delay, d2	3.2	0.4		2.9	3.5		11.9	4.0		0.2	5.2	0.1
Delay (s)	20.5	12.2		48.8	38.1		50.1	41.0		33.3	42.2	43.8
Level of Service	C	B		D	D		D	D		C	D	D
Approach Delay (s)		15.4			38.8			45.9			41.9	
Approach LOS		B			D			D			D	

Intersection Summary					
HCM Average Control Delay	30.5	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	66.2%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3358		1770	3510		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3358		1770	3510		1770	3479		1770	3498	
Volume (vph)	68	172	89	89	381	22	103	447	57	49	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	187	97	97	414	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	77	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	207	0	97	433	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	14.1		9.0	16.7		11.4	54.7		7.2	50.5	
Effective Green, g (s)	5.4	14.6		8.0	17.2		10.4	55.2		6.2	51.0	
Actuated g/C Ratio	0.05	0.15		0.08	0.17		0.10	0.55		0.06	0.51	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	490		142	604		184	1920		110	1784	
v/s Ratio Prot	0.04	0.06		c0.05	c0.12		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.42		0.68	0.72		0.61	0.28		0.48	0.39	
Uniform Delay, d1	46.7	38.9		44.8	39.1		42.9	11.9		45.3	15.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.6		12.7	4.1		5.6	0.4		3.3	0.6	
Delay (s)	77.6	39.5		57.5	43.2		48.5	12.3		48.6	15.6	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		47.3			45.8			18.4			18.0	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM Average Control Delay	29.1	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3443		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3443		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	166	37	43	295	61	47	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	180	40	47	321	66	51	58	33	3	25	10
RTOR Reduction (vph)	0	11	0	0	0	27	0	25	0	0	9	0
Lane Group Flow (vph)	26	209	0	47	321	39	51	66	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	56.3		5.4	58.5	58.5	10.4	10.4			13.4	
Effective Green, g (s)	2.7	56.3		4.9	58.5	58.5	9.9	9.9			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.10	0.10			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1938		87	2070	926	175	174			231	
v/s Ratio Prot	0.01	0.06		c0.03	c0.09		0.03	c0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.11		0.54	0.16	0.04	0.29	0.38			0.13	
Uniform Delay, d1	48.0	10.2		46.4	9.5	8.8	41.8	42.2			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	0.7	1.0			0.2	
Delay (s)	57.5	10.3		51.8	9.6	8.9	42.5	43.2			38.7	
Level of Service	E	B		D	A	A	D	D			D	
Approach Delay (s)		15.3			14.1			42.9			38.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3434		1770	3539	1583	1770	1863	1583	1770	1841	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3434		1770	3539	1583	1770	1863	1583	1770	1841	
Volume (vph)	28	152	38	51	372	165	117	226	39	54	121	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	41	55	404	179	127	246	42	59	132	11
RTOR Reduction (vph)	0	17	0	0	0	89	0	0	34	0	3	0
Lane Group Flow (vph)	30	189	0	55	404	90	127	246	8	59	140	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	48.1		7.0	50.5	50.5	11.6	23.0	18.8	7.4	18.8	
Effective Green, g (s)	4.1	48.1		6.5	50.5	50.5	11.1	22.5	18.3	6.9	18.3	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.11	0.22	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1652		115	1787	799	196	419	290	122	337	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.07	c0.13		0.03	0.08	
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.41	0.11		0.48	0.23	0.11	0.65	0.59	0.03	0.48	0.41	
Uniform Delay, d1	46.8	14.3		45.1	13.8	13.0	42.6	34.6	33.5	44.8	36.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.07	0.92	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.3	6.4	1.7	0.0	2.2	0.6	
Delay (s)	49.5	14.4		47.4	14.1	13.3	48.9	36.3	33.6	50.0	33.9	
Level of Service	D	B		D	B	B	D	D	C	D	C	
Approach Delay (s)		18.9			16.8			39.9			38.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	203	16	90	562	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	221	17	98	611	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	634			238			785	1111	119	1068	1108	317
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	634			238			785	1111	119	1068	1108	317
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			89	92	91	98	98	100
cM capacity (veh/h)	945			1326			258	187	910	140	188	679

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	147	91	98	407	226	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	945	1700	1700	1326	1700	1700	239	694	189
Volume to Capacity	0.03	0.09	0.05	0.07	0.24	0.13	0.15	0.13	0.03
Queue Length 95th (ft)	2	0	0	6	0	0	13	11	3
Control Delay (s)	8.9	0.0	0.0	7.9	0.0	0.0	22.6	10.9	24.7
Lane LOS	A			A			C	B	C
Approach Delay (s)	0.9			1.1			14.3		24.7
Approach LOS							B		C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.98			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3498		1770	3486			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3498		1770	3486			850	1583		1568	
Volume (vph)	3	249	21	69	477	53	85	66	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	271	23	75	518	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	5	0	0	6	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	289	0	75	570	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.49		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1725		122	1945			183	340		99	
v/s Ratio Prot	0.00	c0.08		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.17		0.61	0.29			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.0		45.3	11.7			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.04	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.3	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.2		53.3	7.3			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.6			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	43.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3373		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3401		1770	3373		3433	3533		1770	3500	
Volume (vph)	92	203	72	29	301	137	238	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	221	78	32	327	149	259	776	9	147	736	59
RTOR Reduction (vph)	0	42	0	0	56	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	257	0	32	420	0	259	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	17.2		9.1	17.5		15.0	48.3		12.4	45.7	
Effective Green, g (s)	7.8	16.2		8.1	16.5		14.0	48.3		11.4	45.7	
Actuated g/C Ratio	0.08	0.16		0.08	0.16		0.14	0.48		0.11	0.46	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	551		143	557		481	1706		202	1600	
v/s Ratio Prot	c0.06	0.08		0.02	c0.12		0.08	c0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.22	0.75		0.54	0.46		0.73	0.49	
Uniform Delay, d1	45.1	38.0		43.0	39.8		40.0	17.2		42.8	19.0	
Progression Factor	1.27	1.26		1.17	1.17		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.6	0.5		0.3	5.0		0.6	0.9		10.5	1.1	
Delay (s)	72.0	48.4		50.6	51.6		40.6	18.1		53.3	20.1	
Level of Service	E	D		D	D		D	B		D	C	
Approach Delay (s)		54.3			51.6			23.7			25.3	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	33.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3488		1770	3485			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3488		1770	3485			3189			2945	
Volume (vph)	48	274	29	6	396	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	298	32	7	430	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	318	0	7	465	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2044		21	1917			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.13							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.24			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.8			18.3			19.3	
Progression Factor	0.51	1.48		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.2	7.1		27.9	6.1			18.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.9			6.5			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	41.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	99	50	2	8	67	26	2	1	2	16	4	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	54	2	9	73	28	2	1	2	17	4	79

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	108	57	110	5	101
Volume Left (vph)	108	0	9	2	17
Volume Right (vph)	0	2	28	2	79
Hadj (s)	0.53	0.01	-0.10	-0.13	-0.40
Departure Headway (s)	5.4	4.8	4.3	4.5	4.2
Degree Utilization, x	0.16	0.08	0.13	0.01	0.12
Capacity (veh/h)	657	722	797	736	808
Control Delay (s)	8.2	7.0	8.0	7.6	7.7
Approach Delay (s)	7.8		8.0	7.6	7.7
Approach LOS	A		A	A	A

Intersection Summary				
Delay	7.8			
HCM Level of Service	A			
Intersection Capacity Utilization	24.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.18	0.18			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	

Intersection Summary						
HCM Average Control Delay	23.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	45.6	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	36.8%	ICU Level of Service		A		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3504			3478	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3504			3478	
Volume (vph)	51	103	9	77	117	20	0	877	62	0	692	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	953	67	0	752	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1016	0	0	843	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2295	
v/s Ratio Prot					c0.07			c0.29			0.24	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.44			0.37	
Uniform Delay, d1		44.2			44.1			8.5			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.2			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.2			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3534			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3293			5073	
Volume (vph)	0	0	0	65	296	663	12	433	0	0	676	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	471	0	0	735	12
RTOR Reduction (vph)	0	0	0	0	0	245	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	476	0	484	0	0	745	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					31.9	31.9		59.1			59.1	
Effective Green, g (s)					31.9	31.9		60.1			60.1	
Actuated g/C Ratio					0.32	0.32		0.60			0.60	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1119	505		1979			3049	
v/s Ratio Prot					0.11						0.15	
v/s Ratio Perm						c0.30		c0.15				
v/c Ratio					0.35	0.94		0.24			0.24	
Uniform Delay, d1					26.1	33.2		9.3			9.3	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	26.0		0.3			0.2	
Delay (s)					26.2	59.1		9.6			9.5	
Level of Service					C	E		A			A	
Approach Delay (s)		0.0			47.5			9.6			9.5	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3479		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3479		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	427	54	221	488	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	464	59	240	530	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	515	0	240	530	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						38.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1943		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.26		0.48	0.20	
Uniform Delay, d1		28.4						8.0		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.3	0.0	
Delay (s)		28.7						8.3		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.3			10.3	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3445		1770	3504		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3445		1770	3504		1770	3421		1770	1863	1583
Volume (vph)	263	614	132	105	745	52	173	404	116	130	254	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	143	114	810	57	188	439	126	141	276	501
RTOR Reduction (vph)	0	15	0	0	4	0	0	24	0	0	0	317
Lane Group Flow (vph)	286	795	0	114	863	0	188	541	0	141	276	184
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	42.4		11.5	33.5		19.4	19.4		19.7	19.7	19.7
Effective Green, g (s)	20.4	43.4		11.5	34.5		19.4	19.4		19.7	19.7	19.7
Actuated g/C Ratio	0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1359		185	1099		312	603		317	334	284
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.11	c0.16		0.08	c0.15	
v/s Ratio Perm												0.12
v/c Ratio	0.87	0.58		0.62	0.79		0.60	0.90		0.44	0.83	0.65
Uniform Delay, d1	43.5	26.2		47.1	34.4		41.7	44.3		40.3	43.5	41.9
Progression Factor	1.00	1.00		1.34	0.66		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	1.8		4.7	4.5		2.4	14.0		1.0	15.3	5.0
Delay (s)	65.1	28.1		68.0	27.2		43.7	58.2		41.3	58.8	47.0
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		37.7			31.9			54.6			49.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3437		1770	3497		1770	3470	
Flt Permitted	0.14	1.00			0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	255	3426			2862		1770	3497		1770	3470	
Volume (vph)	96	588	159	22	608	142	172	898	78	181	775	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	24	661	154	187	976	85	197	842	127
RTOR Reduction (vph)	0	27	0	0	21	0	0	5	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	818	0	187	1056	0	197	960	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.6	34.6			34.6		15.2	47.4		15.0	47.2	
Effective Green, g (s)	34.6	34.6			34.6		15.2	48.4		15.0	48.2	
Actuated g/C Ratio	0.31	0.31			0.31		0.14	0.44		0.14	0.44	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	80	1078			900		245	1539		241	1520	
v/s Ratio Prot		0.23					c0.11	c0.30		c0.11	0.28	
v/s Ratio Perm	c0.41				0.29							
v/c Ratio	1.30	0.73			0.91		0.76	0.69		0.82	0.63	
Uniform Delay, d1	37.7	33.5			36.2		45.7	24.7		46.2	24.0	
Progression Factor	1.05	1.06			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	190.5	2.0			12.8		13.2	2.5		18.9	2.0	
Delay (s)	230.2	37.4			48.9		58.8	27.2		65.1	26.0	
Level of Service	F	D			D		E	C		E	C	
Approach Delay (s)		59.3			48.9			32.0			32.6	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM Average Control Delay	41.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	140	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	152	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	459	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	459	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	86	100	100	100
cM capacity (veh/h)	1598			1595			603	556	1057	410	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	155	2
Volume Left	1	133	2	1
Volume Right	0	0	152	0
cSH	1598	1595	1039	472
Volume to Capacity	0.00	0.08	0.15	0.00
Queue Length 95th (ft)	0	7	13	0
Control Delay (s)	0.4	6.6	9.1	12.7
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.1	12.7
Approach LOS			A	B

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	29.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	101	78	6	136	85	106	10	396	227	16	163	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	85	7	148	92	115	11	430	247	17	177	72

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	110	91	148	208	688	17	249
Volume Left (vph)	110	0	148	0	11	17	0
Volume Right (vph)	0	7	0	115	247	0	72
Hadj (s)	0.53	-0.02	0.53	-0.35	-0.18	0.53	-0.17
Departure Headway (s)	8.4	7.9	8.1	7.2	6.7	8.0	7.3
Degree Utilization, x	0.26	0.20	0.33	0.42	1.28	0.04	0.50
Capacity (veh/h)	409	437	430	484	546	436	471
Control Delay (s)	13.1	11.7	13.9	14.1	160.7	10.1	16.2
Approach Delay (s)	12.5		14.0		160.7	15.8	
Approach LOS	B		B		F	C	

Intersection Summary			
Delay	80.9		
HCM Level of Service	F		
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	321	0	0	327	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	349	0	0	355	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			349		704	349
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			349		704	349
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1210		403	694

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	349	355	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1210	1700
Volume to Capacity	0.21	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	20.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1760			1793		1770	1843		1770	1757	
Flt Permitted		0.82			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1477			1577		1770	1843		1770	1757	
Volume (vph)	138	153	68	36	87	20	163	604	39	19	317	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	166	74	39	95	22	177	657	42	21	345	130
RTOR Reduction (vph)	0	16	0	0	11	0	0	4	0	0	25	0
Lane Group Flow (vph)	0	374	0	0	145	0	177	695	0	21	450	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.4			16.4		7.4	25.7		1.4	19.7	
Effective Green, g (s)		15.9			15.9		6.9	26.2		0.9	20.2	
Actuated g/C Ratio		0.29			0.29		0.13	0.48		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		427			456		222	878		29	645	
v/s Ratio Prot							c0.10	c0.38		0.01	0.26	
v/s Ratio Perm		c0.25			0.09							
v/c Ratio		0.88			0.32		0.80	0.79		0.72	0.70	
Uniform Delay, d1		18.6			15.3		23.4	12.1		26.9	14.8	
Progression Factor		1.00			1.00		0.90	1.04		0.98	1.06	
Incremental Delay, d2		17.8			0.3		14.6	6.1		53.6	5.5	
Delay (s)		36.4			15.6		35.7	18.7		80.0	21.2	
Level of Service		D			B		D	B		F	C	
Approach Delay (s)		36.4			15.6			22.1			23.7	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	144	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	157	72	5	128	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	68	247	135
Volume Left (vph)	4	57	18	5
Volume Right (vph)	64	12	72	1
Hadj (s)	-0.42	0.09	-0.13	0.04
Departure Headway (s)	4.4	5.0	4.3	4.6
Degree Utilization, x	0.10	0.09	0.30	0.17
Capacity (veh/h)	734	661	803	743
Control Delay (s)	8.0	8.5	9.1	8.5
Approach Delay (s)	8.0	8.5	9.1	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.7		
HCM Level of Service	A		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	54	34	18	570	271	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	37	20	620	295	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	974	315	336			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	974	315	336			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	95	98			
cM capacity (veh/h)	275	725	1223			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	96	20	620	336
Volume Left	59	20	0	0
Volume Right	37	0	0	41
cSH	362	1223	1700	1700
Volume to Capacity	0.26	0.02	0.36	0.20
Queue Length 95th (ft)	26	1	0	0
Control Delay (s)	18.5	8.0	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.5	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3397		3539	1488		3526
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3397		3539	1488		3245
Volume (vph)	727	57	386	167	24	437
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	790	62	420	182	26	475
RTOR Reduction (vph)	5	0	0	99	0	0
Lane Group Flow (vph)	847	0	420	83	0	501
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1606		1609	676		1475
v/s Ratio Prot	c0.25		0.12			
v/s Ratio Perm				0.06		c0.15
v/c Ratio	0.53		0.26	0.12		0.34
Uniform Delay, d1	20.4		18.6	17.3		19.4
Progression Factor	0.59		0.14	0.00		1.00
Incremental Delay, d2	1.1		0.3	0.3		0.6
Delay (s)	13.1		2.9	0.3		20.0
Level of Service	B		A	A		B
Approach Delay (s)	13.1		2.1			20.0
Approach LOS	B		A			B

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	150	34	472	606	197	312
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	37	513	659	214	339
RTOR Reduction (vph)	0	21	0	0	0	206
Lane Group Flow (vph)	163	16	513	659	214	133
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	15.6	47.3	28.2	87.4	55.7	15.6
Effective Green, g (s)	15.1	46.8	27.7	86.9	55.2	15.1
Actuated g/C Ratio	0.14	0.43	0.25	0.79	0.50	0.14
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	673	864	1472	935	217
v/s Ratio Prot	c0.09	0.01	c0.15	c0.35	0.11	0.08
v/s Ratio Perm						
v/c Ratio	0.67	0.02	0.59	0.45	0.23	0.61
Uniform Delay, d1	45.1	18.3	36.2	3.8	15.4	44.7
Progression Factor	0.52	0.04	0.79	0.27	1.00	1.00
Incremental Delay, d2	7.0	0.0	0.9	0.8	0.6	5.0
Delay (s)	30.5	0.8	29.5	1.8	16.0	49.7
Level of Service	C	A	C	A	B	D
Approach Delay (s)	25.0			14.0	36.7	
Approach LOS	C			B	D	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Volume (vph)	172	370	60	423	14	0	11	641	1179	252	518	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	460	15	0	12	697	1282	274	563	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	231	244	0	12	697	1282	274	611	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.5	16.5	16.5	16.5	16.5		1.1	22.7	87.5	16.3	37.9	
Effective Green, g (s)	16.0	16.0	16.0	16.5	16.5		0.6	23.2	87.5	15.8	38.4	
Actuated g/C Ratio	0.18	0.18	0.18	0.19	0.19		0.01	0.27	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	324	341	289	317	319		12	938	1583	320	801	
v/s Ratio Prot	0.11	c0.22		0.14	0.14		0.01	0.20		0.15	0.33	
v/s Ratio Perm			0.03						c0.81			
v/c Ratio	0.58	1.18	0.17	0.73	0.76		1.00	0.74	0.81	0.86	0.76	
Uniform Delay, d1	32.7	35.8	30.1	33.4	33.7		43.4	29.4	0.0	34.7	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	106.7	0.1	7.6	10.0		259.8	3.0	4.6	18.9	4.2	
Delay (s)	34.2	142.5	30.2	41.0	43.7		303.3	32.5	4.6	53.7	24.9	
Level of Service	C	F	C	D	D		F	C	A	D	C	
Approach Delay (s)		100.4			42.4			16.2			33.8	
Approach LOS		F			D			B			C	

Intersection Summary				
HCM Average Control Delay	36.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			2991	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			2991	1399				3433		1583
Volume (vph)	140	394	572	0	521	1592	0	0	0	714	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	1730	0	0	0	776	0	359
RTOR Reduction (vph)	0	205	0	0	160	0	0	0	0	0	0	262
Lane Group Flow (vph)	152	845	0	0	1017	1119	0	0	0	776	0	97
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	72.4			48.4	110.0				29.1		29.1
Effective Green, g (s)	20.0	72.4			48.4	110.0				29.6		29.6
Actuated g/C Ratio	0.18	0.66			0.44	1.00				0.27		0.27
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2123			1316	1399				924		426
v/s Ratio Prot	0.09	0.26			0.34							0.06
v/s Ratio Perm						c0.80				0.23		
v/c Ratio	0.47	0.40			0.77	0.80				0.84		0.23
Uniform Delay, d1	40.3	8.7			26.1	0.0				38.0		31.3
Progression Factor	1.00	1.00			0.60	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			0.4	0.5				6.7		0.2
Delay (s)	40.7	9.3			16.1	0.5				44.6		31.5
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.2			8.5			0.0			40.5	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	17.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1527	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1527	659			
Volume (vph)	141	967	0	0	1563	459	550	226	880	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1051	0	0	1699	499	598	246	957	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	64	18	0	0	0
Lane Group Flow (vph)	153	1051	0	0	1699	236	598	660	461	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	514	335			
v/s Ratio Prot	0.09	c0.30			c0.37		0.36	0.43	c0.70			
v/s Ratio Perm						0.18						
v/c Ratio	0.45	0.71			1.01	0.48	1.06	1.28	1.38			
Uniform Delay, d1	39.4	26.4			35.0	27.0	36.5	36.5	27.0			
Progression Factor	1.55	0.39			0.95	1.30	1.00	1.00	1.00			
Incremental Delay, d2	3.5	2.3			18.4	2.0	54.3	142.3	186.8			
Delay (s)	64.6	12.5			51.7	37.0	90.8	178.8	213.8			
Level of Service	E	B			D	D	F	F	F			
Approach Delay (s)		19.1			48.4			158.9			0.0	
Approach LOS		B			D			F			A	

Intersection Summary				
HCM Average Control Delay	79.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.22			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1812	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1812	2628
Volume (vph)	411	765	671	259	989	163	132	16	66	206	163	786
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	447	832	729	282	1075	177	143	17	72	224	177	854
RTOR Reduction (vph)	0	7	140	0	0	22	0	0	63	0	0	85
Lane Group Flow (vph)	447	918	496	282	1075	155	78	82	9	0	401	769
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	0.13	0.28	c0.41	0.16	c0.30		0.05	0.05			c0.22	0.29
v/s Ratio Perm						0.10			0.01			
v/c Ratio	0.84	0.92	0.88	1.03	1.01	0.33	0.36	0.38	0.05		0.81	0.68
Uniform Delay, d1	45.2	37.2	26.7	46.5	38.5	29.9	43.9	44.0	42.1		37.4	25.5
Progression Factor	1.24	0.96	0.97	1.00	1.00	1.00	1.02	1.02	2.14		0.64	0.24
Incremental Delay, d2	4.1	4.5	4.1	62.1	30.7	1.8	0.7	0.8	0.1		12.4	3.1
Delay (s)	60.3	40.1	30.0	108.6	69.2	31.7	45.7	45.8	90.1		36.3	9.3
Level of Service	E	D	C	F	E	C	D	D	F		D	A
Approach Delay (s)		41.4			72.1			59.5			17.9	
Approach LOS		D			E			E			B	

Intersection Summary				
HCM Average Control Delay	45.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	907	25	0	231	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	986	27	0	251	0
RTOR Reduction (vph)	0	0	414	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	359	51	0	7	0	1011	0	0	251	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.13	c0.03				c0.29			0.13	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.28	0.42		0.07		0.63			0.38	
Uniform Delay, d1	23.1	23.0	18.1	49.2		48.0		23.0			26.2	
Progression Factor	1.23	1.22	3.47	1.00		1.00		1.00			1.49	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		1.9			1.6	
Delay (s)	28.8	28.3	62.9	50.9		48.2		24.9			40.5	
Level of Service	C	C	E	D		D		C			D	
Approach Delay (s)		54.9			49.1			24.9			40.5	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM Average Control Delay	40.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3423		1770	3466		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3423		1770	3466		1770	1843		1770	1863	1537
Volume (vph)	169	688	136	20	560	55	477	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	748	148	22	609	60	518	455	29	63	215	170
RTOR Reduction (vph)	0	14	0	0	7	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	882	0	22	662	0	518	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.9	30.8		2.6	22.5		45.6	45.6		16.0	16.0	16.0
Effective Green, g (s)	10.4	31.3		2.1	23.0		45.1	45.1		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	167	974		34	725		726	756		249	263	217
v/s Ratio Prot	c0.10	c0.26		0.01	c0.19		c0.29	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.10	0.91		0.65	0.91		0.71	0.64		0.25	0.82	0.11
Uniform Delay, d1	49.8	37.9		53.6	42.5		27.1	25.9		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.99	1.00		1.07	1.04	1.76
Incremental Delay, d2	99.5	13.4		35.3	17.9		3.3	1.8		0.5	16.7	0.2
Delay (s)	149.3	51.3		88.8	60.4		30.0	27.6		45.6	64.3	72.9
Level of Service	F	D		F	E		C	C		D	E	E
Approach Delay (s)		68.0			61.3			28.8			64.9	
Approach LOS		E			E			C			E	

Intersection Summary				
HCM Average Control Delay	54.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3410		1770	3464		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3410		1770	3464		1770	3483		1770	3483	
Volume (vph)	128	578	186	100	365	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	628	202	109	397	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	35	0	0	16	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	795	0	109	447	0	152	1179	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.2		8.4	22.2		11.9	32.4		10.0	30.5	
Effective Green, g (s)	9.4	24.7		7.4	22.7		10.9	32.9		9.0	31.0	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.12	0.37		0.10	0.34	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	936		146	874		214	1273		177	1200	
v/s Ratio Prot	c0.08	c0.23		0.06	0.13		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.85		0.75	0.51		0.71	0.93		0.69	0.87	
Uniform Delay, d1	39.2	30.9		40.4	28.9		38.0	27.4		39.1	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	7.3		18.6	0.5		10.6	12.8		10.6	8.7	
Delay (s)	54.9	38.2		59.0	29.4		48.6	40.2		49.8	36.3	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		40.6			35.0			41.2			37.7	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3397		1770	3539	1524	1770	1684			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3397		1770	3539	1524	1770	1684			1805	
Volume (vph)	24	588	177	80	589	27	182	106	108	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	639	192	87	640	29	198	115	117	46	115	21
RTOR Reduction (vph)	0	20	0	0	0	15	0	42	0	0	5	0
Lane Group Flow (vph)	26	811	0	87	640	15	198	190	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	45.3		7.9	50.0	50.0	16.6	16.6			15.7	
Effective Green, g (s)	2.7	45.3		7.4	50.0	50.0	16.1	16.1			15.2	
Actuated g/C Ratio	0.03	0.45		0.07	0.50	0.50	0.16	0.16			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1539		131	1770	762	285	271			274	
v/s Ratio Prot	0.01	c0.24		c0.05	0.18		0.11	c0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.53		0.66	0.36	0.02	0.69	0.70			0.65	
Uniform Delay, d1	48.0	19.6		45.1	15.3	12.6	39.6	39.7			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.3		10.8	0.6	0.0	6.6	7.4			4.6	
Delay (s)	57.5	20.9		55.9	15.8	12.7	46.2	47.1			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		22.1			20.3			46.7			44.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	66.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3425		1770	3539	1496	1770	1863	1520	1770	1812	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3425		1770	3539	1496	1770	1863	1520	1770	1812	
Volume (vph)	46	544	116	141	498	153	181	273	115	165	306	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	126	153	541	166	197	297	125	179	333	55
RTOR Reduction (vph)	0	16	0	0	0	96	0	0	95	0	6	0
Lane Group Flow (vph)	50	701	0	153	541	70	197	297	30	179	382	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	36.8		12.2	42.3	42.3	12.5	24.4	24.4	12.1	24.0	
Effective Green, g (s)	6.2	36.8		11.7	42.3	42.3	12.0	23.9	23.9	11.6	23.5	
Actuated g/C Ratio	0.06	0.37		0.12	0.42	0.42	0.12	0.24	0.24	0.12	0.24	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1260		207	1497	633	212	445	363	205	426	
v/s Ratio Prot	0.03	c0.20		c0.09	0.15		c0.11	0.16		0.10	c0.21	
v/s Ratio Perm						0.05			0.02			
v/c Ratio	0.45	0.56		0.74	0.36	0.11	0.93	0.67	0.08	0.87	0.90	
Uniform Delay, d1	45.3	25.1		42.7	19.7	17.5	43.6	34.5	29.5	43.5	37.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.96	
Incremental Delay, d2	2.2	1.8		12.2	0.7	0.4	42.0	3.4	0.1	29.8	20.1	
Delay (s)	47.4	26.9		54.9	20.3	17.8	85.5	37.8	29.6	72.0	55.8	
Level of Service	D	C		D	C	B	F	D	C	E	E	
Approach Delay (s)		28.2			26.0			51.4			60.9	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM Average Control Delay	39.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	748	44	96	785	12	33	12	98	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	813	48	104	853	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	866			861			1534	1960	430	1636	1977	433
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	866			861			1534	1960	430	1636	1977	433
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			87			40	75	81	100	83	98
cM capacity (veh/h)	773			777			60	53	573	39	51	571

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	542	319	104	569	297	42	113	18
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	773	1700	1700	777	1700	1700	59	365	99
Volume to Capacity	0.03	0.32	0.19	0.13	0.33	0.17	0.72	0.31	0.19
Queue Length 95th (ft)	2	0	0	12	0	0	78	32	16
Control Delay (s)	9.8	0.0	0.0	10.4	0.0	0.0	159.1	19.2	49.5
Lane LOS	A			B			F	C	E
Approach Delay (s)	0.3			1.1			57.4		49.5
Approach LOS							F		E

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3449		1770	3479			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3449		1770	3479			1808	1555		1811	
Volume (vph)	30	756	101	124	706	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	822	110	135	767	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	924	0	135	824	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	37.6		11.3	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.6		10.8	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.08	0.38		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1297		191	1399			380	327		264	
v/s Ratio Prot	0.02	c0.27		c0.08	0.24			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.71		0.71	0.59			0.86	0.22		0.71	
Uniform Delay, d1	42.9	26.6		43.1	23.4			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.18	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	3.3		4.3	0.7			17.8	0.3		7.8	
Delay (s)	43.5	29.9		55.4	15.2			55.9	33.0		48.4	
Level of Service	D	C		E	B			E	C		D	
Approach Delay (s)		30.4			20.8			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM Average Control Delay	31.6	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	76.1%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3296		1770	3368		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3296		1770	3368		3433	3529		1770	3467	
Volume (vph)	205	526	290	46	385	146	405	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	572	315	50	418	159	440	1035	16	241	1052	111
RTOR Reduction (vph)	0	74	0	0	40	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	813	0	50	537	0	440	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	28.4		5.7	18.6		14.0	37.6		15.3	38.9	
Effective Green, g (s)	14.5	27.4		4.7	17.6		13.0	37.6		14.3	38.9	
Actuated g/C Ratio	0.14	0.27		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	903		83	593		446	1327		253	1349	
v/s Ratio Prot	c0.13	c0.25		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.87	0.90		0.60	0.90		0.99	0.79		0.95	0.86	
Uniform Delay, d1	41.8	35.0		46.7	40.4		43.4	27.7		42.5	28.0	
Progression Factor	0.63	0.78		1.03	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.6	9.5		7.9	16.4		38.6	4.9		43.1	7.2	
Delay (s)	45.8	36.8		56.2	53.7		82.1	32.6		85.6	35.1	
Level of Service	D	D		E	D		F	C		F	D	
Approach Delay (s)		38.6			53.9			47.2			43.8	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	45.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3438			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3438			3156			2746	
Volume (vph)	16	646	16	9	447	89	19	212	23	75	166	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	702	17	10	486	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	24	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	716	0	10	559	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1967			549			478	
v/s Ratio Prot	c0.01	c0.20		0.01	0.16							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.35		0.48	0.28			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.23		1.00	1.00			1.00			1.00	
Incremental Delay, d2	20.8	0.2		6.1	0.4			0.6			1.9	
Delay (s)	45.3	7.2		30.6	5.8			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.1			6.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	271	75	11	86	78	46	19	83	50	65	59	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	295	82	12	93	85	50	21	90	54	71	64	201

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	295	93	228	165	336
Volume Left (vph)	295	0	93	21	71
Volume Right (vph)	0	12	50	54	201
Hadj (s)	0.53	-0.06	-0.02	-0.14	-0.28
Departure Headway (s)	7.1	6.5	6.4	6.4	5.9
Degree Utilization, x	0.58	0.17	0.41	0.30	0.55
Capacity (veh/h)	488	528	505	489	571
Control Delay (s)	18.0	9.5	13.7	12.1	15.8
Approach Delay (s)	16.0		13.7	12.1	15.8
Approach LOS	C		B	B	C

Intersection Summary				
Delay	14.9			
HCM Level of Service	B			
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	

Intersection Summary					
HCM Average Control Delay	11.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	46.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3509			3500	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3509			3500	
Volume (vph)	73	162	14	96	123	36	0	1108	66	0	1214	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1204	72	0	1320	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1273	0	0	1419	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2160	
v/s Ratio Prot					c0.08			0.36			c0.41	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.59			0.66	
Uniform Delay, d1		42.7			43.5			12.1			12.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.6	
Delay (s)		46.7			45.4			13.2			14.5	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.2			14.5	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3183			5073	
Volume (vph)	0	0	0	64	237	549	19	813	0	0	1201	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	884	0	0	1305	22
RTOR Reduction (vph)	0	0	0	0	0	114	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	483	0	905	0	0	1325	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1945			3100	
v/s Ratio Prot					0.09						0.26	
v/s Ratio Perm						c0.30		c0.28				
v/c Ratio					0.31	1.02		0.47			0.43	
Uniform Delay, d1					24.3	31.5		9.5			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	45.5		0.8			0.4	
Delay (s)					24.4	77.0		10.3			9.6	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			58.4			10.3			9.6	
Approach LOS		A			E			B			A	

Intersection Summary				
HCM Average Control Delay	24.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3491		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3491		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	780	78	592	709	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	848	85	643	771	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	927	0	643	771	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	78.2	
Effective Green, g (s)		23.8						49.1		25.1	78.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1558		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.22	
v/s Ratio Perm												
v/c Ratio		0.82						0.59		0.82	0.31	
Uniform Delay, d1		41.1						23.0		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.7		6.6	0.0	
Delay (s)		48.0						24.6		46.9	5.9	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.6			24.6	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	124	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	135	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	337	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			208	201	13	337	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	87	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	515	658	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	138	12
Volume Left	0	87	0	1
Volume Right	0	1	135	3
cSH	1604	1605	1052	714
Volume to Capacity	0.00	0.05	0.13	0.02
Queue Length 95th (ft)	0	4	11	1
Control Delay (s)	0.0	6.4	8.9	10.1
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	8.9	10.1
Approach LOS			A	B

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	26.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	35	13	112	42	20	13	339	216	17	238	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	38	14	122	46	22	14	368	235	18	259	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	76	52	122	67	617	18	301
Volume Left (vph)	76	0	122	0	14	18	0
Volume Right (vph)	0	14	0	22	235	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.19	0.53	-0.06
Departure Headway (s)	8.1	7.4	7.9	7.2	6.0	7.1	6.5
Degree Utilization, x	0.17	0.11	0.27	0.14	1.03	0.04	0.54
Capacity (veh/h)	423	460	434	478	604	495	545
Control Delay (s)	11.6	10.1	12.6	10.2	68.9	9.1	15.7
Approach Delay (s)	11.0		11.8		68.9	15.3	
Approach LOS	B		B		F	C	

Intersection Summary				
Delay	40.7			
HCM Level of Service	E			
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

Existing Plus Alt#2 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	17	0	0	20	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	0	0	22	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			18		40	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			18		40	18
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1598		971	1060

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	18	22	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1598	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	6.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	108	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	117	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	192	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	-0.49	0.00	-0.18	0.04
Departure Headway (s)	4.0	4.5	4.0	4.3
Degree Utilization, x	0.02	0.08	0.21	0.08
Capacity (veh/h)	828	751	878	799
Control Delay (s)	7.1	7.9	8.1	7.7
Approach Delay (s)	7.1	7.9	8.1	7.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.9	
HCM Level of Service			A	
Intersection Capacity Utilization		28.5%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

Existing Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	45	23	12	566	332	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	25	13	615	361	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1024	383	404			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1024	383	404			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	96	99			
cM capacity (veh/h)	258	665	1154			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	74	13	615	404
Volume Left	49	13	0	0
Volume Right	25	0	0	43
cSH	325	1154	1700	1700
Volume to Capacity	0.23	0.01	0.36	0.24
Queue Length 95th (ft)	21	1	0	0
Control Delay (s)	19.3	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.3	0.2		0.0
Approach LOS	C			

Intersection Summary				
Average Delay			1.4	
Intersection Capacity Utilization		40.4%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

Existing Plus Alt#2 SAT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3386		3539	1492		3524
Flt Permitted	0.96		1.00	1.00		0.91
Satd. Flow (perm)	3386		3539	1492		3227
Volume (vph)	786	76	332	318	26	371
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	854	83	361	346	28	403
RTOR Reduction (vph)	7	0	0	201	0	0
Lane Group Flow (vph)	930	0	361	145	0	431
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.51		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1724		1480	624		1349
v/s Ratio Prot	c0.27		0.10			
v/s Ratio Perm				0.10		c0.13
v/c Ratio	0.54		0.24	0.23		0.32
Uniform Delay, d1	18.3		20.7	20.6		21.5
Progression Factor	0.37		0.60	2.58		1.00
Incremental Delay, d2	1.1		0.3	0.6		0.6
Delay (s)	7.9		12.6	53.8		22.1
Level of Service	A		B	D		C
Approach Delay (s)	7.9		32.8			22.1
Approach LOS	A		C			C

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

Existing Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	277	51	660	795	225	218
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	301	55	717	864	245	237
RTOR Reduction (vph)	0	26	0	0	0	24
Lane Group Flow (vph)	301	29	717	864	245	213
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	24.0	59.0	31.5	79.0	44.0	71.5
Effective Green, g (s)	23.5	58.5	31.0	78.5	43.5	71.0
Actuated g/C Ratio	0.21	0.53	0.28	0.71	0.40	0.65
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	378	842	967	1330	737	1022
v/s Ratio Prot	c0.17	0.02	c0.21	c0.46	0.13	0.13
v/s Ratio Perm						
v/c Ratio	0.80	0.03	0.74	0.65	0.33	0.21
Uniform Delay, d1	41.0	12.3	35.9	8.4	23.1	8.0
Progression Factor	0.36	0.02	0.39	1.29	1.00	1.00
Incremental Delay, d2	10.3	0.0	2.0	1.6	1.2	0.1
Delay (s)	25.1	0.2	16.1	12.5	24.4	8.1
Level of Service	C	A	B	B	C	A
Approach Delay (s)	21.2			14.1	16.4	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Volume (vph)	26	21	7	693	13	16	41	246	836	120	393	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	753	14	17	45	267	909	130	427	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	398	385	0	45	267	909	130	458	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	21.5	21.5		3.6	17.3	65.0	7.6	21.3	
Effective Green, g (s)	2.6	2.6	2.6	21.5	21.5		3.1	17.8	65.0	7.1	21.8	
Actuated g/C Ratio	0.04	0.04	0.04	0.33	0.33		0.05	0.27	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	75	63	556	556		84	969	1583	193	615	
v/s Ratio Prot	0.02	0.01		c0.24	0.23		0.03	0.08		0.07	c0.25	
v/s Ratio Perm			0.00						c0.57			
v/c Ratio	0.39	0.31	0.01	0.72	0.69		0.54	0.28	0.57	0.67	0.75	
Uniform Delay, d1	30.4	30.3	30.0	19.1	18.9		30.2	18.5	0.0	27.8	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.1	3.4		3.3	0.1	1.5	7.1	4.6	
Delay (s)	31.7	31.2	30.0	23.1	22.3		33.5	18.6	1.5	34.9	23.8	
Level of Service	C	C	C	C	C		C	B	A	C	C	
Approach Delay (s)		31.3			22.7			6.4			26.2	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.97	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.94	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3104	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3104	1399				3433		1583
Volume (vph)	113	273	0	0	353	1022	0	0	0	863	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1111	0	0	0	938	0	263
RTOR Reduction (vph)	0	0	0	0	48	0	0	0	0	0	0	181
Lane Group Flow (vph)	123	297	0	0	561	886	0	0	0	938	0	82
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	67.7			52.4	110.0				33.8		33.8
Effective Green, g (s)	11.3	67.7			52.4	110.0				34.3		34.3
Actuated g/C Ratio	0.10	0.62			0.48	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2178			1479	1399				1070		494
v/s Ratio Prot	0.07	0.08			0.18							0.05
v/s Ratio Perm						c0.63				c0.27		
v/c Ratio	0.68	0.14			0.38	0.63				0.88		0.17
Uniform Delay, d1	47.6	8.9			18.4	0.0				35.8		27.5
Progression Factor	1.00	1.00			0.77	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.1			0.6	1.7				8.2		0.1
Delay (s)	55.2	9.0			14.8	1.7				44.0		27.6
Level of Service	E	A			B	A				D		C
Approach Delay (s)		22.5			7.0			0.0			40.4	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1451	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1451	659			
Volume (vph)	111	1025	0	0	1003	415	372	21	1012	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1114	0	0	1090	451	404	23	1100	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	287	0	165	5	0	0	0
Lane Group Flow (vph)	121	1114	0	0	1090	164	404	408	545	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.6	37.0			39.9	39.9	48.0	48.0	65.0			
Effective Green, g (s)	10.1	37.0			39.9	39.9	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	163	1197			1682	529	734	633	389			
v/s Ratio Prot	0.07	c0.31			c0.24		0.24	0.28	c0.83			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	0.93			0.65	0.31	0.55	0.65	1.40			
Uniform Delay, d1	48.7	35.3			29.2	25.2	23.0	24.3	22.5			
Progression Factor	1.17	0.61			0.98	2.09	1.00	1.00	1.00			
Incremental Delay, d2	13.2	12.8			1.6	1.2	3.0	5.0	195.5			
Delay (s)	70.0	34.1			30.2	53.9	26.0	29.3	218.0			
Level of Service	E	C			C	D	C	C	F			
Approach Delay (s)		37.7			37.1			96.4			0.0	
Approach LOS		D			D			F			A	

Intersection Summary			
HCM Average Control Delay	58.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1831	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1831	2628
Volume (vph)	446	450	1141	270	442	147	227	62	101	141	270	737
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	485	489	1240	293	480	160	247	67	110	153	293	801
RTOR Reduction (vph)	0	209	95	0	0	67	0	0	98	0	0	78
Lane Group Flow (vph)	485	900	525	293	480	94	153	161	12	0	446	723
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		499	1266
v/s Ratio Prot	0.14	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.24	0.28
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.82	0.94	1.01	1.07	0.45	0.20	0.84	0.86	0.07		0.89	0.57
Uniform Delay, d1	43.8	36.4	31.5	46.5	31.2	28.7	48.0	48.2	44.0		38.5	20.4
Progression Factor	1.26	0.97	0.99	1.00	1.00	1.00	1.26	1.26	2.47		0.64	0.97
Incremental Delay, d2	3.1	5.5	21.0	74.0	1.4	1.0	23.7	26.6	0.1		19.4	1.7
Delay (s)	58.6	41.0	52.2	120.5	32.6	29.7	84.3	87.3	108.7		44.1	21.4
Level of Service	E	D	D	F	C	C	F	F	F		D	C
Approach Delay (s)		48.0			59.7			91.8			29.5	
Approach LOS		D			E			F			C	

Intersection Summary			
HCM Average Control Delay	49.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3530			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3530			1863	
Volume (vph)	105	218	1025	51	0	120	0	1230	21	0	278	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1337	23	0	302	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1359	0	0	302	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	8.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.38			0.16	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.83			0.46	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		25.7			27.6	
Progression Factor	1.18	1.19	1.55	1.00		1.00		0.69			1.05	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		4.2			2.3	
Delay (s)	29.6	29.3	40.2	50.9		48.1		22.0			31.1	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.6			48.9			22.0			31.1	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	31.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3380		1770	3502		1770	1821		1770	1863	1543
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3380		1770	3502		1770	1821		1770	1863	1543
Volume (vph)	66	441	169	37	572	35	181	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	479	184	40	622	38	197	163	24	38	190	97
RTOR Reduction (vph)	0	45	0	0	6	0	0	8	0	0	0	82
Lane Group Flow (vph)	72	618	0	40	654	0	197	179	0	38	190	15
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	3.1	25.4		1.4	23.7		9.5	9.5		9.3	9.3	9.3
Effective Green, g (s)	3.1	25.4		1.4	23.7		9.5	9.5		9.3	9.3	9.3
Actuated g/C Ratio	0.05	0.41		0.02	0.38		0.15	0.15		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	89	1394		40	1347		273	281		267	281	233
v/s Ratio Prot	c0.04	0.18		0.02	c0.19		c0.11	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.81	0.44		1.00	0.49		0.72	0.64		0.14	0.68	0.06
Uniform Delay, d1	29.0	13.0		30.1	14.3		24.8	24.4		22.7	24.7	22.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.8	0.2		142.3	0.3		9.1	4.6		0.2	6.3	0.1
Delay (s)	68.8	13.2		172.4	14.6		33.8	29.1		22.9	31.0	22.5
Level of Service	E	B		F	B		C	C		C	C	C
Approach Delay (s)		18.7			23.6			31.5			27.5	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3460		1770	3514			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3460		1770	3514			1801	1555		1772	
Volume (vph)	18	828	96	152	913	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	900	104	165	992	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	997	0	165	1023	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1557		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.29		c0.09	0.29			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.64		0.84	0.53			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.3		43.6	14.3			40.0	36.2		39.7	
Progression Factor	1.07	0.41		0.82	0.65			1.00	1.00		1.00	
Incremental Delay, d2	210.0	1.8		17.9	0.7			7.7	0.2		0.4	
Delay (s)	262.9	10.4		53.8	10.0			47.7	36.3		40.0	
Level of Service	F	B		D	A			D	D		D	
Approach Delay (s)		15.4			16.0			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3080		1770	3388		3433	3501		1770	3282	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3080		1770	3388		3433	3501		1770	3282	
Volume (vph)	166	517	315	69	412	65	456	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	562	342	75	448	71	496	701	27	123	743	200
RTOR Reduction (vph)	0	90	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	814	0	75	507	0	496	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.6		5.2	24.7		16.2	35.4		10.8	30.0	
Effective Green, g (s)	12.6	32.6		4.7	24.7		15.7	36.4		10.3	31.0	
Actuated g/C Ratio	0.13	0.33		0.05	0.25		0.16	0.36		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	1004		83	837		539	1274		182	1017	
v/s Ratio Prot	c0.10	c0.26		0.04	0.15		c0.14	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.81		0.90	0.61		0.92	0.57		0.68	0.90	
Uniform Delay, d1	42.5	30.9		47.4	33.3		41.5	25.5		43.2	33.1	
Progression Factor	1.14	0.38		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.4	6.0		66.1	3.2		20.9	1.9		7.6	12.8	
Delay (s)	63.9	17.7		113.5	36.6		62.4	27.4		50.8	45.9	
Level of Service	E	B		F	D		E	C		D	D	
Approach Delay (s)		25.4			46.3			41.6			46.4	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #2
2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3389		1770	3518		1770	3422		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3389		1770	3518		1770	3422		1770	1863	1583
Volume (vph)	514	847	333	104	742	30	116	221	63	61	215	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	351	109	781	32	122	233	66	64	226	208
RTOR Reduction (vph)	0	34	0	0	2	0	0	25	0	0	0	176
Lane Group Flow (vph)	541	1209	0	109	811	0	122	274	0	64	226	32
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	52.5		10.5	28.4		13.1	13.1		16.9	16.9	16.9
Effective Green, g (s)	34.6	53.5		10.5	29.4		13.1	13.1		16.9	16.9	16.9
Actuated g/C Ratio	0.31	0.49		0.10	0.27		0.12	0.12		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1648		169	940		211	408		272	286	243
v/s Ratio Prot	c0.31	0.36		0.06	c0.23		0.07	c0.08		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.73		0.64	0.86		0.58	0.67		0.24	0.79	0.13
Uniform Delay, d1	37.2	22.6		48.0	38.4		45.8	46.4		40.9	44.8	40.2
Progression Factor	1.00	1.00		0.90	1.31		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	2.9		6.1	7.8		3.1	3.9		0.4	13.8	0.2
Delay (s)	68.0	25.5		49.1	58.0		49.0	50.3		41.3	58.6	40.5
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.4			56.9			49.9			48.8	
Approach LOS		D			E			D			D	

Intersection Summary					
HCM Average Control Delay	45.9	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	81.0%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3438		1770	3488		1770	3450	
Flt Permitted	0.21	1.00			0.71		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	384	3453			2437		1770	3488		1770	3450	
Volume (vph)	122	709	137	45	551	123	194	647	69	118	757	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	47	580	129	204	681	73	124	797	162
RTOR Reduction (vph)	0	17	0	0	18	0	0	7	0	0	13	0
Lane Group Flow (vph)	128	873	0	0	738	0	204	747	0	124	946	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	37.9	37.9			37.9		15.2	43.1		16.0	43.9	
Effective Green, g (s)	37.9	37.9			37.9		15.2	44.1		16.0	44.9	
Actuated g/C Ratio	0.34	0.34			0.34		0.14	0.40		0.15	0.41	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	132	1190			840		245	1398		257	1408	
v/s Ratio Prot		0.25					c0.12	0.21		0.07	c0.27	
v/s Ratio Perm	c0.33				0.30							
v/c Ratio	0.97	0.73			0.88		0.83	0.53		0.48	0.67	
Uniform Delay, d1	35.5	31.6			33.9		46.2	25.1		43.2	26.5	
Progression Factor	0.47	0.52			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	56.3	1.7			10.3		20.8	1.5		1.4	2.6	
Delay (s)	73.0	18.1			44.2		67.0	26.6		44.6	29.1	
Level of Service	E	B			D		E	C		D	C	
Approach Delay (s)		25.0			44.2			35.2			30.9	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	33.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	79	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	83	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	308	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	308	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	92	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	572	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	85	1
Volume Left	0	81	2	0
Volume Right	2	1	83	0
cSH	1545	1616	1065	640
Volume to Capacity	0.00	0.05	0.08	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.6
Approach LOS			A	B

Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	27.3%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 2 AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	44	61	5	81	47	112	11	154	56	119	152	90	228	8	25	181	59	10

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	110	240	221	361	236	206	69
Delay	31.2	0.4	18.6	19.6	0.3	38.3	31.3
LOS	C	A	B	B	A	D	C

HCM Average Control Delay	**25.5**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

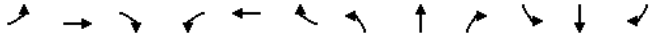
Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.89			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1856	1583	1770	1759	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1665			1816	1583	1770	1759	
Volume (vph)	44	61	5	81	47	112	11	154	56	119	152	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	64	5	85	49	118	12	162	59	125	160	95
RTOR Reduction (vph)	0	3	0	0	77	0	0	0	41	0	15	0
Lane Group Flow (vph)	46	66	0	85	90	0	0	174	18	125	240	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	5.9	5.9		19.2	19.2			20.9	20.9	7.5	32.4	
Effective Green, g (s)	5.9	5.9		19.2	19.2			20.9	20.9	7.5	32.4	
Actuated g/C Ratio	0.08	0.08		0.28	0.28			0.30	0.30	0.11	0.47	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	150	156		489	460			546	476	191	820	
v/s Ratio Prot	0.03	c0.04		0.05	c0.05					c0.07	c0.14	
v/s Ratio Perm								0.10	0.01			
v/c Ratio	0.31	0.42		0.17	0.19			0.32	0.04	0.65	0.29	
Uniform Delay, d1	29.9	30.2		19.1	19.2			18.8	17.2	29.8	11.5	
Progression Factor	1.00	1.00		0.05	0.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	1.4		0.1	0.1			0.2	0.0	6.0	0.1	
Delay (s)	30.7	31.5		1.0	0.1			19.0	17.2	35.8	11.6	
Level of Service	C	C		A	A			B	B	D	B	
Approach Delay (s)		31.2			0.4			18.6			19.6	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	15.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

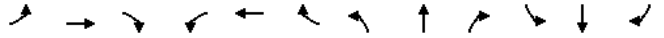
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1751	
Flt Permitted	1.00		0.42	1.00	0.96	
Satd. Flow (perm)	1855		784	1863	1751	
Volume (vph)	228	8	25	181	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	240	8	26	191	62	11
RTOR Reduction (vph)	1	0	0	0	6	0
Lane Group Flow (vph)	247	0	26	191	67	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	55.8		9.5	9.5	5.7	
Effective Green, g (s)	55.8		9.5	9.5	5.7	
Actuated g/C Ratio	0.80		0.14	0.14	0.08	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1489		107	255	144	
v/s Ratio Prot	c0.13			c0.10	c0.04	
v/s Ratio Perm			0.03			
v/c Ratio	0.17		0.24	0.75	0.47	
Uniform Delay, d1	1.6		26.8	28.9	30.5	
Progression Factor	0.16		1.00	1.00	1.00	
Incremental Delay, d2	0.0		0.9	10.8	0.9	
Delay (s)	0.3		27.7	39.7	31.3	
Level of Service	A		C	D	C	
Approach Delay (s)	0.3			38.3	31.3	
Approach LOS	A			D	C	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	29.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1720			1829		1770	1850		1770	1821	
Flt Permitted		0.92			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1597			1505		1770	1850		1770	1821	
Volume (vph)	60	76	132	37	86	4	36	293	14	23	443	77
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	80	139	39	91	4	38	308	15	24	466	81
RTOR Reduction (vph)	0	70	0	0	2	0	0	3	0	0	10	0
Lane Group Flow (vph)	0	212	0	0	132	0	38	320	0	24	537	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		319			301		85	1003		32	932	
v/s Ratio Prot							c0.02	0.17		0.01	c0.29	
v/s Ratio Perm		c0.13			0.09							
v/c Ratio		0.67			0.44		0.45	0.32		0.75	0.58	
Uniform Delay, d1		18.5			17.5		23.2	6.3		24.4	8.4	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		4.7			0.7		2.7	0.8		62.8	2.6	
Delay (s)		23.1			18.3		23.0	8.2		87.2	11.0	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		23.1			18.3			9.7			14.2	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	78	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	82	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	172	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.17	0.00
Departure Headway (s)	4.3	4.6	4.0	4.3
Degree Utilization, x	0.01	0.09	0.19	0.10
Capacity (veh/h)	788	728	870	810
Control Delay (s)	7.3	8.1	8.0	7.8
Approach Delay (s)	7.3	8.1	8.0	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	53	19	17	190	240	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	20	18	200	253	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	496	261	268			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	496	261	268			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	526	778	1295			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	76	18	200	268
Volume Left	56	18	0	0
Volume Right	20	0	0	16
cSH	575	1295	1700	1700
Volume to Capacity	0.13	0.01	0.12	0.16
Queue Length 95th (ft)	11	1	0	0
Control Delay (s)	12.2	7.8	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.2	0.6		0.0
Approach LOS	B			

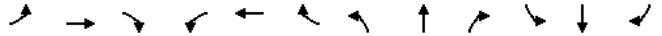
Intersection Summary				
Average Delay		1.9		
Intersection Capacity Utilization		24.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1658		1770	3539	1583		3518	
Flt Permitted		0.97	1.00	0.95	0.96		0.53	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1658		993	3539	1583		3299	
Volume (vph)	39	28	117	330	4	29	59	254	418	17	323	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	347	4	31	62	267	440	18	340	9
RTOR Reduction (vph)	0	0	116	0	8	0	0	0	144	0	2	0
Lane Group Flow (vph)	0	70	7	197	177	0	62	267	296	0	365	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	14.8	14.8		67.8	67.8	67.8		67.8	
Effective Green, g (s)		5.9	5.9	14.8	14.8		67.3	67.3	67.3		67.3	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	249	245		668	2382	1065		2220	
v/s Ratio Prot		c0.04		c0.12	0.11			0.08				
v/s Ratio Perm			0.00				0.06		c0.19		0.11	
v/c Ratio		0.65	0.08	0.79	0.72		0.09	0.11	0.28		0.16	
Uniform Delay, d1		46.1	44.5	41.1	40.6		5.7	5.8	6.6		6.0	
Progression Factor		1.00	1.00	1.43	1.45		0.04	0.05	5.10		1.00	
Incremental Delay, d2		12.1	0.3	15.3	9.9		0.2	0.1	0.4		0.2	
Delay (s)		58.2	44.7	74.0	68.8		0.4	0.3	33.9		6.2	
Level of Service		E	D	E	E		A	A	C		A	
Approach Delay (s)		49.6			71.5			19.5			6.2	
Approach LOS		D			E			B			A	

Intersection Summary				
HCM Average Control Delay	31.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

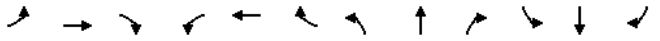
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	375	43	253	223	79	158
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	395	45	266	235	83	166
RTOR Reduction (vph)	0	29	0	0	0	131
Lane Group Flow (vph)	395	16	266	235	83	35
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	21.5	36.3	11.3	71.5	56.7	21.5
Effective Green, g (s)	21.0	35.8	10.8	71.0	56.2	21.0
Actuated g/C Ratio	0.21	0.36	0.11	0.71	0.56	0.21
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	567	371	1323	1047	332
v/s Ratio Prot	c0.22	0.01	c0.08	c0.13	0.04	0.02
v/s Ratio Perm						
v/c Ratio	1.06	0.03	0.72	0.18	0.08	0.11
Uniform Delay, d1	39.5	20.8	43.1	4.8	10.0	31.9
Progression Factor	1.10	3.27	0.83	0.35	1.00	1.00
Incremental Delay, d2	62.7	0.0	6.4	0.3	0.1	0.1
Delay (s)	106.3	68.0	42.1	2.0	10.2	32.0
Level of Service	F	E	D	A	B	C
Approach Delay (s)	102.4			23.3	24.8	
Approach LOS	F			C	C	

Intersection Summary				
HCM Average Control Delay	52.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	41.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



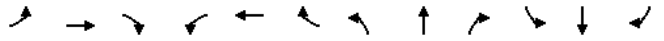
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1798	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1798	
Volume (vph)	5	21	16	724	79	0	88	86	814	76	236	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	762	83	0	93	91	857	80	248	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	411	434	0	93	91	857	80	312	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.9	2.9	2.9	25.1	25.1		4.8	16.0	64.0	4.5	15.7	
Effective Green, g (s)	2.4	2.4	2.4	25.1	25.1		4.3	16.5	64.0	4.0	16.2	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.07	0.26	1.00	0.06	0.25	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	70	59	659	667		119	912	1583	111	455	
v/s Ratio Prot	0.00	0.01		0.24	c0.26		0.05	0.03		0.05	c0.17	
v/s Ratio Perm			0.00						c0.54			
v/c Ratio	0.08	0.31	0.01	0.62	0.65		0.78	0.10	0.54	0.72	0.69	
Uniform Delay, d1	29.7	30.0	29.7	15.6	15.9		29.4	18.1	0.0	29.5	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	1.6	2.0		25.7	0.0	1.3	17.6	3.9	
Delay (s)	29.9	30.9	29.7	17.2	17.9		55.1	18.1	1.3	47.1	25.5	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.3			17.6			7.6			29.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3390	1441				3433		1583
Volume (vph)	119	216	190	0	691	979	0	0	0	832	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1031	0	0	0	876	0	136
RTOR Reduction (vph)	0	75	0	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	125	352	0	0	727	1031	0	0	0	876	0	40
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.4			39.4	100.0				29.1		29.1
Effective Green, g (s)	19.0	62.4			39.4	100.0				29.6		29.6
Actuated g/C Ratio	0.19	0.62			0.39	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2054			1336	1441				1016		469
v/s Ratio Prot	0.07	0.11			0.21					c0.26		
v/s Ratio Perm						c0.72						0.03
v/c Ratio	0.37	0.17			0.54	0.72				0.86		0.09
Uniform Delay, d1	35.3	7.9			23.4	0.0				33.3		25.4
Progression Factor	1.00	1.00			0.72	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.6				7.6		0.1
Delay (s)	35.6	8.1			17.6	1.6				40.9		25.5
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.3			8.3			0.0			38.8	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1451	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1451	1504			
Volume (vph)	74	974	0	0	1060	347	611	2	1305	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1025	0	0	1116	365	643	2	1374	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	248	0	78	32	0	0	0
Lane Group Flow (vph)	78	1025	0	0	1116	117	607	634	668	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	551	677			
v/s Ratio Prot	0.04	c0.20			c0.24		0.36	c0.44	c0.44			
v/s Ratio Perm						0.07						
v/c Ratio	0.24	0.43			0.75	0.23	0.95	1.15	0.99			
Uniform Delay, d1	35.2	17.6			30.4	25.0	30.1	31.0	27.2			
Progression Factor	0.70	0.48			0.47	0.27	1.00	1.00	1.00			
Incremental Delay, d2	1.5	0.5			2.8	0.8	23.8	87.1	30.9			
Delay (s)	26.1	8.8			17.2	7.5	53.9	118.1	58.1			
Level of Service	C	A			B	A	D	F	E			
Approach Delay (s)		10.1			14.8			78.0			0.0	
Approach LOS		B			B			E			A	

Intersection Summary			
HCM Average Control Delay	41.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1793	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1793	2628
Volume (vph)	603	1306	370	75	743	139	42	3	42	161	45	628
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	635	1375	389	79	782	146	44	3	44	169	47	661
RTOR Reduction (vph)	0	0	188	0	0	28	0	0	41	0	0	194
Lane Group Flow (vph)	635	1375	201	79	782	118	23	24	3	0	216	467
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.3	41.0	52.2	6.8	26.5	26.5	7.7	7.7	7.7		30.5	50.8
Effective Green, g (s)	19.8	40.5	51.7	6.3	27.0	27.0	7.2	7.2	7.2		30.0	49.8
Actuated g/C Ratio	0.20	0.40	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	680	1373	745	112	956	427	121	122	114		538	1309
v/s Ratio Prot	0.18	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.12	0.18
v/s Ratio Perm						0.07			0.00			
v/c Ratio	0.93	1.00	0.27	0.71	0.82	0.28	0.19	0.20	0.03		0.40	0.36
Uniform Delay, d1	39.5	29.8	13.6	45.9	34.2	28.8	43.7	43.7	43.1		27.9	15.3
Progression Factor	1.10	0.60	0.45	1.00	1.00	1.00	1.00	1.00	1.00		1.19	0.95
Incremental Delay, d2	14.7	19.0	0.1	15.2	7.7	1.6	0.6	0.6	0.1		2.1	0.7
Delay (s)	58.2	36.9	6.2	61.1	41.9	30.4	44.2	44.3	43.2		35.2	15.3
Level of Service	E	D	A	E	D	C	D	D	D		D	B
Approach Delay (s)		37.5			41.8			43.7			20.2	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay	35.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	257	0	0	0	0	481	9	0	127	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	506	9	0	134	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	514	0	0	134	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.6					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.15			0.07	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.23			0.13	
Uniform Delay, d1	26.8	26.8	21.2					7.4			10.5	
Progression Factor	0.96	0.96	0.80					1.00			0.91	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.3	
Delay (s)	26.0	25.8	17.0					7.6			9.8	
Level of Service	C	C	B					A			A	
Approach Delay (s)		19.2			0.0			7.6			9.8	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	12.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	23.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3342		1770	3482		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3342		1770	3482		1770	1832		1770	1863	1583
Volume (vph)	393	442	261	36	505	61	272	210	26	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	465	275	38	532	64	286	221	27	29	212	108
RTOR Reduction (vph)	0	71	0	0	9	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	669	0	38	587	0	286	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	26.5	43.2		5.7	22.4		20.1	20.1		16.0	16.0	16.0
Effective Green, g (s)	26.0	43.7		5.2	22.9		19.6	19.6		15.5	15.5	15.5
Actuated g/C Ratio	0.26	0.44		0.05	0.23		0.20	0.20		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	460	1460		92	797		347	359		274	289	245
v/s Ratio Prot	c0.23	0.20		0.02	c0.17		c0.16	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.90	0.46		0.41	0.74		0.82	0.68		0.11	0.73	0.07
Uniform Delay, d1	35.7	19.8		45.9	35.7		38.5	37.3		36.3	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.98	0.97		0.81	0.85	1.27
Incremental Delay, d2	20.4	1.0		3.0	6.0		14.6	5.0		0.2	9.0	0.1
Delay (s)	56.1	20.9		48.9	41.7		52.2	41.3		29.5	43.3	45.8
Level of Service	E	C		D	D		D	D		C	D	D
Approach Delay (s)		33.5			42.2			47.2			42.9	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3371		1770	3514		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3371		1770	3514		1770	3487		1770	3497	
Volume (vph)	94	260	121	100	447	22	127	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	274	127	105	471	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	59	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	342	0	105	490	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	18.1		9.3	19.5		12.6	50.4		7.2	45.0	
Effective Green, g (s)	6.9	18.6		8.3	20.0		11.6	50.9		6.2	45.5	
Actuated g/C Ratio	0.07	0.19		0.08	0.20		0.12	0.51		0.06	0.46	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	627		147	703		205	1775		110	1591	
v/s Ratio Prot	0.06	0.10		c0.06	c0.14		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.54		0.71	0.70		0.65	0.35		0.47	0.55	
Uniform Delay, d1	45.9	36.9		44.7	37.2		42.3	14.7		45.3	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.0		15.2	3.0		7.3	0.6		3.2	1.3	
Delay (s)	78.0	37.8		59.9	40.2		49.6	15.3		48.5	21.1	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		45.8			43.6			21.2			22.6	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	30.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3429		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3429		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	273	71	43	347	177	69	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	287	75	45	365	186	73	165	32	26	53	9
RTOR Reduction (vph)	0	14	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	348	0	45	365	101	73	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		5.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1783		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	0.10		c0.03	c0.10		0.04	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.19		0.53	0.19	0.12	0.29	0.73			0.35	
Uniform Delay, d1	48.1	12.8		46.5	11.7	11.2	38.4	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.0	0.2		4.5	0.2	0.3	0.5	9.6			0.7	
Delay (s)	58.1	13.1		51.0	11.9	11.5	38.9	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		16.0			14.7			47.5			40.3	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	23.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.31				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	45.7%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3438		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3438		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	61	52	527	195	131	264	39	116	183	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	64	55	555	205	138	278	41	122	193	11
RTOR Reduction (vph)	0	16	0	0	0	105	0	0	32	0	2	0
Lane Group Flow (vph)	29	320	0	55	555	100	138	278	9	122	202	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.4		7.0	48.9	48.9	12.0	23.6	23.6	8.5	20.1	
Effective Green, g (s)	4.0	46.4		6.5	48.9	48.9	11.5	23.1	23.1	8.0	19.6	
Actuated g/C Ratio	0.04	0.46		0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1595		115	1731	774	204	430	366	142	362	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		0.08	c0.15		c0.07	0.11	
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.13	0.68	0.65	0.03	0.86	0.56	
Uniform Delay, d1	46.8	15.8		45.1	15.5	13.9	42.5	34.8	29.7	45.4	36.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.83	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.3	7.8	2.9	0.0	36.0	1.5	
Delay (s)	49.6	16.1		47.4	16.0	14.3	50.3	37.7	29.8	83.1	31.6	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		18.8			17.7			40.8			50.9	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	28.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	52.4%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	372	16	90	754	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	392	17	95	794	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	816			408			1039	1456	204	1325	1453	408
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	816			408			1039	1456	204	1325	1453	408
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			83	88	90	98	97	100
cM capacity (veh/h)	808			1147			165	114	803	85	115	593

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	261	147	95	529	287	34	85	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	808	1700	1700	1147	1700	1700	152	540	117
Volume to Capacity	0.03	0.15	0.09	0.08	0.31	0.17	0.23	0.16	0.05
Queue Length 95th (ft)	2	0	0	7	0	0	21	14	4
Control Delay (s)	9.6	0.0	0.0	8.4	0.0	0.0	35.5	12.9	37.5
Lane LOS	A			A			E	B	E
Approach Delay (s)	0.6			0.9			19.4		37.5
Approach LOS							C		E

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	38.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3470		1770	3498			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3470		1770	3498			1805	1583		1545	
Volume (vph)	3	382	57	122	635	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	402	60	128	668	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	454	0	128	720	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1700		191	2078			310	272		108	
v/s Ratio Prot	0.00	c0.13		c0.07	c0.21			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.27		0.67	0.35			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.0		42.9	10.4			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.3	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.3		54.2	7.5			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.7			14.5			46.6			45.5	
Approach LOS		B			B			D			D	

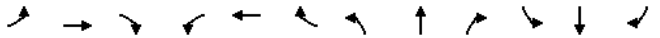
Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3366		1770	3387		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3366		1770	3387		3433	3534		1770	3508	
Volume (vph)	92	282	137	32	446	179	304	785	8	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	297	144	34	469	188	320	826	8	168	917	57
RTOR Reduction (vph)	0	66	0	0	43	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	375	0	34	614	0	320	833	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	22.0		8.5	22.0		15.0	43.2		13.3	41.5	
Effective Green, g (s)	7.5	21.0		7.5	21.0		14.0	43.2		12.3	41.5	
Actuated g/C Ratio	0.08	0.21		0.08	0.21		0.14	0.43		0.12	0.42	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	707		133	711		481	1527		218	1456	
v/s Ratio Prot	c0.05	0.11		0.02	c0.18		c0.09	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.53		0.26	0.86		0.67	0.55		0.77	0.67	
Uniform Delay, d1	45.3	35.1		43.6	38.1		40.8	21.1		42.5	23.6	
Progression Factor	1.31	1.04		1.14	1.09		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.6		0.4	9.9		2.7	1.4		14.2	2.4	
Delay (s)	74.4	37.0		49.9	51.3		43.5	22.5		56.6	26.1	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.7			51.2			28.3			30.6	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	35.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3501		1770	3496			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3501		1770	3496			3172			2914	
Volume (vph)	50	379	29	78	565	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	399	31	82	595	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	420	0	82	637	0	0	195	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	25.9		3.9	26.9			9.2			9.2	
Effective Green, g (s)	2.4	25.9		3.4	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1814		120	1881			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.18							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.62	0.23		0.68	0.34			0.35			0.71	
Uniform Delay, d1	23.4	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.71	1.31		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.9	0.3		12.1	0.5			0.4			4.7	
Delay (s)	25.5	8.9		34.8	7.0			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		10.7			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

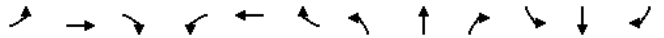
Intersection Summary				
HCM Average Control Delay	14.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	225	57	2	8	78	26	2	1	2	16	4	134
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	237	60	2	8	82	27	2	1	2	17	4	141

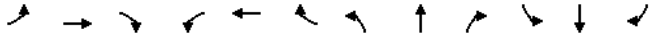
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	237	62	118	5	162
Volume Left (vph)	237	0	8	2	17
Volume Right (vph)	0	2	27	2	141
Hadj (s)	0.53	0.01	-0.09	-0.13	-0.47
Departure Headway (s)	5.5	5.0	4.7	5.0	4.5
Degree Utilization, x	0.36	0.09	0.15	0.01	0.20
Capacity (veh/h)	626	693	728	645	744
Control Delay (s)	10.5	7.3	8.5	8.1	8.6
Approach Delay (s)	9.8		8.5	8.1	8.6
Approach LOS	A		A	A	A

Intersection Summary				
Delay	9.2			
HCM Level of Service	A			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A	
Analysis Period (min)	15			



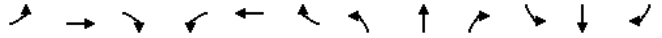
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary						
HCM Average Control Delay	14.5	HCM Level of Service	B			
HCM Volume to Capacity ratio	0.51					
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	12.0			
Intersection Capacity Utilization	49.5%	ICU Level of Service	A			
Analysis Period (min)	15					
c Critical Lane Group						



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3504			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3504			3490	
Volume (vph)	60	193	12	111	256	20	0	1010	72	0	947	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1063	76	0	997	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1135	0	0	1092	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.32			0.31	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.54			0.53	
Uniform Delay, d1		43.9			42.1			12.8			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.0			1.0	
Delay (s)		52.4			46.5			13.8			13.5	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.8			13.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3262			5076	
Volume (vph)	0	0	0	65	461	718	12	515	0	0	991	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	542	0	0	1043	13
RTOR Reduction (vph)	0	0	0	0	0	194	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	562	0	555	0	0	1055	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					36.3	36.3		54.7			54.7	
Effective Green, g (s)					36.3	36.3		55.7			55.7	
Actuated g/C Ratio					0.36	0.36		0.56			0.56	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1277	575		1817			2827	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.36		0.17				
v/c Ratio					0.43	0.98		0.31			0.37	
Uniform Delay, d1					24.1	31.5		11.8			12.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	31.5		0.4			0.4	
Delay (s)					24.2	62.9		12.3			12.8	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			46.6			12.3			12.8	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3488		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3488		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	509	54	434	590	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	536	57	457	621	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	585	0	457	621	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	48.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		661						1604		613	2462	
v/s Ratio Prot		c0.13						c0.17		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.36		0.75	0.25	
Uniform Delay, d1		26.3						12.3		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.6		4.3	0.0	
Delay (s)		28.4						12.9		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			12.9			15.7	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3426		1770	3503		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3426		1770	3503		1770	3421		1770	1863	1583
Volume (vph)	290	760	207	139	862	64	194	450	129	139	308	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	218	146	907	67	204	474	136	146	324	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	24	0	0	0	302
Lane Group Flow (vph)	305	996	0	146	969	0	204	586	0	146	324	207
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.2		12.6	30.7		20.0	20.0		21.2	21.2	21.2
Effective Green, g (s)	21.1	40.2		12.6	31.7		20.0	20.0		21.2	21.2	21.2
Actuated g/C Ratio	0.19	0.37		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1252		203	1010		322	622		341	359	305
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.12	c0.17		0.08	c0.17	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.80		0.72	0.96		0.63	0.94		0.43	0.90	0.68
Uniform Delay, d1	43.4	31.2		47.0	38.5		41.6	44.4		39.1	43.4	41.2
Progression Factor	1.00	1.00		1.18	0.97		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.3		4.5	10.1		2.8	19.4		0.9	24.9	5.9
Delay (s)	68.2	36.5		60.1	47.3		44.3	64.2		39.9	68.3	47.1
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		43.8			49.0			59.3			53.1	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	50.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3438		1770	3499		1770	3448	
Flt Permitted	0.19	1.00			0.75		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	358	3385			2572		1770	3499		1770	3448	
Volume (vph)	198	635	260	52	665	148	270	1084	89	186	976	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	55	700	156	284	1141	94	196	1027	213
RTOR Reduction (vph)	0	41	0	0	16	0	0	5	0	0	16	0
Lane Group Flow (vph)	208	901	0	0	895	0	284	1230	0	196	1224	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	156	1477			1122		274	1113		241	1034	
v/s Ratio Prot		0.27					0.16	c0.35		0.11	c0.35	
v/s Ratio Perm	c0.58				0.35							
v/c Ratio	1.33	0.61			0.80		1.04	1.10		0.81	1.18	
Uniform Delay, d1	31.0	23.8			26.8		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	176.6	0.5			4.0		64.2	60.4		18.5	92.7	
Delay (s)	210.7	26.8			30.8		110.7	97.9		64.7	131.2	
Level of Service	F	C			C		F	F		E	F	
Approach Delay (s)		60.0			30.8			100.3			122.1	
Approach LOS		E			C			F			F	

Intersection Summary				
HCM Average Control Delay	84.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	112.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	141	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	148	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			342	341	20	490	341	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	490	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	86	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	389	526	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	168	152	2
Volume Left	1	151	2	1
Volume Right	0	0	148	0
cSH	1599	1596	1038	447
Volume to Capacity	0.00	0.09	0.15	0.00
Queue Length 95th (ft)	0	8	13	0
Control Delay (s)	0.4	6.8	9.1	13.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.1	13.1
Approach LOS			A	B

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 2 PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	101	79	6	154	106	227	10	466	235	89	216	66	387	16	33	374	114	20

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	186	487	711	371	403	407	134
Delay	48.7	0.5	58.5	30.4	1.0	62.1	53.1
LOS	D	A	D	C	A	E	D

HCM Average Control Delay	**52.1**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.90			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1672			1861	1583	1770	1798	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1672			1846	1583	1770	1798	
Volume (vph)	101	79	6	154	106	227	10	466	235	89	216	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	106	83	6	162	112	239	11	491	247	94	227	69
RTOR Reduction (vph)	0	2	0	0	62	0	0	0	148	0	8	0
Lane Group Flow (vph)	106	87	0	162	289	0	0	502	99	94	288	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	11.3	11.3		41.7	41.7			30.3	30.3	9.5	43.8	
Effective Green, g (s)	11.3	11.3		41.7	41.7			30.3	30.3	9.5	43.8	
Actuated g/C Ratio	0.10	0.10		0.38	0.38			0.28	0.28	0.09	0.40	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	184	192		678	641			514	441	155	724	
v/s Ratio Prot	c0.06	0.05		0.09	c0.17					c0.05	0.16	
v/s Ratio Perm								c0.27	0.06			
v/c Ratio	0.58	0.45		0.24	0.45			0.98	0.22	0.61	0.40	
Uniform Delay, d1	46.5	45.8		22.8	25.0			38.9	30.2	47.8	23.1	
Progression Factor	1.00	1.00		0.04	0.01			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	1.2		0.0	0.1			33.4	0.2	4.5	0.3	
Delay (s)	50.0	47.1		0.9	0.4			72.3	30.4	52.4	23.4	
Level of Service	D	D		A	A			E	C	D	C	
Approach Delay (s)		48.7			0.5			58.5			30.4	
Approach LOS		D			A			E			C	

Intersection Summary				
HCM Average Control Delay	35.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1853		1770	1863	1751	
Flt Permitted	1.00		0.16	1.00	0.96	
Satd. Flow (perm)	1853		296	1863	1751	
Volume (vph)	387	16	33	374	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	407	17	35	394	120	21
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	423	0	35	394	136	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	88.3		25.2	25.2	12.5	
Effective Green, g (s)	88.3		25.2	25.2	12.5	
Actuated g/C Ratio	0.81		0.23	0.23	0.11	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1504		69	432	201	
v/s Ratio Prot	c0.23			c0.21	c0.08	
v/s Ratio Perm			0.12			
v/c Ratio	0.28		0.51	0.91	0.68	
Uniform Delay, d1	2.5		36.4	40.7	46.2	
Progression Factor	0.39		1.00	1.00	1.00	
Incremental Delay, d2	0.1		4.2	23.3	6.9	
Delay (s)	1.0		40.6	64.0	53.1	
Level of Service	A		D	E	D	
Approach Delay (s)	1.0			62.1	53.1	
Approach LOS	A			E	D	

Intersection Summary				
HCM Average Control Delay	34.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1775			1804		1770	1842		1770	1748	
Flt Permitted		0.81			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1469			1565		1770	1842		1770	1748	
Volume (vph)	167	224	68	36	112	20	163	657	44	19	354	178
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	176	236	72	38	118	21	172	692	46	20	373	187
RTOR Reduction (vph)	0	11	0	0	9	0	0	4	0	0	33	0
Lane Group Flow (vph)	0	473	0	0	168	0	172	734	0	20	527	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		427			455		222	874		29	639	
v/s Ratio Prot							c0.10	c0.40		0.01	0.30	
v/s Ratio Perm		c0.32			0.11							
v/c Ratio		1.11			0.37		0.77	0.84		0.69	0.82	
Uniform Delay, d1		19.5			15.5		23.3	12.6		26.9	15.9	
Progression Factor		1.00			1.00		0.91	1.06		0.98	1.04	
Incremental Delay, d2		75.8			0.4		13.1	8.4		40.6	9.7	
Delay (s)		95.3			15.9		34.3	21.8		66.9	26.1	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		95.3			15.9			24.1			27.5	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	145	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	153	71	5	146	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	119	241	153
Volume Left (vph)	4	107	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.13	0.04
Departure Headway (s)	4.6	5.1	4.5	4.7
Degree Utilization, x	0.10	0.17	0.30	0.20
Capacity (veh/h)	705	649	767	715
Control Delay (s)	8.1	9.1	9.4	8.9
Approach Delay (s)	8.1	9.1	9.4	8.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.0		
HCM Level of Service	A		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	55	34	18	694	296	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	36	19	731	312	94
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	1127	358	405			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1127	358	405			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	95	98			
cM capacity (veh/h)	223	686	1153			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	94	19	731	405
Volume Left	58	19	0	0
Volume Right	36	0	0	94
cSH	300	1153	1700	1700
Volume to Capacity	0.31	0.02	0.43	0.24
Queue Length 95th (ft)	32	1	0	0
Control Delay (s)	22.4	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	22.4	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1657		1770	3539	1452		3459	
Flt Permitted		0.97	1.00	0.95	0.96		0.39	1.00	1.00		0.92	
Satd. Flow (perm)		1798	1583	1681	1657		724	3539	1452		3200	
Volume (vph)	12	5	95	761	63	53	137	392	206	22	387	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	801	66	56	144	413	217	23	407	63
RTOR Reduction (vph)	0	0	94	0	4	0	0	0	134	0	10	0
Lane Group Flow (vph)	0	18	6	474	445	0	144	413	83	0	483	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	744		278	1358	557		1228	
v/s Ratio Prot		c0.01		c0.28	0.27			0.12				
v/s Ratio Perm			0.00				c0.20		0.06		0.15	
v/c Ratio		0.17	0.06	0.63	0.60		0.52	0.30	0.15		0.39	
Uniform Delay, d1		49.3	49.0	23.2	22.8		26.1	23.7	22.2		24.6	
Progression Factor		1.00	1.00	0.37	0.36		0.97	0.84	1.20		1.00	
Incremental Delay, d2		0.6	0.2	3.3	3.0		3.7	0.3	0.3		0.9	
Delay (s)		49.8	49.2	12.0	11.1		29.0	20.2	26.9		25.5	
Level of Service		D	D	B	B		C	C	C		C	
Approach Delay (s)		49.3			11.6			23.7			25.5	
Approach LOS		D			B			C			C	

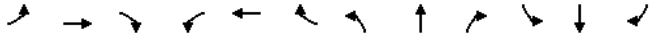
Intersection Summary					
HCM Average Control Delay	20.6	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.55				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	68.6%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	189	37	447	674	209	431
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	199	39	471	709	220	454
RTOR Reduction (vph)	0	23	0	0	0	262
Lane Group Flow (vph)	199	16	471	709	220	192
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	18.1	45.0	23.4	84.9	58.0	18.1
Effective Green, g (s)	17.6	44.5	22.9	84.4	57.5	17.6
Actuated g/C Ratio	0.16	0.40	0.21	0.77	0.52	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283	640	715	1429	974	253
v/s Ratio Prot	0.11	0.01	c0.14	c0.38	0.12	c0.12
v/s Ratio Perm						
v/c Ratio	0.70	0.02	0.66	0.50	0.23	0.76
Uniform Delay, d1	43.7	19.7	40.0	4.8	14.2	44.2
Progression Factor	0.64	0.07	1.04	0.24	1.00	1.00
Incremental Delay, d2	7.4	0.0	1.9	1.1	0.5	12.3
Delay (s)	35.2	1.3	43.4	2.2	14.7	56.4
Level of Service	D	A	D	A	B	E
Approach Delay (s)	29.6			18.7	42.8	
Approach LOS	C			B	D	

Intersection Summary				
HCM Average Control Delay	27.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Volume (vph)	172	370	60	612	14	0	11	688	1409	269	556	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	644	15	0	12	724	1483	283	585	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	322	337	0	12	724	1483	283	632	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	21.2	21.2		1.2	23.6	94.1	17.5	39.9	
Effective Green, g (s)	15.8	15.8	15.8	21.2	21.2		0.7	24.1	94.1	17.0	40.4	
Actuated g/C Ratio	0.17	0.17	0.17	0.23	0.23		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	297	313	266	379	381		13	906	1583	320	784	
v/s Ratio Prot	0.10	c0.21		0.19	0.20		0.01	0.20		0.16	0.35	
v/s Ratio Perm			0.03						c0.94			
v/c Ratio	0.61	1.24	0.17	0.85	0.88		0.92	0.80	0.94	0.88	0.81	
Uniform Delay, d1	36.3	39.1	33.5	34.9	35.3		46.7	32.7	0.0	37.6	23.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	133.4	0.1	15.9	20.8		205.3	4.8	11.9	23.3	5.9	
Delay (s)	38.7	172.5	33.7	50.8	56.0		251.9	37.6	11.9	60.9	29.3	
Level of Service	D	F	C	D	E		F	D	B	E	C	
Approach Delay (s)		120.4			53.5			21.6			39.1	
Approach LOS		F			D			C			D	

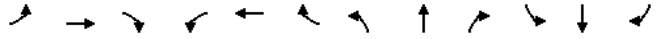
Intersection Summary				
HCM Average Control Delay	44.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	86.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2944	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2944	1399				3433		1583
Volume (vph)	140	403	575	0	522	1867	0	0	0	940	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	1965	0	0	0	989	0	347
RTOR Reduction (vph)	0	228	0	0	223	0	0	0	0	0	0	195
Lane Group Flow (vph)	147	801	0	0	1086	1205	0	0	0	989	0	152
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.4			43.4	110.0				34.1		34.1
Effective Green, g (s)	20.0	67.4			43.4	110.0				34.6		34.6
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1977			1162	1399				1080		498
v/s Ratio Prot	0.08	0.25			0.37							0.10
v/s Ratio Perm						c0.86				0.29		
v/c Ratio	0.46	0.41			0.99dr	0.86				0.92		0.30
Uniform Delay, d1	40.2	11.0			31.9	0.0				36.3		28.6
Progression Factor	1.00	1.00			0.73	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.9	0.7				11.8		0.3
Delay (s)	40.5	11.6			25.2	0.7				48.1		28.8
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.2			13.5			0.0			43.1	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1515	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1515	659			
Volume (vph)	142	1199	0	0	1819	409	571	226	1099	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1262	0	0	1915	431	601	238	1157	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	271	0	80	9	0	0	0
Lane Group Flow (vph)	149	1262	0	0	1915	160	601	736	570	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	510	335			
v/s Ratio Prot	0.08	c0.35			c0.41		0.36	0.49	c0.86			
v/s Ratio Perm						0.12						
v/c Ratio	0.44	0.85			1.14	0.33	1.06	1.44	1.70			
Uniform Delay, d1	39.3	28.8			35.0	25.3	36.5	36.5	27.0			
Progression Factor	1.55	0.37			0.97	1.72	1.00	1.00	1.00			
Incremental Delay, d2	2.6	4.0			64.4	0.8	55.9	210.6	328.4			
Delay (s)	63.7	14.7			98.3	44.2	92.4	247.1	355.4			
Level of Service	E	B			F	D	F	F	F			
Approach Delay (s)		19.9			88.3			232.0			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM Average Control Delay	121.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

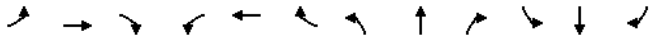
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1806	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1806	2628
Volume (vph)	499	1021	779	325	1174	247	132	16	66	280	163	814
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	525	1075	820	342	1236	260	139	17	69	295	172	857
RTOR Reduction (vph)	0	3	135	0	0	29	0	0	60	0	0	86
Lane Group Flow (vph)	525	1121	636	342	1236	231	76	80	9	0	467	771
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.15	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.26	0.29
v/s Ratio Perm						0.15			0.01			
v/c Ratio	0.99	1.11	1.13	1.25	1.16	0.49	0.36	0.37	0.04		0.95	0.69
Uniform Delay, d1	46.4	38.5	29.5	46.5	38.5	31.6	43.9	44.0	42.1		39.2	25.5
Progression Factor	1.21	1.03	1.09	1.06	1.06	1.12	1.02	1.03	2.10		0.87	0.76
Incremental Delay, d2	9.4	51.6	58.9	133.3	82.2	2.8	0.7	0.7	0.1		26.6	3.0
Delay (s)	65.6	91.3	90.9	182.4	123.1	38.2	45.6	45.8	88.7		60.5	22.4
Level of Service	E	F	F	F	F	D	D	D	F		E	C
Approach Delay (s)		85.6			122.1			58.9			35.9	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	84.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

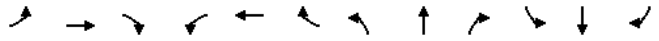
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3526			1863	
Volume (vph)	121	156	824	0	0	0	0	1099	25	0	246	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1157	26	0	259	0
RTOR Reduction (vph)	0	0	244	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	197	623	0	0	0	0	1182	0	0	259	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.22					c0.34			0.14	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.37					0.57			0.42	
Uniform Delay, d1	25.4	25.4	11.3					14.2			28.9	
Progression Factor	1.26	1.24	2.30					1.00			1.31	
Incremental Delay, d2	0.6	0.3	0.1					1.2			2.1	
Delay (s)	32.6	31.7	26.1					15.3			40.1	
Level of Service	C	C	C					B			D	
Approach Delay (s)		27.6			0.0			15.3			40.1	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	23.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3370		1770	3479		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3370		1770	3479		1770	1846		1770	1863	1539
Volume (vph)	190	812	258	20	703	56	499	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	855	272	21	740	59	525	537	28	72	256	160
RTOR Reduction (vph)	0	27	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1100	0	21	793	0	525	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	947		34	727		677	707		304	320	264
v/s Ratio Prot	0.11	c0.33		0.01	c0.23		0.30	c0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.16		0.62	1.09		0.78	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.5		53.6	43.5		29.8	30.2		39.3	43.7	38.4
Progression Factor	1.26	0.91		1.00	1.00		1.01	1.00		1.24	1.19	2.48
Incremental Delay, d2	147.5	83.7		29.0	61.1		5.4	6.0		0.4	12.3	0.2
Delay (s)	210.6	119.9		82.5	104.6		35.4	36.3		49.0	64.1	95.6
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		133.5			104.0			35.9			72.2	
Approach LOS		F			F			D			E	

Intersection Summary				
HCM Average Control Delay	90.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	89.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3421		1770	3479		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3421		1770	3479		1770	3491		1770	3477	
Volume (vph)	151	674	194	102	471	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	709	204	107	496	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	29	0	0	11	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	884	0	107	549	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.8		8.3	22.4		12.9	32.0		9.9	29.0	
Effective Green, g (s)	9.7	25.3		7.3	22.9		11.9	32.5		8.9	29.5	
Actuated g/C Ratio	0.11	0.28		0.08	0.25		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	962		144	885		234	1261		175	1140	
v/s Ratio Prot	c0.09	c0.26		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.92		0.74	0.62		0.80	1.11		0.67	1.09	
Uniform Delay, d1	39.4	31.3		40.4	29.7		37.9	28.8		39.2	30.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	13.3		18.6	1.4		17.8	61.3		9.8	55.5	
Delay (s)	64.8	44.6		59.0	31.1		55.7	90.1		49.0	85.8	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		47.6			35.5			86.0			82.6	
Approach LOS		D			D			F			F	

Intersection Summary				
HCM Average Control Delay	69.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1018: 40th St & Horton St

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3394		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3394		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	658	202	80	673	55	217	132	124	96	182	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	693	213	84	708	58	228	139	131	101	192	20
RTOR Reduction (vph)	0	23	0	0	0	34	0	38	0	0	2	0
Lane Group Flow (vph)	27	883	0	84	708	24	228	232	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	38.8		7.6	42.2	42.2	18.1	18.1			21.0	
Effective Green, g (s)	3.7	38.8		7.1	42.2	42.2	17.6	17.6			20.5	
Actuated g/C Ratio	0.04	0.39		0.07	0.42	0.42	0.18	0.18			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1317		126	1493	643	312	298			372	
v/s Ratio Prot	0.02	c0.26		c0.05	c0.20		0.13	c0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.67		0.67	0.47	0.04	0.73	0.78			0.83	
Uniform Delay, d1	47.1	25.3		45.3	20.9	17.0	39.0	39.3			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	2.7		11.4	1.1	0.1	8.0	11.7			14.6	
Delay (s)	50.2	28.0		56.7	22.0	17.1	47.0	51.0			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		28.7			25.1			49.2			52.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	34.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	76.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1019: 40th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3436		1770	3539	1495	1770	1863	1520	1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3436		1770	3539	1495	1770	1863	1520	1770	1825	
Volume (vph)	46	674	126	141	583	207	209	325	133	260	435	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	133	148	614	218	220	342	140	274	458	54
RTOR Reduction (vph)	0	15	0	0	0	134	0	0	100	0	4	0
Lane Group Flow (vph)	48	827	0	148	614	84	220	342	40	274	508	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.0		11.9	38.6	38.6	12.5	29.1	29.1	12.5	29.1	
Effective Green, g (s)	4.8	32.0		11.4	38.6	38.6	12.0	28.6	28.6	12.0	28.6	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1100		202	1366	577	212	533	435	212	522	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.12	0.18		c0.15	c0.28	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.75		0.73	0.45	0.15	1.04	0.64	0.09	1.29	0.97	
Uniform Delay, d1	46.6	30.4		42.8	22.8	20.0	44.0	31.2	26.2	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.94	
Incremental Delay, d2	6.8	4.8		12.2	1.1	0.5	72.0	2.3	0.1	158.8	29.8	
Delay (s)	53.4	35.2		55.0	23.9	20.5	116.0	33.6	26.2	201.8	63.2	
Level of Service	D	D		D	C	C	F	C	C	F	E	
Approach Delay (s)		36.2			27.8			57.9			111.5	
Approach LOS		D			C			E			F	

Intersection Summary				
HCM Average Control Delay	55.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	991	44	96	929	12	33	12	98	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1043	46	101	978	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	991			1089			1817	2305	545	1864	2322	495
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	991			1089			1817	2305	545	1864	2322	495
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	59	79	100	72	98
cM capacity (veh/h)	694			636			32	31	483	21	30	520

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	695	394	101	652	339	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	694	1700	1700	636	1700	1700	32	261	60
Volume to Capacity	0.03	0.41	0.23	0.16	0.38	0.20	1.28	0.42	0.30
Queue Length 95th (ft)	3	0	0	14	0	0	113	49	27
Control Delay (s)	10.4	0.0	0.0	11.7	0.0	0.0	443.0	28.3	88.8
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			141.4		88.8
Approach LOS							F		F

Intersection Summary				
Average Delay	10.2			
Intersection Capacity Utilization	52.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3429		1770	3489			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3429		1770	3489			1809	1555		1813	
Volume (vph)	30	941	159	158	846	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	991	167	166	891	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1146	0	166	947	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1221		221	1392			385	331		265	
v/s Ratio Prot	0.02	c0.33		0.09	c0.27			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.94		0.75	0.68			0.87	0.27		0.71	
Uniform Delay, d1	42.9	31.1		42.2	24.8			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	14.7		1.3	0.2			18.9	0.3		8.2	
Delay (s)	43.5	45.9		50.7	15.6			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		45.8			20.8			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	37.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3296		1770	3371		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3296		1770	3371		3433	3531		1770	3479	
Volume (vph)	207	677	373	47	483	180	481	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	713	393	49	508	189	506	1266	16	281	1236	107
RTOR Reduction (vph)	0	74	0	0	38	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1032	0	49	659	0	506	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	936		81	640		446	1285		258	1322	
v/s Ratio Prot	c0.12	c0.31		0.03	0.20		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.10		0.60	1.03		1.13	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.86		1.02	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.4	55.4		7.8	42.0		84.8	24.4		81.9	27.5	
Delay (s)	41.9	86.0		55.5	80.1		128.3	56.2		124.6	58.5	
Level of Service	D	F		E	F		F	E		F	E	
Approach Delay (s)		78.7			78.5			76.6			70.0	
Approach LOS		E			E			E			E	

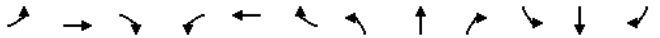
Intersection Summary				
HCM Average Control Delay	75.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3450			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3450			3117			2416	
Volume (vph)	22	821	17	45	569	97	19	292	107	81	229	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	864	18	47	599	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	21	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	880	0	47	680	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1904			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.48		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.6		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.24		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.0	9.5		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.3			8.2			20.5			28.5	
Approach LOS		B			A			C			C	

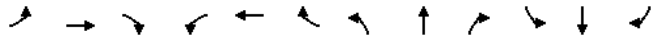
Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	347	89	11	86	103	46	19	83	50	65	59	287
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	365	94	12	91	108	48	20	87	53	68	62	302

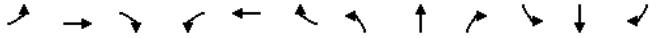
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	365	105	247	160	433
Volume Left (vph)	365	0	91	20	68
Volume Right (vph)	0	12	48	53	302
Hadj (s)	0.53	-0.04	-0.01	-0.14	-0.35
Departure Headway (s)	7.7	7.1	7.2	7.4	6.4
Degree Utilization, x	0.78	0.21	0.50	0.33	0.77
Capacity (veh/h)	455	489	449	417	433
Control Delay (s)	31.8	10.8	17.2	14.0	27.2
Approach Delay (s)	27.1		17.2	14.0	27.2
Approach LOS	D		C	B	D

Intersection Summary				
Delay	23.7			
HCM Level of Service	C			
Intersection Capacity Utilization	77.3%	ICU Level of Service	D	
Analysis Period (min)	15			



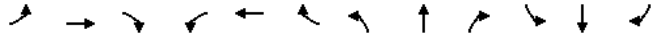
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.96	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.5			12.4			10.5	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	17.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	63.3	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	332	32	121	216	36	0	1429	92	0	1500	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1504	97	0	1579	106
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1597	0	0	1681	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.81			0.85	
Uniform Delay, d1		43.5			42.5			18.5			19.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.7			4.9	
Delay (s)		109.8			47.1			22.2			24.3	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.2			24.3	
Approach LOS		F			D			C			C	

Intersection Summary				
HCM Average Control Delay	35.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.77			1.00	
Satd. Flow (perm)					3514	1583		2710			5075	
Volume (vph)	0	0	0	64	385	732	49	990	0	0	1518	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1042	0	0	1598	22
RTOR Reduction (vph)	0	0	0	0	0	80	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	691	0	1094	0	0	1618	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1656			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.40				
v/c Ratio					0.45	1.46		0.66			0.52	
Uniform Delay, d1					25.5	31.5		11.4			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	216.3		2.1			0.6	
Delay (s)					25.6	247.8		13.5			10.6	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			163.4			13.5			10.6	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	59.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	81.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3499		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3499		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	957	78	749	870	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1007	82	788	916	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1084	0	788	916	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1323		889	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.82		0.89	0.38	
Uniform Delay, d1		40.4						30.8		39.2	7.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						5.8		10.3	0.0	
Delay (s)		60.4						36.6		49.5	7.9	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			36.6			27.2	
Approach LOS		E			A			D			C	

Intersection Summary				
HCM Average Control Delay	37.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	105	12	1	0	3	135	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	147	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	403	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	403	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	86	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1067	453	603	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	150	12
Volume Left	0	114	0	1
Volume Right	0	1	147	3
cSH	1604	1605	1050	661
Volume to Capacity	0.00	0.07	0.14	0.02
Queue Length 95th (ft)	0	6	12	1
Control Delay (s)	0.0	6.7	9.0	10.5
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.0	10.5
Approach LOS			A	B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 2 Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	70	46	13	135	67	91	13	439	228	83	333	39	83	23	39	80	60	13

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	129	293	680	455	106	119	73
Delay	45.7	10.5	27.5	23.8	0.5	36.7	43.4
LOS	D	B	C	C	A	D	D

HCM Average Control Delay	**29.5**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.91			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1702			1860	1583	1770	1834	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1702			1835	1583	1770	1834	
Volume (vph)	70	46	13	135	67	91	13	439	228	83	333	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	50	14	147	73	99	14	477	248	90	362	42
RTOR Reduction (vph)	0	9	0	0	43	0	0	0	134	0	3	0
Lane Group Flow (vph)	76	55	0	147	129	0	0	491	114	90	401	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	7.6	7.6		30.9	30.9			35.7	35.7	7.3	47.0	
Effective Green, g (s)	7.6	7.6		30.9	30.9			35.7	35.7	7.3	47.0	
Actuated g/C Ratio	0.08	0.08		0.32	0.32			0.37	0.37	0.07	0.48	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	138	140		561	539			672	580	133	884	
v/s Ratio Prot	c0.04	0.03		c0.08	0.08					c0.05	0.22	
v/s Ratio Perm								c0.27	0.07			
v/c Ratio	0.55	0.39		0.26	0.24			0.73	0.20	0.68	0.45	
Uniform Delay, d1	43.3	42.8		24.8	24.6			26.7	21.1	44.0	16.7	
Progression Factor	1.00	1.00		0.53	0.33			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	1.3		0.1	0.1			3.9	0.1	10.2	0.3	
Delay (s)	47.1	44.1		13.3	8.1			30.6	21.2	54.2	17.0	
Level of Service	D	D		B	A			C	C	D	B	
Approach Delay (s)		45.7			10.5			27.5			23.8	
Approach LOS		D			B			C			C	

Intersection Summary				
HCM Average Control Delay	24.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	97.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Alt#2 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.97		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1808		1770	1863	1746	
Flt Permitted	1.00		0.22	1.00	0.96	
Satd. Flow (perm)	1808		403	1863	1746	
Volume (vph)	83	23	39	80	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	25	42	87	65	14
RTOR Reduction (vph)	4	0	0	0	6	0
Lane Group Flow (vph)	111	0	42	87	73	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	81.1		18.5	18.5	8.4	
Effective Green, g (s)	81.1		18.5	18.5	8.4	
Actuated g/C Ratio	0.83		0.19	0.19	0.09	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1504		76	353	150	
v/s Ratio Prot	c0.06			0.05	c0.04	
v/s Ratio Perm			c0.10			
v/c Ratio	0.07		0.55	0.25	0.48	
Uniform Delay, d1	1.5		35.8	33.6	42.5	
Progression Factor	0.34		1.00	1.00	1.00	
Incremental Delay, d2	0.0		6.8	0.3	0.9	
Delay (s)	0.5		42.5	33.8	43.4	
Level of Service	A		D	C	D	
Approach Delay (s)	0.5			36.7	43.4	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	25.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	97.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	19.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	119	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	129	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	227	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.10	-0.21	0.04
Departure Headway (s)	4.3	4.7	4.1	4.5
Degree Utilization, x	0.02	0.15	0.26	0.12
Capacity (veh/h)	763	708	843	760
Control Delay (s)	7.4	8.5	8.6	8.1
Approach Delay (s)	7.4	8.5	8.6	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.4	
HCM Level of Service			A	
Intersection Capacity Utilization		33.1%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	66	23	12	657	407	83
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	25	13	714	442	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.97	0.97	0.97			
vC, conflicting volume	1228	488	533			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1234	474	520			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	96	99			
cM capacity (veh/h)	188	575	1019			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	97	13	714	533
Volume Left	72	13	0	0
Volume Right	25	0	0	90
cSH	227	1019	1700	1700
Volume to Capacity	0.43	0.01	0.42	0.31
Queue Length 95th (ft)	50	1	0	0
Control Delay (s)	32.1	8.6	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	32.1	0.2		0.0
Approach LOS	D			

Intersection Summary				
Average Delay		2.4		
Intersection Capacity Utilization		46.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1640		1770	3539	1489		3463	
Flt Permitted		0.97	1.00	0.95	0.97		0.36	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1640		674	3539	1489		3190	
Volume (vph)	31	22	136	761	78	72	151	337	325	25	381	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	827	85	78	164	366	353	27	414	60
RTOR Reduction (vph)	0	0	91	0	7	0	0	0	233	0	9	0
Lane Group Flow (vph)	0	58	57	512	471	0	164	366	120	0	492	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	36.2	36.2		37.8	37.8	37.8		37.8	
Effective Green, g (s)		24.5	24.5	36.2	36.2		37.3	37.3	37.3		37.3	
Actuated g/C Ratio		0.22	0.22	0.33	0.33		0.34	0.34	0.34		0.34	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	553	540		229	1200	505		1082	
v/s Ratio Prot		0.03		c0.30	0.29			0.10				
v/s Ratio Perm			c0.04				c0.24		0.08		0.15	
v/c Ratio		0.14	0.16	0.93	0.87		0.72	0.30	0.24		0.45	
Uniform Delay, d1		34.3	34.5	35.6	34.7		31.7	26.8	26.1		28.4	
Progression Factor		1.00	1.00	0.52	0.50		0.45	0.45	0.22		1.00	
Incremental Delay, d2		0.7	1.0	19.7	13.0		11.0	0.4	0.7		1.4	
Delay (s)		35.1	35.4	38.3	30.5		25.4	12.5	6.4		29.8	
Level of Service		D	D	D	C		C	B	A		C	
Approach Delay (s)		35.3			34.6			12.4			29.8	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM Average Control Delay	26.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	284	72	655	879	247	271
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	309	78	712	955	268	295
RTOR Reduction (vph)	0	40	0	0	0	22
Lane Group Flow (vph)	309	38	712	955	268	273
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	23.0	54.3	27.8	80.0	48.7	75.2
Effective Green, g (s)	22.5	53.8	27.3	79.5	48.2	74.7
Actuated g/C Ratio	0.20	0.49	0.25	0.72	0.44	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	362	774	852	1346	816	1075
v/s Ratio Prot	c0.17	0.02	c0.21	c0.51	0.14	0.17
v/s Ratio Perm						
v/c Ratio	0.85	0.05	0.84	0.71	0.33	0.25
Uniform Delay, d1	42.2	14.7	39.2	8.7	20.3	6.8
Progression Factor	0.56	0.58	0.55	1.98	1.00	1.00
Incremental Delay, d2	16.0	0.0	4.0	1.8	1.1	0.1
Delay (s)	39.8	8.5	25.5	18.9	21.4	7.0
Level of Service	D	A	C	B	C	A
Approach Delay (s)	33.5			21.7	13.8	
Approach LOS	C			C	B	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Volume (vph)	26	21	7	886	13	16	41	293	1081	135	431	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	963	14	17	45	318	1175	147	468	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	504	489	0	45	318	1175	147	499	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.2	26.2		3.9	18.5	72.2	8.6	23.2	
Effective Green, g (s)	2.9	2.9	2.9	26.2	26.2		3.4	19.0	72.2	8.1	23.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.36	0.36		0.05	0.26	1.00	0.11	0.33	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	75	64	610	610		83	931	1583	199	602	
v/s Ratio Prot	0.02	0.01		0.30	0.29		0.03	0.09		0.08	c0.27	
v/s Ratio Perm			0.00						c0.74			
v/c Ratio	0.39	0.31	0.01	0.83	0.80		0.54	0.34	0.74	0.74	0.83	
Uniform Delay, d1	33.8	33.7	33.3	20.9	20.7		33.6	21.5	0.0	31.0	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	8.8	7.3		3.8	0.2	3.2	11.6	9.1	
Delay (s)	35.1	34.5	33.3	29.7	27.9		37.5	21.7	3.2	42.7	31.4	
Level of Service	D	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.6			28.8			8.0			34.0	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	70.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			3003	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			3003	1399				3433		1583
Volume (vph)	113	281	1	0	359	1313	0	0	0	1093	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1427	0	0	0	1188	0	263
RTOR Reduction (vph)	0	0	0	0	135	0	0	0	0	0	0	138
Lane Group Flow (vph)	123	306	0	0	648	1034	0	0	0	1188	0	125
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	59.1			43.8	110.0				42.4		42.4
Effective Green, g (s)	11.3	59.1			43.8	110.0				42.9		42.9
Actuated g/C Ratio	0.10	0.54			0.40	1.00				0.39		0.39
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1900			1196	1399				1339		617
v/s Ratio Prot	0.07	0.09			0.22							0.08
v/s Ratio Perm						c0.74				c0.35		
v/c Ratio	0.68	0.16			0.54	0.74				0.89		0.20
Uniform Delay, d1	47.6	12.9			25.4	0.0				31.3		22.2
Progression Factor	1.00	1.00			0.98	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.1	2.2				7.4		0.1
Delay (s)	55.2	13.1			26.0	2.2				38.7		22.3
Level of Service	E	B			C	A				D		C
Approach Delay (s)		25.1			12.5			0.0			35.7	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	23.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	111	1262	0	0	1285	402	386	21	1256	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1372	0	0	1397	437	420	23	1365	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	279	0	161	2	0	0	0
Lane Group Flow (vph)	121	1372	0	0	1397	158	420	544	681	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	632	389			
v/s Ratio Prot	0.07	c0.39			c0.30		0.25	0.38	c1.03			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	1.15			0.83	0.30	0.57	0.86	1.75			
Uniform Delay, d1	48.6	36.5			32.1	25.1	23.3	28.0	22.5			
Progression Factor	1.22	0.60			1.06	2.00	1.00	1.00	1.00			
Incremental Delay, d2	11.0	73.9			3.6	1.0	3.2	14.3	348.7			
Delay (s)	70.4	95.8			37.5	51.4	26.5	42.3	371.2			
Level of Service	E	F			D	D	C	D	F			
Approach Delay (s)		93.7			40.8			162.9			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	99.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1820	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1820	2628
Volume (vph)	509	759	1251	350	668	226	227	62	101	234	270	786
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	553	825	1360	380	726	246	247	67	110	254	293	854
RTOR Reduction (vph)	0	120	85	0	0	67	0	0	98	0	0	34
Lane Group Flow (vph)	553	1331	649	380	726	179	153	161	12	0	547	820
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		496	1266
v/s Ratio Prot	0.16	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.30	0.31
v/s Ratio Perm						0.12			0.01			
v/c Ratio	0.93	1.35	1.25	1.39	0.68	0.39	0.84	0.86	0.07		1.10	0.65
Uniform Delay, d1	44.9	37.5	31.5	46.5	33.9	30.5	48.0	48.2	44.0		40.0	21.5
Progression Factor	1.24	1.03	1.07	1.00	1.00	1.00	1.26	1.26	2.47		0.81	0.41
Incremental Delay, d2	3.4	157.5	111.8	195.1	3.6	2.5	23.7	26.6	0.1		66.3	1.9
Delay (s)	59.1	195.9	145.4	241.6	37.5	33.0	84.3	87.3	108.7		98.6	10.6
Level of Service	E	F	F	F	D	C	F	F	F		F	B
Approach Delay (s)		154.7			94.0			91.8			45.0	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	110.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	111.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1500	21	0	320	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1630	23	0	348	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1652	0	0	348	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.47			0.19	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.89			0.41	
Uniform Delay, d1	21.7	21.7	26.3					23.1			19.8	
Progression Factor	1.03	1.03	1.09					0.57			0.68	
Incremental Delay, d2	0.7	0.3	5.7					5.0			1.4	
Delay (s)	22.9	22.7	34.3					18.1			14.8	
Level of Service	C	C	C					B			B	
Approach Delay (s)		31.4			0.0			18.1			14.8	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3346		1770	3508		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3346		1770	3508		1770	1833		1770	1863	1548
Volume (vph)	86	598	303	38	722	36	234	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	650	329	41	785	39	254	238	24	39	250	103
RTOR Reduction (vph)	0	84	0	0	5	0	0	6	0	0	0	82
Lane Group Flow (vph)	93	895	0	41	819	0	254	256	0	39	250	21
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.8		2.2	18.0		12.8	12.8		12.7	12.7	12.7
Effective Green, g (s)	4.0	19.8		2.2	18.0		12.8	12.8		12.7	12.7	12.7
Actuated g/C Ratio	0.06	0.31		0.03	0.28		0.20	0.20		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	111	1043		61	994		357	369		354	373	310
v/s Ratio Prot	c0.05	c0.27		0.02	0.23		c0.14	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.84	0.86		0.67	0.82		0.71	0.69		0.11	0.67	0.07
Uniform Delay, d1	29.4	20.5		30.3	21.3		23.6	23.5		20.8	23.5	20.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.6	7.1		25.4	5.6		6.6	5.6		0.1	4.7	0.1
Delay (s)	69.0	27.7		55.7	26.9		30.2	29.1		20.9	28.1	20.7
Level of Service	E	C		E	C		C	C		C	C	C
Approach Delay (s)		31.3			28.3			29.6			25.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	29.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3433		1770	3518			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3433		1770	3518			1802	1555		1774	
Volume (vph)	18	1004	164	175	1073	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1091	178	190	1166	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	10	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1259	0	190	1197	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1517		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.37		c0.11	0.34			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.83		0.97	0.63			0.76	0.15		0.22	
Uniform Delay, d1	49.5	24.6		44.3	15.9			39.8	35.7		39.7	
Progression Factor	1.04	0.52		0.81	0.67			1.00	1.00		1.00	
Incremental Delay, d2	216.6	5.1		27.1	0.5			9.9	0.2		0.4	
Delay (s)	268.1	17.8		62.8	11.2			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		21.7			18.2			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3072		1770	3359		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3072		1770	3359		3433	3511		1770	3339	
Volume (vph)	167	643	402	72	522	102	547	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	699	437	78	567	111	595	988	27	160	1017	200
RTOR Reduction (vph)	0	96	0	0	16	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1040	0	78	662	0	595	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	992		83	816		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.34		0.04	0.20		c0.17	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.05		0.94	0.81		1.08	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.9		47.5	35.7		42.0	29.4		42.9	34.5	
Progression Factor	1.17	0.43		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.9	37.4		77.0	8.6		63.1	6.1		15.0	82.9	
Delay (s)	62.4	51.7		124.5	44.3		105.1	35.5		57.8	117.4	
Level of Service	E	D		F	D		F	D		E	F	
Approach Delay (s)		53.2			52.6			61.2			110.5	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	71.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
ALTERNATIVE #2
2030

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3380		1770	3502		1770	3434		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3380		1770	3502		1770	3434		1770	1863	1583
Volume (vph)	577	881	377	118	778	59	119	266	66	68	273	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	397	124	819	62	125	280	69	72	287	214
RTOR Reduction (vph)	0	41	0	0	5	0	0	20	0	0	0	178
Lane Group Flow (vph)	607	1283	0	124	876	0	125	329	0	72	287	36
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	49.2		11.1	25.3		14.2	14.2		18.5	18.5	18.5
Effective Green, g (s)	35.0	50.2		11.1	26.3		14.2	14.2		18.5	18.5	18.5
Actuated g/C Ratio	0.32	0.46		0.10	0.24		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1543		179	837		228	443		298	313	266
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.15	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.83		0.69	1.05		0.55	0.74		0.24	0.92	0.14
Uniform Delay, d1	37.5	26.2		47.8	41.8		44.9	46.1		39.7	45.0	38.9
Progression Factor	1.00	1.00		0.89	1.19		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.4		5.1	34.3		2.1	6.3		0.4	30.1	0.2
Delay (s)	98.2	31.6		47.6	84.1		47.0	52.4		40.1	75.1	39.2
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		52.5			79.6			51.0			57.3	
Approach LOS		D			E			D			E	

Intersection Summary					
HCM Average Control Delay	59.8	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	89.6%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3421		1770	3485		1770	3460	
Flt Permitted	0.19	1.00			0.64		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	347	3451			2206		1770	3485		1770	3460	
Volume (vph)	123	746	148	75	602	162	218	785	88	119	886	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	79	634	171	229	826	93	125	933	164
RTOR Reduction (vph)	0	16	0	0	20	0	0	7	0	0	12	0
Lane Group Flow (vph)	129	925	0	0	864	0	229	912	0	125	1085	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	44.6	44.6			44.6		15.7	36.4		16.0	36.7	
Effective Green, g (s)	44.6	44.6			44.6		15.7	37.4		16.0	37.7	
Actuated g/C Ratio	0.41	0.41			0.41		0.14	0.34		0.15	0.34	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	141	1399			894		253	1185		257	1186	
v/s Ratio Prot		0.27					c0.13	0.26		0.07	c0.31	
v/s Ratio Perm	0.37				c0.39							
v/c Ratio	0.91	0.66			0.97		0.91	0.77		0.49	0.91	
Uniform Delay, d1	30.9	26.6			32.0		46.4	32.4		43.2	34.6	
Progression Factor	0.40	0.43			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.0	0.7			22.0		32.4	4.8		1.5	12.3	
Delay (s)	48.5	12.1			54.0		78.8	37.3		44.7	46.9	
Level of Service	D	B			D		E	D		D	D	
Approach Delay (s)		16.5			54.0			45.6			46.7	
Approach LOS		B			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	104.2%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	89	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	94	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	447	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	447	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	91	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	444	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	96	1
Volume Left	0	145	2	0
Volume Right	2	1	94	0
cSH	1545	1616	1058	520
Volume to Capacity	0.00	0.09	0.09	0.00
Queue Length 95th (ft)	0	7	7	0
Control Delay (s)	0.0	5.5	8.7	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.7	11.9
Approach LOS			A	B

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 2 AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	53	61	5	81	47	222	11	123	56	120	258	152	228	9	50	181	169	14

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	119	350	190	530	237	231	183
Delay	35.1	0.8	32.9	30.7	0.6	29.4	38.7
LOS	D	A	C	C	A	C	D

HCM Average Control Delay	**32.4**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1632			1855	1583	1770	1759	
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1632			1755	1583	1770	1759	
Volume (vph)	53	61	5	81	47	222	11	123	56	120	258	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	64	5	85	49	234	12	129	59	126	272	160
RTOR Reduction (vph)	0	3	0	0	120	0	0	0	50	0	19	0
Lane Group Flow (vph)	56	66	0	85	163	0	0	141	9	126	413	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	8.1	8.1		35.3	35.3			12.0	12.0	10.2	26.2	
Effective Green, g (s)	8.1	8.1		35.3	35.3			12.0	12.0	10.2	26.2	
Actuated g/C Ratio	0.10	0.10		0.43	0.43			0.15	0.15	0.12	0.32	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	176	183		766	706			258	233	221	565	
v/s Ratio Prot	0.03	c0.04		0.05	c0.10					0.07	c0.23	
v/s Ratio Perm								0.08	0.01			
v/c Ratio	0.32	0.36		0.11	0.23			0.55	0.04	0.57	0.73	
Uniform Delay, d1	34.2	34.3		13.8	14.6			32.3	29.8	33.6	24.6	
Progression Factor	1.00	1.00		0.14	0.02			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.9		0.0	0.1			1.9	0.0	2.2	4.6	
Delay (s)	34.9	35.2		2.0	0.4			34.1	29.9	35.8	29.1	
Level of Service	C	D		A	A			C	C	D	C	
Approach Delay (s)		35.1			0.8			32.9			30.7	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1854		1770	1863	1762	
Flt Permitted	1.00		0.22	1.00	0.96	
Satd. Flow (perm)	1854		401	1863	1762	
Volume (vph)	228	9	50	181	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	240	9	53	191	178	15
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	248	0	53	191	190	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	60.9		18.6	18.6	12.7	
Effective Green, g (s)	60.9		18.6	18.6	12.7	
Actuated g/C Ratio	0.75		0.23	0.23	0.16	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1384		91	425	274	
v/s Ratio Prot	c0.13			0.10	c0.11	
v/s Ratio Perm			c0.13			
v/c Ratio	0.18		0.58	0.45	0.70	
Uniform Delay, d1	3.0		28.0	27.1	32.6	
Progression Factor	0.17		1.00	1.00	1.00	
Incremental Delay, d2	0.0		7.6	0.6	6.1	
Delay (s)	0.5		35.7	27.6	38.7	
Level of Service	A		D	C	D	
Approach Delay (s)	0.5			29.4	38.7	
Approach LOS	A			C	D	

Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719			1826		1770	1851		1770	1819	
Flt Permitted		0.91			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1591			1481		1770	1851		1770	1819	
Volume (vph)	64	74	132	37	76	4	36	338	14	23	524	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	67	78	139	39	80	4	38	356	15	24	552	103
RTOR Reduction (vph)	0	69	0	0	2	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	215	0	0	121	0	38	369	0	24	644	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		318			296		85	1003		32	931	
v/s Ratio Prot							c0.02	0.20		0.01	c0.35	
v/s Ratio Perm		c0.14			0.08							
v/c Ratio		0.68			0.41		0.45	0.37		0.75	0.69	
Uniform Delay, d1		18.5			17.4		23.2	6.5		24.4	9.2	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		5.1			0.7		2.7	1.0		62.8	4.2	
Delay (s)		23.6			18.1		23.4	8.5		87.2	13.4	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		23.6			18.1			9.9			16.0	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	88	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	93	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	182	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.16	0.01
Departure Headway (s)	4.4	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.21	0.18
Capacity (veh/h)	737	695	849	804
Control Delay (s)	7.5	8.3	8.2	8.3
Approach Delay (s)	7.5	8.3	8.2	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.2			
HCM Level of Service	A			
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	53	19	17	153	328	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	20	18	161	345	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	551	354	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	551	354	363			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	488	690	1195			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	76	18	161	363
Volume Left	56	18	0	0
Volume Right	20	0	0	18
cSH	529	1195	1700	1700
Volume to Capacity	0.14	0.01	0.09	0.21
Queue Length 95th (ft)	12	1	0	0
Control Delay (s)	12.9	8.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.9	0.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		29.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1660		1770	3539	1583		3519	
Flt Permitted		0.97	1.00	0.95	0.96		0.54	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1660		1002	3539	1583		3309	
Volume (vph)	39	28	117	358	4	29	60	189	242	17	315	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	377	4	31	63	199	255	18	332	8
RTOR Reduction (vph)	0	0	116	0	7	0	0	0	84	0	2	0
Lane Group Flow (vph)	0	70	7	213	192	0	63	199	171	0	356	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.2	15.2		67.4	67.4	67.4		67.4	
Effective Green, g (s)		5.9	5.9	15.2	15.2		66.9	66.9	66.9		66.9	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	256	252		670	2368	1059		2214	
v/s Ratio Prot		c0.04		c0.13	0.12			0.06				
v/s Ratio Perm			0.00				0.06		c0.11		0.11	
v/c Ratio		0.65	0.08	0.83	0.76		0.09	0.08	0.16		0.16	
Uniform Delay, d1		46.1	44.5	41.2	40.7		5.8	5.8	6.1		6.1	
Progression Factor		1.00	1.00	1.50	1.53		0.06	0.08	0.60		1.00	
Incremental Delay, d2		12.1	0.3	19.6	12.5		0.2	0.1	0.3		0.2	
Delay (s)		58.2	44.7	81.6	74.6		0.6	0.5	4.0		6.3	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6			78.2			2.2			6.3	
Approach LOS		D			E			A			A	

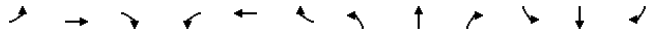
Intersection Summary				
HCM Average Control Delay	30.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	43.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	204	38	285	191	131	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	215	40	300	201	138	162
RTOR Reduction (vph)	0	27	0	0	0	135
Lane Group Flow (vph)	215	13	300	201	138	27
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	17.0	33.6	13.1	76.0	59.4	17.0
Effective Green, g (s)	16.5	33.1	12.6	75.5	58.9	16.5
Actuated g/C Ratio	0.16	0.33	0.13	0.76	0.59	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	292	524	433	1407	1097	261
v/s Ratio Prot	c0.12	0.01	c0.09	c0.11	0.07	0.02
v/s Ratio Perm						
v/c Ratio	0.74	0.03	0.69	0.14	0.13	0.10
Uniform Delay, d1	39.7	22.6	41.8	3.4	9.1	35.5
Progression Factor	1.06	3.44	0.90	0.22	1.00	1.00
Incremental Delay, d2	9.1	0.0	4.7	0.2	0.2	0.2
Delay (s)	51.3	77.6	42.2	0.9	9.4	35.6
Level of Service	D	E	D	A	A	D
Approach Delay (s)	55.5			25.7	23.5	
Approach LOS	E			C	C	

Intersection Summary				
HCM Average Control Delay	32.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	36.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

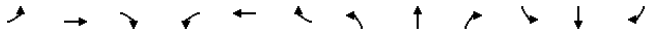
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1803	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1803	
Volume (vph)	5	21	16	723	79	0	88	105	865	76	260	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	761	83	0	93	111	911	80	274	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	411	433	0	93	111	911	80	339	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.9	2.9	2.9	25.0	25.0		4.8	16.5	64.4	4.5	16.2	
Effective Green, g (s)	2.4	2.4	2.4	25.0	25.0		4.3	17.0	64.4	4.0	16.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.07	0.26	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	653	660		118	934	1583	110	468	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	c0.19	
v/s Ratio Perm			0.00						c0.58			
v/c Ratio	0.08	0.32	0.01	0.63	0.66		0.79	0.12	0.58	0.73	0.72	
Uniform Delay, d1	29.9	30.2	29.9	15.9	16.2		29.6	18.0	0.0	29.7	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.7	2.1		26.6	0.0	1.5	18.2	5.1	
Delay (s)	30.1	31.2	29.9	17.6	18.3		56.2	18.1	1.5	47.9	26.9	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.6			17.9			7.7			30.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3288			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3288			3390	1441				3433		1583
Volume (vph)	120	236	211	0	741	1048	0	0	0	842	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1103	0	0	0	886	0	151
RTOR Reduction (vph)	0	84	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	126	386	0	0	780	1103	0	0	0	886	0	45
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.0			39.0	100.0				29.5		29.5
Effective Green, g (s)	19.0	62.0			39.0	100.0				30.0		30.0
Actuated g/C Ratio	0.19	0.62			0.39	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2039			1322	1441				1030		475
v/s Ratio Prot	0.07	0.12			0.23					0.26		
v/s Ratio Perm						c0.77						0.03
v/c Ratio	0.38	0.19			0.59	0.77				0.86		0.10
Uniform Delay, d1	35.3	8.2			24.2	0.0				33.0		25.2
Progression Factor	1.00	1.00			0.70	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.8				7.4		0.1
Delay (s)	35.6	8.4			17.7	1.8				40.4		25.3
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.1			8.4			0.0			38.2	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1454	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1454	1504			
Volume (vph)	82	995	0	0	1143	386	645	2	1330	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1047	0	0	1203	406	679	2	1400	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	276	0	76	30	0	0	0
Lane Group Flow (vph)	86	1047	0	0	1203	130	627	658	690	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	553	677			
v/s Ratio Prot	0.05	c0.21			c0.26		0.37	c0.45	c0.46			
v/s Ratio Perm						0.08						
v/c Ratio	0.27	0.44			0.81	0.26	0.98	1.19	1.02			
Uniform Delay, d1	35.3	17.7			31.2	25.2	30.6	31.0	27.5			
Progression Factor	0.71	0.48			0.47	0.26	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.5			3.8	0.9	30.8	102.7	39.4			
Delay (s)	26.8	9.0			18.6	7.5	61.4	133.7	66.9			
Level of Service	C	A			B	A	E	F	E			
Approach Delay (s)		10.4			15.8			88.8			0.0	
Approach LOS		B			B			F			A	

Intersection Summary			
HCM Average Control Delay	46.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1793	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1793	2628
Volume (vph)	390	1601	334	75	843	112	42	3	42	159	45	651
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	390	1601	334	75	843	112	42	3	42	159	45	651
RTOR Reduction (vph)	0	0	145	0	0	20	0	0	39	0	0	194
Lane Group Flow (vph)	390	1601	189	75	843	92	22	23	3	0	204	457
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.5	41.2	52.2	6.8	26.5	26.5	7.5	7.5	7.5		30.5	51.0
Effective Green, g (s)	20.0	40.7	51.7	6.3	27.0	27.0	7.0	7.0	7.0		30.0	50.0
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	687	1380	745	112	956	427	118	119	111		538	1314
v/s Ratio Prot	0.11	c0.47	c0.13	0.04	c0.24		0.01	0.01			c0.11	0.17
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.57	1.16	0.25	0.67	0.88	0.22	0.19	0.19	0.03		0.38	0.35
Uniform Delay, d1	36.1	29.6	13.4	45.8	35.0	28.3	43.8	43.8	43.3		27.6	15.1
Progression Factor	1.09	0.61	0.37	1.00	1.00	1.00	1.00	1.00	1.00		1.23	1.04
Incremental Delay, d2	1.9	77.0	0.1	11.2	11.5	1.2	0.6	0.6	0.1		1.8	0.6
Delay (s)	41.1	95.0	5.0	57.0	46.5	29.5	44.4	44.4	43.4		35.7	16.3
Level of Service	D	F	A	E	D	C	D	D	D		D	B
Approach Delay (s)		73.1			45.4			43.9			21.0	
Approach LOS		E			D			D			C	

Intersection Summary				
HCM Average Control Delay	55.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	221	0	0	0	0	485	9	0	171	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	511	9	0	180	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	519	0	0	180	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.15			0.10	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.23			0.17	
Uniform Delay, d1	26.8	26.8	21.1					7.4			10.7	
Progression Factor	0.99	0.98	0.89					1.00			1.07	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.4	
Delay (s)	26.7	26.4	18.9					7.6			11.8	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.0			0.0			7.6			11.8	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	23.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3342		1770	3484		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3342		1770	3484		1770	1839		1770	1863	1583
Volume (vph)	405	486	287	36	538	63	296	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	512	302	38	566	66	312	286	27	32	306	115
RTOR Reduction (vph)	0	76	0	0	9	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	738	0	38	623	0	312	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	22.0	38.8		5.7	22.5		21.0	21.0		19.5	19.5	19.5
Effective Green, g (s)	21.5	39.3		5.2	23.0		20.5	20.5		19.0	19.0	19.0
Actuated g/C Ratio	0.22	0.39		0.05	0.23		0.20	0.20		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	381	1313		92	801		363	377		336	354	301
v/s Ratio Prot	c0.24	0.22		0.02	c0.18		c0.18	0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.12	0.56		0.41	0.78		0.86	0.82		0.10	0.86	0.07
Uniform Delay, d1	39.2	23.6		45.9	36.1		38.4	38.0		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.02	1.02		0.75	0.80	1.33
Incremental Delay, d2	82.1	1.7		3.0	7.3		17.9	13.4		0.1	17.7	0.1
Delay (s)	121.4	25.4		48.9	43.4		56.8	52.0		25.2	49.1	44.2
Level of Service	F	C		D	D		E	D		C	D	D
Approach Delay (s)		58.4			43.7			54.4			46.2	
Approach LOS		E			D			D			D	

Intersection Summary					
HCM Average Control Delay	52.4	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	84.4%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3383		1770	3518		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3383		1770	3518		1770	3497		1770	3487	
Volume (vph)	103	306	127	105	514	22	125	706	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	322	134	111	541	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	50	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	406	0	111	561	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.1		10.8	20.9		12.5	48.9		7.2	43.6	
Effective Green, g (s)	7.0	18.6		9.8	21.4		11.5	49.4		6.2	44.1	
Actuated g/C Ratio	0.07	0.19		0.10	0.21		0.12	0.49		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	629		173	753		204	1728		110	1538	
v/s Ratio Prot	c0.06	0.12		0.06	c0.16		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.65		0.64	0.74		0.65	0.46		0.47	0.67	
Uniform Delay, d1	46.1	37.7		43.4	36.7		42.3	16.6		45.3	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.3		7.9	4.0		6.9	0.9		3.2	2.4	
Delay (s)	90.2	39.9		51.3	40.8		49.2	17.5		48.5	24.6	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.6			42.5			22.0			25.7	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	32.2	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	68.7%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3432		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3432		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	290	73	83	405	324	74	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	305	77	87	426	341	78	395	45	101	151	9
RTOR Reduction (vph)	0	19	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	363	0	87	426	129	78	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1133		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.04	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.32		0.67	0.32	0.22	0.17	0.93			0.78	
Uniform Delay, d1	48.1	25.1		45.2	22.1	21.1	29.0	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.7		11.9	0.6	0.8	0.1	25.3			11.1	
Delay (s)	60.4	25.8		57.1	22.7	21.9	29.2	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.0			25.9			56.8			50.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	37.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3459		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3459		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	64	57	770	208	130	330	40	160	251	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	67	60	811	219	137	347	42	168	264	11
RTOR Reduction (vph)	0	12	0	0	0	116	0	0	32	0	2	0
Lane Group Flow (vph)	29	429	0	60	811	103	137	347	11	168	273	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.4		7.1	47.0	47.0	12.0	25.5	25.5	8.5	22.0	
Effective Green, g (s)	4.0	44.4		6.6	47.0	47.0	11.5	25.0	25.0	8.0	21.5	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.22	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1536		117	1663	744	204	466	396	142	398	
v/s Ratio Prot	0.02	0.12		c0.03	c0.23		0.08	c0.19		c0.09	0.15	
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.14	0.67	0.74	0.03	1.18	0.69	
Uniform Delay, d1	46.8	17.6		45.1	18.2	15.0	42.4	34.6	28.3	46.0	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.85	
Incremental Delay, d2	2.8	0.5		2.8	1.0	0.4	7.7	6.0	0.0	130.2	4.1	
Delay (s)	49.6	18.1		48.0	19.2	15.4	50.1	40.6	28.3	177.0	34.7	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		20.0			20.1			42.1			88.7	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM Average Control Delay	36.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	512	16	90	1011	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	539	17	95	1064	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1089			556			1324	1879	278	1673	1875	545
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1089			556			1324	1879	278	1673	1875	545
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			91			72	78	89	95	95	100
cM capacity (veh/h)	636			1011			98	61	719	42	62	483

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	359	196	95	709	380	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	636	1700	1700	1011	1700	1700	88	385	61
Volume to Capacity	0.04	0.21	0.12	0.09	0.42	0.22	0.39	0.22	0.10
Queue Length 95th (ft)	3	0	0	8	0	0	39	21	8
Control Delay (s)	10.9	0.0	0.0	8.9	0.0	0.0	70.2	17.0	71.0
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			32.3		71.0
Approach LOS							D		F

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	46.1%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3460		1770	3506			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3460		1770	3506			1810	1583		1408	
Volume (vph)	3	492	86	122	813	54	244	178	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	518	91	128	856	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	597	0	128	909	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.2		11.0	49.3			26.5	26.5		8.8	
Effective Green, g (s)	0.4	39.2		10.5	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.39		0.10	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1356		186	1728			471	412		117	
v/s Ratio Prot	0.00	c0.17		c0.07	c0.26			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.44		0.69	0.53			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.3		43.2	17.4			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.98	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.0		5.1	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.4		47.5	11.0			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.6			15.5			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	28.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3365		1770	3389		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3365		1770	3389		3433	3535		1770	3509	
Volume (vph)	98	356	174	32	573	225	349	961	8	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	375	183	34	603	237	367	1012	8	175	1072	64
RTOR Reduction (vph)	0	60	0	0	38	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	498	0	34	802	0	367	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	29.0		9.2	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	28.0		8.2	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.28		0.08	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	942		145	956		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.53		0.23	0.84		0.76	0.82		0.78	0.95	
Uniform Delay, d1	44.9	30.4		43.0	33.8		41.4	29.5		42.4	32.3	
Progression Factor	1.49	1.43		1.14	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.4		0.3	5.8		6.4	6.1		15.3	17.2	
Delay (s)	80.6	43.8		49.2	41.4		47.8	35.6		57.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		49.6			41.7			38.8			50.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	44.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3499			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3506		1770	3499			3169			2905	
Volume (vph)	58	450	30	111	727	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	474	32	117	765	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	497	0	117	818	0	0	195	0	0	367	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		166	1882			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.23							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.43			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.78	1.24		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.9	0.4		10.6	0.7			0.4			5.2	
Delay (s)	37.2	9.7		32.5	7.7			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.6			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	1.00			0.94			0.95			0.89	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	1854			1738			1728			1644	
Flt Permitted	0.44	1.00			0.98			0.90			0.94	
Satd. Flow (perm)	819	1854			1714			1580			1567	
Volume (vph)	425	58	2	8	83	84	2	1	2	49	4	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	447	61	2	8	87	88	2	1	2	52	4	242
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	184	0
Lane Group Flow (vph)	447	62	0	0	120	0	0	3	0	0	114	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.4	20.4			6.5			9.0			9.0	
Effective Green, g (s)	20.4	20.4			6.5			9.0			9.0	
Actuated g/C Ratio	0.55	0.55			0.17			0.24			0.24	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	698	1011			298			380			377	
v/s Ratio Prot	c0.17	0.03										
v/s Ratio Perm	c0.18				0.07			0.00			c0.07	
v/c Ratio	0.64	0.06			0.40			0.01			0.30	
Uniform Delay, d1	5.9	4.0			13.7			10.8			11.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.0	0.0			0.9			0.0			0.5	
Delay (s)	7.9	4.0			14.6			10.8			12.1	
Level of Service	A	A			B			B			B	
Approach Delay (s)		7.4			14.6			10.8			12.1	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3509			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3509			3494	
Volume (vph)	77	193	12	112	289	20	0	1215	72	0	1123	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1279	76	0	1182	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1351	0	0	1287	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2045			2037	
v/s Ratio Prot					c0.13			c0.39			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.66			0.63	
Uniform Delay, d1		44.0			41.9			14.9			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.7			1.5	
Delay (s)		57.5			47.6			16.6			16.0	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.6			16.0	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3254			5077	
Volume (vph)	0	0	0	65	656	814	12	624	0	0	1169	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	657	0	0	1231	13
RTOR Reduction (vph)	0	0	0	0	0	144	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	713	0	670	0	0	1243	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1790			2792	
v/s Ratio Prot					0.22						c0.24	
v/s Ratio Perm						c0.45		0.21				
v/c Ratio					0.58	1.22		0.37			0.45	
Uniform Delay, d1					25.3	31.5		12.7			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	112.3		0.6			0.5	
Delay (s)					25.7	143.8		13.4			13.9	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			88.3			13.4			13.9	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	47.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3496		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3496		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	618	54	532	670	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	651	57	560	705	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	701	0	560	705	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1513		638	2391	
v/s Ratio Prot		c0.15						c0.20		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.46		0.88	0.29	
Uniform Delay, d1		25.6						14.1		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.0		12.6	0.0	
Delay (s)		28.2						15.1		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.1			20.4	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3429		1770	3498		1770	3425		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3429		1770	3498		1770	3425		1770	1863	1583
Volume (vph)	300	794	207	148	903	76	205	508	140	151	379	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	218	156	951	80	216	535	147	159	399	533
RTOR Reduction (vph)	0	21	0	0	6	0	0	23	0	0	0	293
Lane Group Flow (vph)	316	1033	0	156	1025	0	216	659	0	159	399	240
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	38.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1222		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.12	c0.19		0.09	c0.21	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.67	1.06		0.45	1.07	0.76
Uniform Delay, d1	43.5	32.6		47.1	39.6		41.9	45.0		38.7	44.0	41.5
Progression Factor	1.00	1.00		1.18	0.92		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.3		1.5	25.7		4.0	48.8		0.9	66.4	9.9
Delay (s)	72.8	39.9		57.2	62.1		45.7	94.0		39.6	110.4	51.4
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.5			61.4			82.4			71.3	
Approach LOS		D			E			F			E	

Intersection Summary				
HCM Average Control Delay	63.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3439		1770	3489		1770	3458	
Flt Permitted	0.16	1.00			0.61		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	302	3382			2118		1770	3489		1770	3458	
Volume (vph)	202	684	288	86	702	149	279	1242	129	191	1114	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	91	739	157	294	1307	136	201	1173	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	7	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	973	0	294	1436	0	201	1373	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	132	1476			924		274	1110		241	1037	
v/s Ratio Prot		0.29					0.17	c0.41		0.11	c0.40	
v/s Ratio Perm	c0.70				0.46							
v/c Ratio	1.61	0.66			1.05		1.07	1.29		0.83	1.32	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.09	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	297.2	0.7			44.5		75.1	139.0		21.3	152.5	
Delay (s)	330.8	27.3			75.5		121.6	176.5		67.6	191.0	
Level of Service	F	C			E		F	F		E	F	
Approach Delay (s)		79.6			75.5			167.2			175.3	
Approach LOS		E			E			F			F	

Intersection Summary				
HCM Average Control Delay	133.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.43			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	120.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	140	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	147	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	582	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	582	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	86	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	330	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	151	2
Volume Left	1	197	2	1
Volume Right	0	0	147	0
cSH	1599	1596	1031	381
Volume to Capacity	0.00	0.12	0.15	0.01
Queue Length 95th (ft)	0	11	13	0
Control Delay (s)	0.4	7.0	9.1	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	7.0	9.1	14.5
Approach LOS			A	B

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	33.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 2 PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	100	79	6	154	106	501	10	427	235	93	343	110	387	21	37	374	388	43

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	185	761	672	546	408	411	431
Delay	71.3	9.2	172.1	35.5	0.2	179.0	193.5
LOS	E	A	F	D	A	F	F

HCM Average Control Delay	**135.9**
HCM Level of Service	**F**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.88			0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1632			1774		1770	1795	
Flt Permitted	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1632			1759		1770	1795	
Volume (vph)	100	79	6	154	106	501	10	427	235	93	343	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	83	6	162	112	527	11	449	247	98	361	116
RTOR Reduction (vph)	0	2	0	0	135	0	0	15	0	0	9	0
Lane Group Flow (vph)	105	87	0	162	504	0	0	692	0	98	468	0
Turn Type	Split			Split			Perm			Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8					
Actuated Green, G (s)	9.6	9.6		50.0	50.0			39.0		10.0	53.0	
Effective Green, g (s)	9.6	9.6		50.0	50.0			39.0		10.0	53.0	
Actuated g/C Ratio	0.08	0.08		0.40	0.40			0.31		0.08	0.43	
Clearance Time (s)	4.0	4.0						4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5		2.0	2.5	
Lane Grp Cap (vph)	136	142		710	655			551		142	764	
v/s Ratio Prot	c0.06	0.05		0.09	c0.31					0.06	c0.26	
v/s Ratio Perm								c0.39				
v/c Ratio	0.77	0.61		0.23	0.77			1.26		0.69	0.61	
Uniform Delay, d1	56.4	55.7		24.6	32.3			42.8		55.8	27.8	
Progression Factor	1.00	1.00		0.25	0.29			1.00		1.00	1.00	
Incremental Delay, d2	22.5	6.6		0.0	0.5			129.3		11.0	1.2	
Delay (s)	78.9	62.3		6.0	9.9			172.1		66.8	29.1	
Level of Service	E	E		A	A			F		E	C	
Approach Delay (s)		71.3			9.2			172.1			35.5	
Approach LOS		E			A			F			D	

Intersection Summary				
HCM Average Control Delay	71.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	124.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	115.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1850		1770	1863	1759	
Flt Permitted	1.00		0.19	1.00	0.96	
Satd. Flow (perm)	1850		355	1863	1759	
Volume (vph)	387	21	37	374	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	407	22	39	394	408	45
RTOR Reduction (vph)	2	0	0	0	3	0
Lane Group Flow (vph)	427	0	39	394	450	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	91.6		21.0	21.0	25.0	
Effective Green, g (s)	91.6		21.0	21.0	25.0	
Actuated g/C Ratio	0.74		0.17	0.17	0.20	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1360		60	314	353	
v/s Ratio Prot	c0.23			c0.21	c0.26	
v/s Ratio Perm			0.11			
v/c Ratio	0.31		0.65	1.25	1.27	
Uniform Delay, d1	5.7		48.4	51.8	49.8	
Progression Factor	0.03		1.00	1.00	1.00	
Incremental Delay, d2	0.0		20.2	138.1	143.7	
Delay (s)	0.2		68.6	189.9	193.5	
Level of Service	A		E	F	F	
Approach Delay (s)	0.2			179.0	193.5	
Approach LOS	A			F	F	

Intersection Summary				
HCM Average Control Delay	125.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	124.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772			1803		1770	1843		1770	1757	
Flt Permitted		0.80			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1449			1569		1770	1843		1770	1757	
Volume (vph)	185	215	68	36	110	20	163	712	44	19	404	181
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	226	72	38	116	21	172	749	46	20	425	191
RTOR Reduction (vph)	0	11	0	0	9	0	0	3	0	0	29	0
Lane Group Flow (vph)	0	482	0	0	166	0	172	792	0	20	587	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		422			456		222	875		29	642	
v/s Ratio Prot							c0.10	c0.43		0.01	0.33	
v/s Ratio Perm		c0.33			0.11							
v/c Ratio		1.14			0.36		0.77	0.90		0.69	0.91	
Uniform Delay, d1		19.5			15.5		23.3	13.3		26.9	16.6	
Progression Factor		1.00			1.00		0.91	1.07		0.98	1.11	
Incremental Delay, d2		88.4			0.4		13.4	13.3		39.3	16.5	
Delay (s)		107.9			15.8		34.7	27.5		65.6	34.9	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		107.9			15.8			28.8			35.9	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	47.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	144	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	152	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	240	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.13	0.04
Departure Headway (s)	4.7	5.2	4.6	4.8
Degree Utilization, x	0.11	0.19	0.31	0.26
Capacity (veh/h)	675	628	745	708
Control Delay (s)	8.3	9.5	9.6	9.5
Approach Delay (s)	8.3	9.5	9.6	9.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	55	34	18	608	406	101
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	36	19	640	427	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1158	481	534			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1162	470	524			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	94	98			
cM capacity (veh/h)	207	582	1021			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	94	19	640	534
Volume Left	58	19	0	0
Volume Right	36	0	0	106
cSH	275	1021	1700	1700
Volume to Capacity	0.34	0.02	0.38	0.31
Queue Length 95th (ft)	36	1	0	0
Control Delay (s)	24.7	8.6	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	24.7	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1656		1770	3539	1452		3452	
Flt Permitted		0.97	1.00	0.95	0.97		0.38	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1656		704	3539	1452		3209	
Volume (vph)	12	5	95	728	63	53	130	337	161	22	394	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	766	66	56	137	355	169	23	415	71
RTOR Reduction (vph)	0	0	94	0	5	0	0	0	104	0	12	0
Lane Group Flow (vph)	0	18	6	456	427	0	137	355	65	0	497	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	744		270	1358	557		1231	
v/s Ratio Prot		c0.01		c0.27	0.26			0.10				
v/s Ratio Perm			0.00				c0.19		0.04		0.15	
v/c Ratio		0.17	0.06	0.60	0.57		0.51	0.26	0.12		0.40	
Uniform Delay, d1		49.3	49.0	22.9	22.5		25.9	23.2	21.9		24.7	
Progression Factor		1.00	1.00	0.30	0.29		0.95	0.87	1.34		1.00	
Incremental Delay, d2		0.6	0.2	3.0	2.7		5.2	0.4	0.3		1.0	
Delay (s)		49.8	49.2	10.0	9.1		29.7	20.5	29.7		25.7	
Level of Service		D	D	B	A		C	C	C		C	
Approach Delay (s)		49.3			9.6			24.8			25.7	
Approach LOS		D			A			C			C	

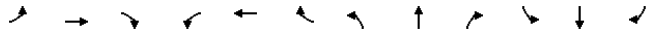
Intersection Summary					
HCM Average Control Delay	20.1	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	68.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	147	34	474	652	269	370
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	36	499	686	283	389
RTOR Reduction (vph)	0	21	0	0	0	174
Lane Group Flow (vph)	155	15	499	686	283	215
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	18.5	47.2	25.2	84.5	55.8	18.5
Effective Green, g (s)	18.0	46.7	24.7	84.0	55.3	18.0
Actuated g/C Ratio	0.16	0.42	0.22	0.76	0.50	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	290	672	771	1423	937	259
v/s Ratio Prot	0.09	0.01	c0.15	c0.37	0.15	c0.14
v/s Ratio Perm						
v/c Ratio	0.53	0.02	0.65	0.48	0.30	0.83
Uniform Delay, d1	42.2	18.4	38.7	4.9	16.0	44.5
Progression Factor	0.62	0.25	0.96	0.20	1.00	1.00
Incremental Delay, d2	1.8	0.0	1.6	1.0	0.8	19.7
Delay (s)	28.1	4.6	38.6	2.0	16.9	64.2
Level of Service	C	A	D	A	B	E
Approach Delay (s)	23.6			17.4	44.3	
Approach LOS	C			B	D	

Intersection Summary				
HCM Average Control Delay	26.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	565	14	0	11	721	1406	269	588	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	595	15	0	12	759	1480	283	619	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	298	312	0	12	759	1480	283	666	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	20.1	20.1		1.2	24.1	93.4	17.4	40.3	
Effective Green, g (s)	15.8	15.8	15.8	20.1	20.1		0.7	24.6	93.4	16.9	40.8	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	299	315	268	362	363		13	932	1583	320	799	
v/s Ratio Prot	0.10	c0.21		0.18	0.18		0.01	0.21		0.16	0.36	
v/s Ratio Perm			0.03						c0.93			
v/c Ratio	0.61	1.23	0.17	0.82	0.86		0.92	0.81	0.93	0.88	0.83	
Uniform Delay, d1	35.9	38.8	33.2	35.0	35.3		46.3	32.3	0.0	37.3	23.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	130.1	0.1	13.7	17.8		205.3	5.4	11.7	23.3	7.3	
Delay (s)	38.3	168.9	33.3	48.7	53.1		251.6	37.7	11.7	60.6	30.6	
Level of Service	D	F	C	D	D		F	D	B	E	C	
Approach Delay (s)		118.1			50.9			21.7			39.5	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	43.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	93.4	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2964	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2964	1399				3433		1583
Volume (vph)	142	429	603	0	569	1895	0	0	0	912	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	1995	0	0	0	960	0	361
RTOR Reduction (vph)	0	220	0	0	198	0	0	0	0	0	0	211
Lane Group Flow (vph)	149	867	0	0	1144	1252	0	0	0	960	0	150
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	68.1			44.1	110.0				33.4		33.4
Effective Green, g (s)	20.0	68.1			44.1	110.0				33.9		33.9
Actuated g/C Ratio	0.18	0.62			0.40	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1999			1188	1399				1058		488
v/s Ratio Prot	0.08	0.27			0.39							0.09
v/s Ratio Perm						c0.89				0.28		
v/c Ratio	0.46	0.43			0.99dr	0.89				0.91		0.31
Uniform Delay, d1	40.2	10.9			32.1	0.0				36.5		29.1
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			3.0	1.0				11.1		0.3
Delay (s)	40.6	11.6			24.5	1.0				47.6		29.3
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.1			13.2			0.0			42.6	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	21.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1513	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1513	659			
Volume (vph)	153	1187	0	0	1861	464	603	226	1148	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1187	0	0	1861	464	603	226	1148	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	83	11	0	0	0
Lane Group Flow (vph)	153	1187	0	0	1861	186	603	717	563	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	509	335			
v/s Ratio Prot	0.09	c0.33			c0.40		0.36	0.47	c0.85			
v/s Ratio Perm						0.14						
v/c Ratio	0.45	0.80			1.10	0.38	1.07	1.41	1.68			
Uniform Delay, d1	39.4	27.9			35.0	25.8	36.5	36.5	27.0			
Progression Factor	1.54	0.39			0.96	1.55	1.00	1.00	1.00			
Incremental Delay, d2	2.9	3.0			50.6	0.9	57.1	195.4	318.6			
Delay (s)	63.4	14.0			84.2	40.8	93.6	231.9	345.6			
Level of Service	E	B			F	D	F	F	F			
Approach Delay (s)		19.7			75.5			222.7			0.0	
Approach LOS		B			E			F			A	

Intersection Summary				
HCM Average Control Delay	113.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.44			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1808	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1808	2628
Volume (vph)	399	1191	745	325	1274	241	132	16	66	256	163	812
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	399	1191	745	325	1274	241	132	16	66	256	163	812
RTOR Reduction (vph)	0	0	143	0	0	26	0	0	58	0	0	92
Lane Group Flow (vph)	399	1191	602	325	1274	215	72	76	8	0	419	720
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.12	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.23	0.27
v/s Ratio Perm						0.14			0.01			
v/c Ratio	0.75	1.17	1.07	1.19	1.20	0.45	0.34	0.35	0.04		0.85	0.64
Uniform Delay, d1	44.5	38.5	29.5	46.5	38.5	31.2	43.8	43.8	42.1		37.9	24.9
Progression Factor	1.21	1.00	1.05	1.08	1.08	1.15	1.02	1.02	2.08		0.87	0.72
Incremental Delay, d2	0.9	78.1	33.8	107.9	96.9	2.3	0.7	0.7	0.1		14.7	2.4
Delay (s)	54.7	116.7	64.7	157.9	138.5	38.1	45.5	45.6	87.7		47.6	20.3
Level of Service	D	F	E	F	F	D	D	D	F		D	C
Approach Delay (s)		89.6			128.8			58.5			29.6	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	88.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	788	0	0	0	0	1116	25	0	297	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1175	26	0	313	0
RTOR Reduction (vph)	0	0	196	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	633	0	0	0	0	1200	0	0	313	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.23					c0.34			0.17	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.38					0.58			0.51	
Uniform Delay, d1	25.4	25.4	11.4					14.3			29.9	
Progression Factor	1.23	1.20	1.73					1.00			1.29	
Incremental Delay, d2	0.7	0.3	0.1					1.2			3.0	
Delay (s)	31.8	30.8	19.8					15.5			41.6	
Level of Service	C	C	B					B			D	
Approach Delay (s)		22.8			0.0			15.5			41.6	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	21.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3364		1770	3479		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3364		1770	3479		1770	1849		1770	1863	1540
Volume (vph)	206	851	285	23	744	59	535	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	896	300	24	783	62	563	633	28	73	314	158
RTOR Reduction (vph)	0	29	0	0	6	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1167	0	24	839	0	563	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	905		55	727		624	652		357	376	311
v/s Ratio Prot	0.12	c0.35		0.01	c0.24		0.32	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.29		0.44	1.15		0.90	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		33.8	35.6		36.5	42.1	35.8
Progression Factor	1.24	1.04		1.00	1.00		1.08	1.07		1.23	1.18	2.42
Incremental Delay, d2	186.7	137.1		5.5	84.8		15.2	36.6		0.2	13.0	0.1
Delay (s)	248.8	178.9		57.8	128.3		51.6	74.8		45.2	62.8	86.6
Level of Service	F	F		E	F		D	E		D	E	F
Approach Delay (s)		189.6			126.3			64.1			67.4	
Approach LOS		F			F			E			E	

Intersection Summary				
HCM Average Control Delay	121.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3483		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3431		1770	3483		1770	3494		1770	3481	
Volume (vph)	181	737	189	106	517	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	776	199	112	544	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	25	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	950	0	112	598	0	195	1585	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.4		8.4	22.8		13.1	31.3		9.9	28.1	
Effective Green, g (s)	10.0	25.9		7.4	23.3		12.1	31.8		8.9	28.6	
Actuated g/C Ratio	0.11	0.29		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	987		146	902		238	1235		175	1106	
v/s Ratio Prot	c0.11	c0.28		0.06	0.17		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.96		0.77	0.66		0.82	1.28		0.67	1.31	
Uniform Delay, d1	39.8	31.6		40.5	29.8		37.9	29.1		39.2	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	20.0		21.1	1.8		19.3	133.8		9.8	146.4	
Delay (s)	94.5	51.6		61.6	31.7		57.2	162.9		49.0	177.1	
Level of Service	F	D		E	C		E	F		D	F	
Approach Delay (s)		58.6			36.3			151.3			167.5	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	119.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	94.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3400		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3400		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	707	204	158	755	107	233	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	744	215	166	795	113	245	362	178	273	418	20
RTOR Reduction (vph)	0	27	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	932	0	166	795	29	245	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	782		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.27		c0.09	c0.22		0.14	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.19		1.34	0.86	0.07	0.51	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.2	27.8	30.9	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	98.8		196.8	10.3	0.4	0.7	73.9			212.2	
Delay (s)	50.8	137.3		243.3	45.5	28.2	31.6	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		134.5			74.3			85.8			248.7	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	128.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	113.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3460		1770	3539	1494	1770	1863	1520	1770	1834	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3460		1770	3539	1494	1770	1863	1520	1770	1834	
Volume (vph)	46	928	129	143	794	233	213	390	133	315	585	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	136	151	836	245	224	411	140	332	616	54
RTOR Reduction (vph)	0	11	0	0	0	151	0	0	99	0	3	0
Lane Group Flow (vph)	48	1102	0	151	836	94	224	411	41	332	667	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.5	29.5	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1090		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.19	c0.36	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	1.01		0.74	0.62	0.16	1.06	0.76	0.09	1.57	1.25	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.4	44.0	32.3	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	6.8	30.0		12.8	2.1	0.6	77.5	6.0	0.1	266.2	122.3	
Delay (s)	53.4	64.3		55.6	27.1	21.0	121.5	38.3	26.0	308.2	156.1	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		63.8			29.4			60.2			206.5	
Approach LOS		E			C			E			F	

Intersection Summary				
HCM Average Control Delay	87.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.14			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	97.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1300	44	96	1189	13	33	12	98	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1368	46	101	1252	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1265			1415			2279	2905	707	2301	2922	633
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1265			1415			2279	2905	707	2301	2922	633
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			79			0	0	73	0	26	98
cM capacity (veh/h)	545			478			7	12	378	0	11	423

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	912	502	101	834	431	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	545	1700	1700	478	1700	1700	7	134	0
Volume to Capacity	0.04	0.54	0.30	0.21	0.49	0.25	5.52	0.82	Err
Queue Length 95th (ft)	3	0	0	20	0	0	Err	126	Err
Control Delay (s)	11.9	0.0	0.0	14.5	0.0	0.0	Err	97.8	Err
Lane LOS	B			B			F	F	F
Approach Delay (s)	0.2			1.1			2798.2		Err
Approach LOS							F		F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3422		1770	3494			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3422		1770	3494			1814	1555		1814	
Volume (vph)	32	1193	216	158	1023	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1256	227	166	1077	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	13	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1470	0	166	1137	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1095		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.43		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.34		0.78	0.91			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	30.5			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.60			1.00	1.00		1.00	
Incremental Delay, d2	0.6	160.3		1.7	1.3			101.1	0.6		10.7	
Delay (s)	43.6	194.3		52.0	19.5			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		191.0			23.6			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary				
HCM Average Control Delay	107.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.14			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	104.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3310		1770	3391		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3310		1770	3391		3433	3532		1770	3482	
Volume (vph)	223	857	432	47	597	187	533	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	902	455	49	628	197	561	1415	16	298	1511	123
RTOR Reduction (vph)	0	62	0	0	30	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1295	0	49	795	0	561	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		5.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	957		81	644		446	1286		250	1306	
v/s Ratio Prot	c0.13	c0.39		0.03	0.23		0.16	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.35		0.60	1.23		1.26	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.61	0.91		0.97	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	159.6		7.5	117.3		133.2	61.8		118.9	117.4	
Delay (s)	30.5	192.1		52.9	156.3		176.7	93.6		161.8	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		168.3			150.5			117.0			150.7	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	144.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	113.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3460			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3460			3110			2395	
Volume (vph)	47	992	17	45	665	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1044	18	47	700	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	19	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1060	0	47	785	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1792			603			465	
v/s Ratio Prot	c0.03	c0.30		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.58		0.58	0.44			0.62			0.82	
Uniform Delay, d1	23.3	8.2		23.4	7.5			18.4			19.3	
Progression Factor	1.03	1.41		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.8			1.9			11.2	
Delay (s)	24.5	11.7		30.0	8.3			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.3			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	15.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.94			0.96			0.91	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1770	1833			1734			1768			1669	
Flt Permitted	0.28	1.00			0.87			0.90			0.88	
Satd. Flow (perm)	518	1833			1537			1606			1487	
Volume (vph)	535	95	11	86	105	140	19	83	50	167	59	515
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	563	100	12	91	111	147	20	87	53	176	62	542
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	91	0
Lane Group Flow (vph)	563	107	0	0	320	0	0	140	0	0	689	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			732			677	
v/s Ratio Prot	c0.24	0.06										
v/s Ratio Perm	c0.26				0.21			0.09			c0.46	
v/c Ratio	1.10	0.13			1.10			0.19			1.02	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	68.2	0.1			83.2			0.1			39.1	
Delay (s)	89.4	14.2			119.7			14.7			63.6	
Level of Service	F	B			F			B			E	
Approach Delay (s)		77.0			119.7			14.7			63.6	
Approach LOS		E			F			B			E	

Intersection Summary			
HCM Average Control Delay	74.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00			0.97	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1760			1801	1583		1787			1805	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.97	
Satd. Flow (perm)	1770	1760			1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	748	0	0	574	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	17.6	17.6			8.5	8.5		31.5			31.5	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary			
HCM Average Control Delay	86.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	216	36	0	1612	92	0	1811	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1697	97	0	1906	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1790	0	0	2018	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.51			c0.58	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.91			1.02	
Uniform Delay, d1		43.5			42.5			20.6			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			7.6			26.4	
Delay (s)		120.0			47.1			28.1			49.4	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			28.1			49.4	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	48.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2546			5077	
Volume (vph)	0	0	0	64	561	803	49	1102	0	0	1829	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	591	845	52	1160	0	0	1925	22
RTOR Reduction (vph)	0	0	0	0	0	61	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	784	0	1212	0	0	1946	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1556			3103	
v/s Ratio Prot					0.19						0.38	
v/s Ratio Perm						c0.50		c0.48				
v/c Ratio					0.62	1.65		0.78			0.63	
Uniform Delay, d1					27.1	31.5		13.0			11.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	302.1		3.9			1.0	
Delay (s)					27.9	333.6		16.9			12.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			199.8			16.9			12.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	73.8	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3503		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3503		3433	3539	
Volume (vph)	28	861	78	0	0	0	0	1069	78	927	1002	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1125	82	976	1055	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1202	0	976	1055	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						38.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.35		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2381	
v/s Ratio Prot		c0.29						c0.34		c0.28	0.30	
v/s Ratio Perm												
v/c Ratio		1.14						0.97		1.01	0.44	
Uniform Delay, d1		41.0						34.9		39.5	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						18.9		31.2	0.0	
Delay (s)		116.5						53.8		70.7	8.4	
Level of Service		F						D		E	A	
Approach Delay (s)		116.5			0.0			53.8			38.4	
Approach LOS		F			A			D			D	

Intersection Summary				
HCM Average Control Delay	61.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	140	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	152	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	487	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	487	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	86	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	388	531	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	155	12
Volume Left	0	153	0	1
Volume Right	0	1	152	3
cSH	1604	1605	1045	592
Volume to Capacity	0.00	0.10	0.15	0.02
Queue Length 95th (ft)	0	8	13	2
Control Delay (s)	0.0	6.9	9.0	11.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.0	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	30.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 2 Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	75	46	13	135	67	256	13	412	228	90	501	75	83	29	43	80	225	16

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	134	458	653	666	112	123	241
Delay	50.6	8.0	73.0	31.1	0.0	58.7	69.1
LOS	D	A	E	C	A	E	E

HCM Average Control Delay	**54.5**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.88			0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1773		1770	1826	
Flt Permitted	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1641			1748		1770	1826	
Volume (vph)	75	46	13	135	67	256	13	412	228	90	501	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	50	14	147	73	278	14	448	248	98	545	82
RTOR Reduction (vph)	0	9	0	0	108	0	0	15	0	0	4	0
Lane Group Flow (vph)	82	55	0	147	243	0	0	695	0	98	623	0
Turn Type	Split			Split			Perm			Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8					
Actuated Green, G (s)	10.0	10.0		34.9	34.9			44.2		7.9	56.1	
Effective Green, g (s)	10.0	10.0		34.9	34.9			44.2		7.9	56.1	
Actuated g/C Ratio	0.09	0.09		0.31	0.31			0.39		0.07	0.50	
Clearance Time (s)	4.0	4.0						4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5		2.0	2.5	
Lane Grp Cap (vph)	157	159		547	507			684		124	907	
v/s Ratio Prot	c0.05	0.03		0.08	c0.15					0.06	c0.34	
v/s Ratio Perm								c0.40				
v/c Ratio	0.52	0.35		0.27	0.48			1.02		0.79	0.69	
Uniform Delay, d1	49.2	48.4		29.4	31.7			34.4		51.7	21.7	
Progression Factor	1.00	1.00		0.46	0.17			1.00		1.00	1.00	
Incremental Delay, d2	2.4	1.0		0.1	0.2			38.6		26.5	2.0	
Delay (s)	51.6	49.4		13.5	5.7			73.0		78.2	23.7	
Level of Service	D	D		B	A			E		E	C	
Approach Delay (s)		50.6			8.0			73.0			31.1	
Approach LOS		D			A			E			C	

Intersection Summary				
HCM Average Control Delay	41.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	91.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Alt#2 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1797		1770	1863	1764	
Flt Permitted	1.00		0.34	1.00	0.96	
Satd. Flow (perm)	1797		626	1863	1764	
Volume (vph)	83	29	43	80	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	32	47	87	245	17
RTOR Reduction (vph)	8	0	0	0	2	0
Lane Group Flow (vph)	114	0	47	87	260	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	86.0		11.9	11.9	19.0	
Effective Green, g (s)	86.0		11.9	11.9	19.0	
Actuated g/C Ratio	0.76		0.11	0.11	0.17	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1368		66	196	297	
v/s Ratio Prot	c0.06			0.05	c0.15	
v/s Ratio Perm			c0.08			
v/c Ratio	0.08		0.71	0.44	0.88	
Uniform Delay, d1	3.4		48.9	47.4	45.9	
Progression Factor	0.00		1.00	1.00	1.00	
Incremental Delay, d2	0.0		28.5	1.2	23.2	
Delay (s)	0.0		77.4	48.6	69.1	
Level of Service	A		E	D	E	
Approach Delay (s)	0.0			58.7	69.1	
Approach LOS	A			E	E	

Intersection Summary				
HCM Average Control Delay	50.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	29.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	124	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	135	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	233	133
Volume Left (vph)	0	108	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.11	-0.20	0.04
Departure Headway (s)	4.4	4.9	4.2	4.6
Degree Utilization, x	0.02	0.17	0.27	0.17
Capacity (veh/h)	731	687	819	749
Control Delay (s)	7.5	8.9	8.8	8.5
Approach Delay (s)	7.5	8.9	8.8	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
HCM Level of Service			A	
Intersection Capacity Utilization			34.6%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2030 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	66	23	12	630	559	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	25	13	685	608	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1372	661	715			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1460	581	648			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	36	94	98			
cM capacity (veh/h)	113	415	758			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	97	13	685	715
Volume Left	72	13	0	0
Volume Right	25	0	0	108
cSH	139	758	1700	1700
Volume to Capacity	0.70	0.02	0.40	0.42
Queue Length 95th (ft)	98	1	0	0
Control Delay (s)	75.5	9.8	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	75.5	0.2		0.0
Approach LOS	F			

Intersection Summary					
Average Delay			4.9		
Intersection Capacity Utilization			47.2%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1642		1770	3539	1489		3456	
Flt Permitted		0.97	1.00	0.95	0.97		0.35	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1642		649	3539	1489		3198	
Volume (vph)	31	22	136	807	78	72	143	288	296	25	383	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	877	85	78	155	313	322	27	416	68
RTOR Reduction (vph)	0	0	86	0	6	0	0	0	216	0	11	0
Lane Group Flow (vph)	0	58	62	538	496	0	155	313	106	0	500	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	37.4	37.4		36.6	36.6	36.6		36.6	
Effective Green, g (s)		24.5	24.5	37.4	37.4		36.1	36.1	36.1		36.1	
Actuated g/C Ratio		0.22	0.22	0.34	0.34		0.33	0.33	0.33		0.33	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	572	558		213	1161	489		1050	
v/s Ratio Prot		0.03		c0.32	0.30			0.09				
v/s Ratio Perm			c0.04				c0.24		0.07		0.16	
v/c Ratio		0.14	0.17	0.94	0.89		0.73	0.27	0.22		0.48	
Uniform Delay, d1		34.3	34.6	35.2	34.3		32.6	27.2	26.7		29.4	
Progression Factor		1.00	1.00	0.53	0.51		0.58	0.58	0.22		1.00	
Incremental Delay, d2		0.7	1.1	21.5	14.1		16.0	0.5	0.8		1.5	
Delay (s)		35.1	35.7	40.3	31.7		35.0	16.1	6.8		31.0	
Level of Service		D	D	D	C		C	B	A		C	
Approach Delay (s)		35.5			36.1			16.0			31.0	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	28.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St
2030 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	260	67	691	855	355	281
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	73	751	929	386	305
RTOR Reduction (vph)	0	37	0	0	0	20
Lane Group Flow (vph)	283	36	751	929	386	285
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	22.4	54.9	29.0	80.6	48.1	74.0
Effective Green, g (s)	21.9	54.4	28.5	80.1	47.6	73.5
Actuated g/C Ratio	0.20	0.49	0.26	0.73	0.43	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	352	783	889	1357	806	1058
v/s Ratio Prot	c0.16	0.02	c0.22	c0.50	0.21	0.18
v/s Ratio Perm						
v/c Ratio	0.80	0.05	0.84	0.68	0.48	0.27
Uniform Delay, d1	42.0	14.4	38.7	8.1	22.3	7.4
Progression Factor	0.68	0.61	0.54	2.01	1.00	1.00
Incremental Delay, d2	11.5	0.0	4.0	1.5	2.0	0.1
Delay (s)	40.2	8.9	25.0	17.7	24.4	7.5
Level of Service	D	A	C	B	C	A
Approach Delay (s)	33.7			21.0	16.9	
Approach LOS	C			C	B	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	66.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1837	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1837	
Volume (vph)	26	21	7	792	13	16	41	328	1100	135	469	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	861	14	17	45	357	1196	147	510	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	452	439	0	45	357	1196	147	542	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	660	
v/s Ratio Prot	0.02	0.01		0.27	0.26		0.03	0.10		0.08	c0.30	
v/s Ratio Perm			0.00						c0.76			
v/c Ratio	0.38	0.30	0.01	0.79	0.77		0.53	0.34	0.76	0.75	0.82	
Uniform Delay, d1	35.2	35.1	34.7	22.5	22.2		35.1	20.7	0.0	32.6	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	7.2	5.9		2.7	0.1	3.4	13.6	7.9	
Delay (s)	36.4	35.9	34.7	29.7	28.1		37.8	20.9	3.4	46.2	29.9	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			28.9			8.3			33.4	
Approach LOS		D			C			A			C	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	70.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			3045	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			3045	1399				3433		1583
Volume (vph)	115	309	31	0	418	1364	0	0	0	1021	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1483	0	0	0	1110	0	282
RTOR Reduction (vph)	0	6	0	0	105	0	0	0	0	0	0	163
Lane Group Flow (vph)	125	364	0	0	715	1117	0	0	0	1110	0	119
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	61.4			46.0	110.0				40.1		40.1
Effective Green, g (s)	11.4	61.4			46.0	110.0				40.6		40.6
Actuated g/C Ratio	0.10	0.56			0.42	1.00				0.37		0.37
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1948			1273	1399				1267		584
v/s Ratio Prot	0.07	0.10			0.23							0.07
v/s Ratio Perm						c0.80				0.32		
v/c Ratio	0.68	0.19			0.56	0.80				0.88		0.20
Uniform Delay, d1	47.6	12.0			24.3	0.0				32.4		23.7
Progression Factor	1.00	1.00			0.87	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.6				7.0		0.1
Delay (s)	55.7	12.2			22.2	2.6				39.4		23.8
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.2			10.9			0.0			36.2	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	21.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	123	1206	0	0	1355	455	427	21	1349	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1311	0	0	1473	495	464	23	1466	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	319	0	162	2	0	0	0
Lane Group Flow (vph)	134	1311	0	0	1473	176	464	594	731	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.37			0.32		0.28	0.41	c1.11			
v/s Ratio Perm						0.12						
v/c Ratio	0.77	1.10			0.89	0.34	0.63	0.94	1.88			
Uniform Delay, d1	48.4	36.5			33.4	25.9	24.1	29.6	22.5			
Progression Factor	1.19	0.61			1.09	2.21	1.00	1.00	1.00			
Incremental Delay, d2	14.5	54.1			5.2	1.2	4.1	23.8	405.2			
Delay (s)	72.1	76.4			41.6	58.5	28.2	53.4	427.7			
Level of Service	E	E			D	E	C	D	F			
Approach Delay (s)		76.0			45.8			187.9			0.0	
Approach LOS		E			D			F			A	

Intersection Summary			
HCM Average Control Delay	105.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1820	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1820	2628
Volume (vph)	386	946	1230	350	751	227	227	62	101	242	270	826
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	420	1028	1337	380	816	247	247	67	110	263	293	898
RTOR Reduction (vph)	0	50	85	0	0	60	0	0	98	0	0	27
Lane Group Flow (vph)	420	1488	742	380	816	187	153	161	12	0	556	871
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		496	1266
v/s Ratio Prot	0.12	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.31	0.33
v/s Ratio Perm						0.12			0.01			
v/c Ratio	0.71	1.48	1.42	1.39	0.77	0.41	0.84	0.86	0.07		1.12	0.69
Uniform Delay, d1	42.9	37.5	31.5	46.5	35.0	30.7	48.0	48.2	44.0		40.0	22.1
Progression Factor	1.22	1.02	1.04	1.00	1.00	1.00	1.26	1.26	2.47		0.80	0.42
Incremental Delay, d2	0.7	214.9	191.6	195.1	5.3	2.7	23.7	26.6	0.1		72.1	2.1
Delay (s)	53.0	253.1	224.5	241.6	40.4	33.4	84.3	87.3	108.7		104.2	11.4
Level of Service	D	F	F	F	D	C	F	F	F		F	B
Approach Delay (s)		214.4			92.2			91.8			46.9	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	137.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1526	21	0	415	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1659	23	0	451	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1681	0	0	451	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.48			0.24	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.90			0.53	
Uniform Delay, d1	21.7	21.7	25.2					23.5			21.2	
Progression Factor	1.03	1.04	1.10					0.56			0.69	
Incremental Delay, d2	0.7	0.3	3.5					5.6			2.2	
Delay (s)	23.1	22.9	31.1					18.8			16.7	
Level of Service	C	C	C					B			B	
Approach Delay (s)		28.9			0.0			18.8			16.7	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	22.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3345		1770	3507		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3345		1770	3507		1770	1839		1770	1863	1549
Volume (vph)	101	678	345	40	735	38	281	288	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	737	375	43	799	41	305	313	24	40	308	107
RTOR Reduction (vph)	0	87	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1025	0	43	835	0	305	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Effective Green, g (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Actuated g/C Ratio	0.06	0.29		0.03	0.27		0.22	0.22		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	106	986		61	944		386	401		375	395	328
v/s Ratio Prot	c0.06	c0.31		0.02	0.24		0.17	c0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.04	1.04		0.70	0.88		0.79	0.83		0.11	0.78	0.07
Uniform Delay, d1	31.2	23.4		31.8	23.3		24.6	24.8		21.1	24.7	21.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	97.9	39.3		30.9	9.9		10.5	13.6		0.1	9.4	0.1
Delay (s)	129.2	62.8		62.6	33.2		35.1	38.4		21.2	34.1	21.0
Level of Service	F	E		E	C		D	D		C	C	C
Approach Delay (s)		68.7			34.6			36.8			29.9	
Approach LOS		E			C			D			C	

Intersection Summary				
HCM Average Control Delay	47.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3419		1770	3520			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3419		1770	3520			1809	1555		1785	
Volume (vph)	19	1214	226	175	1299	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1320	246	190	1412	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	2	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1553	0	190	1445	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1227		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.45		0.11	c0.41			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.27		0.97	0.89			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	24.8			37.8	31.0		39.8	
Progression Factor	0.94	0.72		0.81	0.70			1.00	1.00		1.00	
Incremental Delay, d2	237.7	125.8		12.7	0.8			59.1	0.4		0.6	
Delay (s)	284.2	148.8		48.7	18.1			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		150.6			21.7			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	82.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3084		1770	3383		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3084		1770	3383		3433	3516		1770	3354	
Volume (vph)	192	772	463	72	661	109	610	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	839	503	78	718	118	663	1205	27	170	1276	228
RTOR Reduction (vph)	0	87	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1255	0	78	823	0	663	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	996		83	805		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.41		0.04	0.24		c0.19	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.26		0.94	1.02		1.21	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.35	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	117.7		77.0	37.5		109.7	25.6		18.3	200.1	
Delay (s)	61.7	126.9		124.5	75.6		151.7	58.1		61.1	234.6	
Level of Service	E	F		F	E		F	E		E	F	
Approach Delay (s)		118.2			79.8			90.8			217.0	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	131.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	113.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #3
BASE YEAR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3389		1770	3522		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3389		1770	3522		1770	3436		1770	1863	1583
Volume (vph)	500	775	305	102	616	20	87	175	42	59	183	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	332	111	670	22	95	190	46	64	199	202
RTOR Reduction (vph)	0	32	0	0	2	0	0	21	0	0	0	173
Lane Group Flow (vph)	543	1142	0	111	690	0	95	215	0	64	199	29
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	54.9		10.7	31.0		11.5	11.5		15.9	15.9	15.9
Effective Green, g (s)	34.6	55.9		10.7	32.0		11.5	11.5		15.9	15.9	15.9
Actuated g/C Ratio	0.31	0.51		0.10	0.29		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1722		172	1025		185	359		256	269	229
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.05	c0.06		0.04	c0.11	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.66		0.65	0.67		0.51	0.60		0.25	0.74	0.13
Uniform Delay, d1	37.3	20.1		47.8	34.4		46.6	47.1		41.8	45.1	41.0
Progression Factor	1.00	1.00		0.78	1.43		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.0		6.4	2.8		1.8	2.4		0.5	10.2	0.3
Delay (s)	68.8	22.1		43.7	52.0		48.4	49.4		42.3	55.3	41.3
Level of Service	E	C		D	D		D	D		D	E	D
Approach Delay (s)		36.9			50.9			49.1			47.4	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	42.9	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3445		1770	3491		1770	3467	
Flt Permitted	0.20	1.00			0.64		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	366	3458			2224		1770	3491		1770	3467	
Volume (vph)	70	670	121	55	521	103	130	504	51	113	630	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	60	566	112	141	548	55	123	685	108
RTOR Reduction (vph)	0	16	0	0	16	0	0	6	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	722	0	141	597	0	123	784	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	35.2	35.2			35.2		13.2	45.8		16.0	48.6	
Effective Green, g (s)	35.2	35.2			35.2		13.2	46.8		16.0	49.6	
Actuated g/C Ratio	0.32	0.32			0.32		0.12	0.43		0.15	0.45	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	117	1107			712		212	1485		257	1563	
v/s Ratio Prot		0.24					c0.08	0.17		0.07	c0.23	
v/s Ratio Perm	0.21				c0.32							
v/c Ratio	0.65	0.76			1.01		0.67	0.40		0.48	0.50	
Uniform Delay, d1	32.1	33.6			37.4		46.3	21.9		43.2	21.4	
Progression Factor	0.50	0.56			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	2.5			37.2		7.6	0.8		1.4	1.2	
Delay (s)	25.2	21.2			74.6		53.9	22.7		44.6	22.6	
Level of Service	C	C			E		D	C		D	C	
Approach Delay (s)		21.6			74.6			28.6			25.5	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	36.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	86	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	93	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	326	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	326	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	91	100	100	100
cM capacity (veh/h)	1542			1616			693	633	1079	550	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	96	1
Volume Left	0	84	2	0
Volume Right	2	1	93	0
cSH	1542	1616	1066	633
Volume to Capacity	0.00	0.05	0.09	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.7
Approach LOS			A	B

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	27.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	66	46	5	78	47	36	11	83	81	105	208	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	50	5	85	51	39	12	90	88	114	226	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	72	55	85	90	190	114	324
Volume Left (vph)	72	0	85	0	12	114	0
Volume Right (vph)	0	5	0	39	88	0	98
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.23	0.53	-0.18
Departure Headway (s)	7.0	6.5	7.0	6.1	5.8	6.2	5.5
Degree Utilization, x	0.14	0.10	0.16	0.15	0.30	0.20	0.50
Capacity (veh/h)	471	510	479	541	593	554	632
Control Delay (s)	10.0	9.0	10.1	9.1	11.3	9.6	12.6
Approach Delay (s)	9.5		9.6		11.3	11.8	
Approach LOS	A		A		B	B	

Intersection Summary				
Delay	11.0			
HCM Level of Service	B			
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	232	0	0	161	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	252	0	0	175	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			252		427	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			252		427	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1313		584	786

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	252	175	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1313	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1717			1818		1770	1850		1770	1831	
Flt Permitted		0.91			0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1587			1410		1770	1850		1770	1831	
Volume (vph)	55	73	132	37	54	4	36	271	13	23	385	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	79	143	40	59	4	39	295	14	25	418	54
RTOR Reduction (vph)	0	74	0	0	3	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	208	0	0	100	0	39	306	0	25	464	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		317			282		85	1003		32	937	
v/s Ratio Prot							c0.02	0.17		0.01	c0.25	
v/s Ratio Perm		c0.13			0.07							
v/c Ratio		0.65			0.35		0.46	0.31		0.78	0.50	
Uniform Delay, d1		18.4			17.2		23.2	6.3		24.5	8.0	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		4.3			0.6		2.8	0.8		72.6	1.9	
Delay (s)		22.7			17.8		23.6	8.4		97.1	9.8	
Level of Service		C			B		C	A		F	A	
Approach Delay (s)		22.7			17.8			10.1			14.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	85	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	92	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	152	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.08	0.00
Departure Headway (s)	4.3	4.6	4.2	4.3
Degree Utilization, x	0.01	0.12	0.18	0.11
Capacity (veh/h)	789	732	836	810
Control Delay (s)	7.3	8.2	8.1	7.8
Approach Delay (s)	7.3	8.2	8.1	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
HCM Level of Service	A		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	48	24	23	144	231	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	26	25	157	251	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	490	284	316			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	490	284	316			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	97	98			
cM capacity (veh/h)	527	755	1244			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	78	25	157	316
Volume Left	52	25	0	0
Volume Right	26	0	0	65
cSH	586	1244	1700	1700
Volume to Capacity	0.13	0.02	0.09	0.19
Queue Length 95th (ft)	11	2	0	0
Control Delay (s)	12.1	8.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.1	1.1		0.0
Approach LOS	B			

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		29.9%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3408		3539	1583		3532
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3408		3539	1583		3301
Volume (vph)	290	30	337	153	17	372
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	33	366	166	18	404
RTOR Reduction (vph)	8	0	0	90	0	0
Lane Group Flow (vph)	340	0	366	76	0	422
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1568		1628	728		1518
v/s Ratio Prot	c0.10		0.10			
v/s Ratio Perm				0.05		c0.13
v/c Ratio	0.22		0.22	0.10		0.28
Uniform Delay, d1	16.2		16.3	15.3		16.7
Progression Factor	0.43		0.18	0.48		1.00
Incremental Delay, d2	0.3		0.2	0.2		0.5
Delay (s)	7.3		3.1	7.6		17.2
Level of Service	A		A	A		B
Approach Delay (s)	7.3		4.5			17.2
Approach LOS	A		A			B

Intersection Summary				
HCM Average Control Delay	9.4	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	38.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	110	15	223	179	89	145
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	242	195	97	158
RTOR Reduction (vph)	0	11	0	0	0	140
Lane Group Flow (vph)	120	5	242	195	97	18
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	12.2	29.8	14.1	80.8	63.2	12.2
Effective Green, g (s)	11.7	29.3	13.6	80.3	62.7	11.7
Actuated g/C Ratio	0.12	0.29	0.14	0.80	0.63	0.12
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	207	464	467	1496	1168	185
v/s Ratio Prot	c0.07	0.00	c0.07	c0.10	0.05	0.01
v/s Ratio Perm						
v/c Ratio	0.58	0.01	0.52	0.13	0.08	0.10
Uniform Delay, d1	41.8	25.1	40.2	2.2	7.3	39.4
Progression Factor	1.02	3.38	1.03	0.11	1.00	1.00
Incremental Delay, d2	3.9	0.0	1.0	0.2	0.1	0.2
Delay (s)	46.7	84.7	42.4	0.4	7.5	39.7
Level of Service	D	F	D	A	A	D
Approach Delay (s)	51.2			23.7	27.4	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	29.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.24			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	25.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1704		1770	3539	1583	1770	1796	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1704		1770	3539	1583	1770	1796	
Volume (vph)	5	21	16	577	79	0	88	41	706	60	225	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	627	86	0	96	45	767	65	245	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	23	1	347	366	0	96	45	767	65	311	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.7	2.7	2.7	18.7	18.7		4.5	16.3	57.0	3.8	15.6	
Effective Green, g (s)	2.2	2.2	2.2	18.7	18.7		4.0	16.8	57.0	3.3	16.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.33	0.33		0.07	0.29	1.00	0.06	0.28	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	68	72	61	551	559		124	1043	1583	102	507	
v/s Ratio Prot	0.00	0.01		0.21	c0.21		0.05	0.01		0.04	c0.17	
v/s Ratio Perm			0.00						c0.48			
v/c Ratio	0.07	0.32	0.01	0.63	0.65		0.77	0.04	0.48	0.64	0.61	
Uniform Delay, d1	26.4	26.7	26.4	16.2	16.4		26.1	14.4	0.0	26.3	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.0	2.5		23.5	0.0	1.1	9.2	1.9	
Delay (s)	26.6	27.6	26.4	18.2	18.9		49.5	14.4	1.1	35.5	19.6	
Level of Service	C	C	C	B	B		D	B	A	D	B	
Approach Delay (s)		27.0			18.5			6.8			22.3	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	14.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	827	0	0	0	675	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	899	0	0	0	734	0	139
RTOR Reduction (vph)	0	68	0	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	129	373	0	0	739	899	0	0	0	734	0	35
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	66.7			43.7	100.0				24.8		24.8
Effective Green, g (s)	19.0	66.7			43.7	100.0				25.3		25.3
Actuated g/C Ratio	0.19	0.67			0.44	1.00				0.25		0.25
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2196			1481	1441				869		400
v/s Ratio Prot	0.07	0.11			0.22					c0.21		
v/s Ratio Perm						c0.62						0.02
v/c Ratio	0.38	0.17			0.50	0.62				0.84		0.09
Uniform Delay, d1	35.4	6.3			20.3	0.0				35.5		28.5
Progression Factor	1.00	1.00			0.78	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.3				7.4		0.1
Delay (s)	35.7	6.4			16.7	1.3				42.9		28.6
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.0			8.2			0.0			40.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1472	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1472	1504			
Volume (vph)	74	818	0	0	918	300	589	2	1059	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	889	0	0	998	326	640	2	1151	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	222	0	95	48	0	0	0
Lane Group Flow (vph)	80	889	0	0	998	104	533	541	576	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	18.6	47.0			32.0	32.0	37.9	37.9	45.0			
Effective Green, g (s)	18.1	47.0			32.0	32.0	37.9	37.9	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	320	2390			1484	507	637	558	677			
v/s Ratio Prot	0.05	c0.17			c0.22		0.32	c0.37	c0.38			
v/s Ratio Perm						0.07						
v/c Ratio	0.25	0.37			0.67	0.21	0.84	0.97	0.85			
Uniform Delay, d1	35.1	17.0			29.5	24.7	28.2	30.5	24.5			
Progression Factor	0.54	0.54			0.61	0.41	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.4			2.1	0.8	9.6	30.2	10.2			
Delay (s)	20.6	9.6			20.2	11.0	37.8	60.7	34.7			
Level of Service	C	A			C	B	D	E	C			
Approach Delay (s)		10.5			17.9			44.9			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1801	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1801	2628
Volume (vph)	453	1105	319	45	595	95	42	3	42	98	45	594
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	492	1201	347	49	647	103	46	3	46	107	49	646
RTOR Reduction (vph)	0	0	168	0	0	24	0	0	43	0	0	201
Lane Group Flow (vph)	492	1201	179	49	647	79	24	25	3	0	156	445
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		540	1317
v/s Ratio Prot	0.14	c0.35	c0.12	0.03	c0.18		0.01	0.01			0.09	c0.17
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.71	0.87	0.24	0.44	0.68	0.18	0.21	0.21	0.03		0.29	0.34
Uniform Delay, d1	37.3	27.1	13.3	45.1	32.6	28.0	44.0	44.0	43.4		26.8	15.0
Progression Factor	1.15	0.55	0.36	0.75	0.69	0.62	1.00	1.00	1.00		1.18	2.69
Incremental Delay, d2	4.5	5.7	0.1	0.9	3.4	0.8	0.6	0.7	0.1		1.3	0.7
Delay (s)	47.5	20.6	4.9	34.8	25.8	18.3	44.6	44.7	43.5		33.0	41.1
Level of Service	D	C	A	C	C	B	D	D	D		C	D
Approach Delay (s)		24.4			25.4			44.1			39.5	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3526			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3526			1863	
Volume (vph)	35	26	200	6	0	20	0	364	9	0	109	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	396	10	0	118	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	404	0	0	118	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	3				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1502			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.11			0.06	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.27			0.19	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.6			23.2	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.51	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.4			0.6	
Delay (s)	17.0	17.0	14.7	47.7		47.0		19.0			35.7	
Level of Service	B	B	B	D		D		B			D	
Approach Delay (s)		15.2			47.1			19.0			35.7	
Approach LOS		B			D			B			D	

Intersection Summary				
HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.17			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3327		1770	3469		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3327		1770	3469		1770	1827		1770	1863	1583
Volume (vph)	355	350	234	34	393	60	228	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	380	254	37	427	65	248	188	28	28	153	101
RTOR Reduction (vph)	0	86	0	0	12	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	548	0	37	480	0	248	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	30.6	47.4		5.7	22.5		18.4	18.4		13.5	13.5	13.5
Effective Green, g (s)	30.1	47.9		5.2	23.0		17.9	17.9		13.0	13.0	13.0
Actuated g/C Ratio	0.30	0.48		0.05	0.23		0.18	0.18		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	533	1594		92	798		317	327		230	242	206
v/s Ratio Prot	c0.22	0.16		0.02	c0.14		c0.14	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.72	0.34		0.40	0.60		0.78	0.64		0.12	0.63	0.06
Uniform Delay, d1	31.2	16.2		45.9	34.4		39.2	38.1		38.5	41.2	38.2
Progression Factor	0.59	0.73		1.00	1.00		0.98	0.97		0.86	0.90	1.15
Incremental Delay, d2	3.0	0.4		2.9	3.3		11.9	4.3		0.2	5.2	0.1
Delay (s)	21.3	12.2		48.8	37.7		50.1	41.4		33.3	42.2	43.8
Level of Service	C	B		D	D		D	D		C	D	D
Approach Delay (s)		15.7			38.5			46.0			41.9	
Approach LOS		B			D			D			D	

Intersection Summary					
HCM Average Control Delay	30.3	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3364		1770	3509		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3364		1770	3509		1770	3479		1770	3498	
Volume (vph)	68	181	89	89	371	22	103	447	57	49	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	197	97	97	403	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	69	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	225	0	97	422	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	13.8		9.0	16.4		11.4	55.0		7.2	50.8	
Effective Green, g (s)	5.4	14.3		8.0	16.9		10.4	55.5		6.2	51.3	
Actuated g/C Ratio	0.05	0.14		0.08	0.17		0.10	0.56		0.06	0.51	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	481		142	593		184	1931		110	1794	
v/s Ratio Prot	0.04	0.07		c0.05	c0.12		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.47		0.68	0.71		0.61	0.28		0.48	0.39	
Uniform Delay, d1	46.7	39.4		44.8	39.2		42.9	11.7		45.3	14.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.7		12.7	4.0		5.6	0.4		3.3	0.6	
Delay (s)	77.6	40.1		57.5	43.3		48.5	12.1		48.6	15.5	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		47.6			45.9			18.3			17.8	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM Average Control Delay	29.1	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3410		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3410		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	171	55	43	301	61	62	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	186	60	47	327	66	67	58	33	3	25	10
RTOR Reduction (vph)	0	18	0	0	0	27	0	25	0	0	9	0
Lane Group Flow (vph)	26	228	0	47	327	39	67	66	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	56.3		5.4	58.5	58.5	10.4	10.4			13.4	
Effective Green, g (s)	2.7	56.3		4.9	58.5	58.5	9.9	9.9			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.10	0.10			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1920		87	2070	926	175	174			231	
v/s Ratio Prot	0.01	0.07		c0.03	c0.09		c0.04	0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.12		0.54	0.16	0.04	0.38	0.38			0.13	
Uniform Delay, d1	48.0	10.2		46.4	9.5	8.8	42.2	42.2			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	1.0	1.0			0.2	
Delay (s)	57.5	10.4		51.8	9.7	8.9	43.2	43.2			38.7	
Level of Service	E	B		D	A	A	D	D			D	
Approach Delay (s)		14.9			14.0			43.2			38.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3422		1770	3539	1583	1770	1863	1583	1770	1842	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3422		1770	3539	1583	1770	1863	1583	1770	1842	
Volume (vph)	28	152	43	51	372	168	123	222	39	70	123	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	47	55	404	183	134	241	42	76	134	11
RTOR Reduction (vph)	0	20	0	0	0	91	0	0	34	0	3	0
Lane Group Flow (vph)	30	192	0	55	404	92	134	241	8	76	142	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	47.7		7.0	50.1	50.1	11.9	23.1	18.9	7.7	18.9	
Effective Green, g (s)	4.1	47.7		6.5	50.1	50.1	11.4	22.6	18.4	7.2	18.4	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.11	0.23	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1632		115	1773	793	202	421	291	127	339	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.08	c0.13		0.04	0.08	
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.41	0.12		0.48	0.23	0.12	0.66	0.57	0.03	0.60	0.42	
Uniform Delay, d1	46.8	14.5		45.1	14.1	13.2	42.5	34.4	33.5	45.0	36.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.08	0.91	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.3	7.2	1.5	0.0	6.2	0.6	
Delay (s)	49.5	14.6		47.4	14.4	13.5	49.6	35.9	33.5	54.6	33.6	
Level of Service	D	B		D	B	B	D	D	C	D	C	
Approach Delay (s)		19.0			16.9			40.1			40.8	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	219	16	90	565	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	238	17	98	614	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	637			255			804	1132	128	1080	1129	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	637			255			804	1132	128	1080	1129	318
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			89	92	91	98	98	100
cM capacity (veh/h)	943			1307			249	182	899	136	182	677

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	159	97	98	409	228	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	943	1700	1700	1307	1700	1700	232	681	184
Volume to Capacity	0.03	0.09	0.06	0.07	0.24	0.13	0.15	0.13	0.04
Queue Length 95th (ft)	2	0	0	6	0	0	13	11	3
Control Delay (s)	8.9	0.0	0.0	8.0	0.0	0.0	23.3	11.1	25.3
Lane LOS	A			A			C	B	D
Approach Delay (s)	0.8			1.1			14.6		25.3
Approach LOS							B		D

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.98			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3500		1770	3486			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3500		1770	3486			850	1583		1568	
Volume (vph)	3	265	21	69	480	53	85	66	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	288	23	75	522	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	307	0	75	574	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.49		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1726		122	1945			183	340		99	
v/s Ratio Prot	0.00	c0.09		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.18		0.61	0.30			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.1		45.3	11.7			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.04	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.3	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.3		53.2	7.4			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.6			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3391		1770	3373		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3391		1770	3373		3433	3533		1770	3500	
Volume (vph)	92	210	81	29	302	137	239	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	228	88	32	328	149	260	776	9	147	736	59
RTOR Reduction (vph)	0	47	0	0	56	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	269	0	32	421	0	260	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	17.8		9.0	18.0		15.0	47.8		12.4	45.2	
Effective Green, g (s)	7.8	16.8		8.0	17.0		14.0	47.8		11.4	45.2	
Actuated g/C Ratio	0.08	0.17		0.08	0.17		0.14	0.48		0.11	0.45	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	570		142	573		481	1689		202	1582	
v/s Ratio Prot	c0.06	0.08		0.02	c0.12		0.08	c0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.23	0.74		0.54	0.46		0.73	0.50	
Uniform Delay, d1	45.1	37.6		43.1	39.4		40.0	17.5		42.8	19.4	
Progression Factor	1.28	1.26		1.17	1.16		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.6	0.4		0.3	4.1		0.7	0.9		10.5	1.1	
Delay (s)	72.4	47.7		50.8	49.7		40.7	18.4		53.3	20.5	
Level of Service	E	D		D	D		D	B		D	C	
Approach Delay (s)		53.7			49.8			24.0			25.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3489		1770	3485			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3489		1770	3485			3189			2945	
Volume (vph)	48	281	29	6	397	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	305	32	7	432	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	325	0	7	467	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2045		21	1917			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.13							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.24			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.8			18.3			19.3	
Progression Factor	0.53	1.45		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.8	7.0		27.9	6.1			18.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.8			6.5			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	114	50	2	8	67	26	2	1	2	16	4	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	124	54	2	9	73	28	2	1	2	17	4	99

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	124	57	110	5	121
Volume Left (vph)	124	0	9	2	17
Volume Right (vph)	0	2	28	2	99
Hadj (s)	0.53	0.01	-0.10	-0.13	-0.43
Departure Headway (s)	5.4	4.9	4.4	4.6	4.2
Degree Utilization, x	0.19	0.08	0.13	0.01	0.14
Capacity (veh/h)	650	713	782	722	804
Control Delay (s)	8.4	7.1	8.1	7.6	7.9
Approach Delay (s)	8.0		8.1	7.6	7.9
Approach LOS	A		A	A	A

Intersection Summary				
Delay	8.0			
HCM Level of Service	A			
Intersection Capacity Utilization	26.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.18	0.18			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	

Intersection Summary						
HCM Average Control Delay	23.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	45.6	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	36.8%	ICU Level of Service		A		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3504			3479	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3504			3479	
Volume (vph)	51	103	9	77	117	20	0	878	62	0	701	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	954	67	0	762	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1017	0	0	853	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2296	
v/s Ratio Prot					c0.07			c0.29			0.25	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.44			0.37	
Uniform Delay, d1		44.2			44.1			8.6			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.2			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.2			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3534			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3292			5073	
Volume (vph)	0	0	0	65	296	663	12	434	0	0	685	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	472	0	0	745	12
RTOR Reduction (vph)	0	0	0	0	0	244	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	477	0	485	0	0	755	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					31.9	31.9		59.1			59.1	
Effective Green, g (s)					31.9	31.9		60.1			60.1	
Actuated g/C Ratio					0.32	0.32		0.60			0.60	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1119	505		1978			3049	
v/s Ratio Prot					0.11						c0.15	
v/s Ratio Perm						c0.30		0.15				
v/c Ratio					0.35	0.94		0.25			0.25	
Uniform Delay, d1					26.1	33.2		9.3			9.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	26.2		0.3			0.2	
Delay (s)					26.2	59.4		9.6			9.5	
Level of Service					C	E		A			A	
Approach Delay (s)		0.0			47.7			9.6			9.5	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3479		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3479		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	428	54	221	497	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	465	59	240	540	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	516	0	240	540	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						38.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1943		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.27		0.48	0.20	
Uniform Delay, d1		28.4						8.0		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.3	0.0	
Delay (s)		28.7						8.3		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.3			10.2	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3444		1770	3504		1770	3422		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3444		1770	3504		1770	3422		1770	1863	1583
Volume (vph)	263	614	134	105	745	52	170	408	116	130	261	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	146	114	810	57	185	443	126	141	284	501
RTOR Reduction (vph)	0	16	0	0	4	0	0	24	0	0	0	317
Lane Group Flow (vph)	286	797	0	114	863	0	185	545	0	141	284	184
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	42.0		11.5	33.1		19.5	19.5		20.0	20.0	20.0
Effective Green, g (s)	20.4	43.0		11.5	34.1		19.5	19.5		20.0	20.0	20.0
Actuated g/C Ratio	0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1346		185	1086		314	607		322	339	288
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.10	c0.16		0.08	c0.15	
v/s Ratio Perm												0.12
v/c Ratio	0.87	0.59		0.62	0.79		0.59	0.90		0.44	0.84	0.64
Uniform Delay, d1	43.5	26.6		47.1	34.7		41.6	44.3		40.0	43.4	41.6
Progression Factor	1.00	1.00		1.33	0.64		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	1.9		4.3	4.4		1.9	13.7		1.0	16.3	4.6
Delay (s)	65.1	28.5		67.1	26.5		43.4	58.2		41.0	59.7	46.2
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		38.0			31.2			54.5			49.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3435		1770	3488		1770	3471	
Flt Permitted	0.14	1.00			0.73		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	269	3426			2529		1770	3488		1770	3471	
Volume (vph)	96	588	159	44	608	142	172	909	97	181	798	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	48	661	154	187	988	105	197	867	127
RTOR Reduction (vph)	0	27	0	0	20	0	0	6	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	843	0	187	1087	0	197	985	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	36.9	36.9			36.9		15.2	45.1		15.0	44.9	
Effective Green, g (s)	36.9	36.9			36.9		15.2	46.1		15.0	45.9	
Actuated g/C Ratio	0.34	0.34			0.34		0.14	0.42		0.14	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	90	1149			848		245	1462		241	1448	
v/s Ratio Prot		0.23					0.11	c0.31		c0.11	0.28	
v/s Ratio Perm	c0.39				0.33							
v/c Ratio	1.16	0.68			0.99		0.76	0.74		0.82	0.68	
Uniform Delay, d1	36.6	31.5			36.4		45.7	27.0		46.2	26.1	
Progression Factor	1.06	1.07			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	132.6	1.4			29.3		13.2	3.5		18.9	2.6	
Delay (s)	171.5	35.0			65.7		58.8	30.4		65.1	28.7	
Level of Service	F	C			E		E	C		E	C	
Approach Delay (s)		50.5			65.7			34.6			34.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	44.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	177	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	192	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	499	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	499	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	82	100	100	100
cM capacity (veh/h)	1598			1595			603	556	1057	368	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	196	2
Volume Left	1	133	2	1
Volume Right	0	0	192	0
cSH	1598	1595	1043	443
Volume to Capacity	0.00	0.08	0.19	0.00
Queue Length 95th (ft)	0	7	17	0
Control Delay (s)	0.4	6.6	9.2	13.2
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.2	13.2
Approach LOS			A	B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	138	78	6	190	85	106	10	374	259	16	293	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	85	7	207	92	115	11	407	282	17	318	72

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	150	91	207	208	699	17	390
Volume Left (vph)	150	0	207	0	11	17	0
Volume Right (vph)	0	7	0	115	282	0	72
Hadj (s)	0.53	-0.02	0.53	-0.35	-0.20	0.53	-0.09
Departure Headway (s)	9.2	8.6	8.8	7.9	7.6	8.5	7.9
Degree Utilization, x	0.38	0.22	0.50	0.46	1.48	0.04	0.85
Capacity (veh/h)	368	398	398	442	475	415	451
Control Delay (s)	16.6	12.9	19.2	16.2	246.4	10.6	40.5
Approach Delay (s)	15.2		17.7		246.4	39.3	
Approach LOS	C		C		F	E	

Intersection Summary				
Delay	113.1			
HCM Level of Service	F			
Intersection Capacity Utilization	72.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	353	0	0	381	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	384	0	0	414	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			384		798	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		798	384
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1175		355	664

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	384	414	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1175	1700
Volume to Capacity	0.23	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	23.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1763			1803		1770	1843		1770	1741	
Flt Permitted		0.79			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1421			1600		1770	1843		1770	1741	
Volume (vph)	157	166	68	36	113	20	163	604	39	19	317	147
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	171	180	74	39	123	22	177	657	42	21	345	160
RTOR Reduction (vph)	0	13	0	0	9	0	0	4	0	0	30	0
Lane Group Flow (vph)	0	412	0	0	175	0	177	695	0	21	475	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		413			465		222	875		29	636	
v/s Ratio Prot							c0.10	c0.38		0.01	0.27	
v/s Ratio Perm		c0.29			0.11							
v/c Ratio		1.00			0.38		0.80	0.79		0.72	0.75	
Uniform Delay, d1		19.5			15.5		23.4	12.2		26.9	15.2	
Progression Factor		1.00			1.00		0.90	1.04		0.97	1.09	
Incremental Delay, d2		43.1			0.4		14.6	6.2		53.0	6.9	
Delay (s)		62.5			15.9		35.7	18.9		79.1	23.5	
Level of Service		E			B		D	B		E	C	
Approach Delay (s)		62.5			15.9			22.3			25.7	
Approach LOS		E			B			C			C	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	181	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	197	72	5	128	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	68	287	135
Volume Left (vph)	4	57	18	5
Volume Right (vph)	64	12	72	1
Hadj (s)	-0.42	0.09	-0.10	0.04
Departure Headway (s)	4.5	5.1	4.3	4.6
Degree Utilization, x	0.11	0.10	0.35	0.17
Capacity (veh/h)	712	642	800	734
Control Delay (s)	8.1	8.6	9.6	8.6
Approach Delay (s)	8.1	8.6	9.6	8.6
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.0		
HCM Level of Service	A		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	96	42	28	538	408	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	46	30	585	443	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1135	490	536			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1135	490	536			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	52	92	97			
cM capacity (veh/h)	217	579	1032			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	150	30	585	536
Volume Left	104	30	0	0
Volume Right	46	0	0	92
cSH	268	1032	1700	1700
Volume to Capacity	0.56	0.03	0.34	0.32
Queue Length 95th (ft)	79	2	0	0
Control Delay (s)	34.2	8.6	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	34.2	0.4		0.0
Approach LOS	D			

Intersection Summary			
Average Delay		4.1	
Intersection Capacity Utilization		42.9%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3393		3539	1488		3530
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3393		3539	1488		3256
Volume (vph)	655	57	483	231	24	600
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	712	62	525	251	26	652
RTOR Reduction (vph)	6	0	0	137	0	0
Lane Group Flow (vph)	768	0	525	114	0	678
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1604		1609	676		1480
v/s Ratio Prot	c0.23		0.15			
v/s Ratio Perm				0.08		c0.21
v/c Ratio	0.48		0.33	0.17		0.46
Uniform Delay, d1	19.8		19.2	17.7		20.7
Progression Factor	0.41		0.13	0.10		1.00
Incremental Delay, d2	0.9		0.2	0.2		1.0
Delay (s)	9.0		2.8	2.0		21.7
Level of Service	A		A	A		C
Approach Delay (s)	9.0		2.5			21.7
Approach LOS	A		A			C

Intersection Summary				
HCM Average Control Delay	10.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	214	34	472	648	231	240
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	37	513	704	251	261
RTOR Reduction (vph)	0	20	0	0	0	130
Lane Group Flow (vph)	233	17	513	704	251	131
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.7	51.9	28.7	83.3	51.1	19.7
Effective Green, g (s)	19.2	51.4	28.2	82.8	50.6	19.2
Actuated g/C Ratio	0.17	0.47	0.26	0.75	0.46	0.17
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	309	740	880	1402	857	276
v/s Ratio Prot	c0.13	0.01	c0.15	c0.38	0.13	0.08
v/s Ratio Perm						
v/c Ratio	0.75	0.02	0.58	0.50	0.29	0.48
Uniform Delay, d1	43.2	15.8	35.8	5.4	18.5	40.9
Progression Factor	0.49	0.01	0.61	0.38	1.00	1.00
Incremental Delay, d2	9.6	0.0	0.8	1.0	0.9	1.3
Delay (s)	30.7	0.2	22.6	3.1	19.4	42.2
Level of Service	C	A	C	A	B	D
Approach Delay (s)	26.5			11.3	31.0	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	18.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1826	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1826	
Volume (vph)	172	370	60	497	14	0	11	649	1241	252	528	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	540	15	0	12	705	1349	274	574	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	270	285	0	12	705	1349	274	622	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.4	16.4	16.4	18.4	18.4		1.1	22.8	89.7	16.6	38.3	
Effective Green, g (s)	15.9	15.9	15.9	18.4	18.4		0.6	23.3	89.7	16.1	38.8	
Actuated g/C Ratio	0.18	0.18	0.18	0.21	0.21		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	314	330	281	345	347		12	919	1583	318	790	
v/s Ratio Prot	0.11	c0.22		0.16	0.17		0.01	0.20		0.15	0.34	
v/s Ratio Perm			0.03						c0.85			
v/c Ratio	0.60	1.22	0.17	0.78	0.82		1.00	0.77	0.85	0.86	0.79	
Uniform Delay, d1	33.9	36.9	31.3	33.8	34.1		44.6	30.7	0.0	35.7	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	122.6	0.1	10.6	14.1		259.8	3.7	6.0	20.0	5.0	
Delay (s)	36.0	159.5	31.4	44.4	48.2		304.4	34.4	6.0	55.7	26.9	
Level of Service	D	F	C	D	D		F	C	A	E	C	
Approach Delay (s)		111.4			46.3			17.4			35.7	
Approach LOS		F			D			B			D	

Intersection Summary				
HCM Average Control Delay	39.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			2977	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			2977	1399				3433		1583
Volume (vph)	140	394	572	0	521	1662	0	0	0	796	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	1807	0	0	0	865	0	359
RTOR Reduction (vph)	0	217	0	0	178	0	0	0	0	0	0	239
Lane Group Flow (vph)	152	833	0	0	1043	1152	0	0	0	865	0	120
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	70.1			46.1	110.0				31.4		31.4
Effective Green, g (s)	20.0	70.1			46.1	110.0				31.9		31.9
Actuated g/C Ratio	0.18	0.64			0.42	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2055			1248	1399				996		459
v/s Ratio Prot	0.09	0.26			0.35							0.08
v/s Ratio Perm						c0.82				0.25		
v/c Ratio	0.47	0.41			0.84	0.82				0.87		0.26
Uniform Delay, d1	40.3	9.8			28.6	0.0				37.1		30.0
Progression Factor	1.00	1.00			0.64	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			0.7	0.5				8.1		0.2
Delay (s)	40.7	10.4			18.9	0.5				45.1		30.2
Level of Service	D	B			B	A				D		C
Approach Delay (s)		14.2			10.0			0.0			40.8	
Approach LOS		B			A			A			D	

Intersection Summary				
HCM Average Control Delay	18.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1525	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1525	659			
Volume (vph)	141	1049	0	0	1633	475	550	226	916	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1140	0	0	1775	516	598	246	996	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	66	13	0	0	0
Lane Group Flow (vph)	153	1140	0	0	1775	253	598	678	485	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	513	335			
v/s Ratio Prot	0.09	c0.32			c0.38		0.36	0.44	c0.74			
v/s Ratio Perm						0.19						
v/c Ratio	0.45	0.77			1.05	0.52	1.06	1.32	1.45			
Uniform Delay, d1	39.4	27.4			35.0	27.4	36.5	36.5	27.0			
Progression Factor	1.55	0.38			0.93	1.18	1.00	1.00	1.00			
Incremental Delay, d2	3.2	2.8			32.0	2.1	54.3	157.6	217.3			
Delay (s)	64.3	13.2			64.7	34.3	90.8	194.1	244.3			
Level of Service	E	B			E	C	F	F	F			
Approach Delay (s)		19.3			57.9			174.1			0.0	
Approach LOS		B			E			F			A	

Intersection Summary				
HCM Average Control Delay	88.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.28			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1812	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1812	2628
Volume (vph)	530	765	671	259	989	205	132	16	66	211	163	872
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	832	729	282	1075	223	143	17	72	229	177	948
RTOR Reduction (vph)	0	7	140	0	0	29	0	0	63	0	0	85
Lane Group Flow (vph)	576	918	496	282	1075	194	78	82	9	0	406	863
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	c0.17	0.28	c0.41	0.16	c0.30		0.05	0.05			c0.22	0.33
v/s Ratio Perm						0.12			0.01			
v/c Ratio	1.08	0.92	0.88	1.03	1.01	0.41	0.36	0.38	0.05		0.82	0.77
Uniform Delay, d1	46.5	37.2	26.7	46.5	38.5	30.7	43.9	44.0	42.1		37.5	26.9
Progression Factor	1.24	1.00	1.06	1.00	1.00	1.00	1.02	1.02	2.14		0.76	0.59
Incremental Delay, d2	41.7	1.8	1.6	62.1	30.7	2.6	0.7	0.8	0.1		13.0	4.6
Delay (s)	99.3	39.0	29.9	108.6	69.2	33.3	45.7	45.8	90.1		41.6	20.4
Level of Service	F	D	C	F	E	C	D	D	F		D	C
Approach Delay (s)		52.6			71.2			59.5			26.7	
Approach LOS		D			E			E			C	

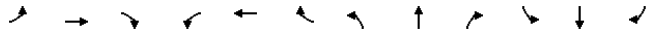
Intersection Summary				
HCM Average Control Delay	51.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	949	25	0	265	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	1032	27	0	288	0
RTOR Reduction (vph)	0	0	404	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	369	51	0	7	0	1057	0	0	288	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.13	c0.03				c0.30			0.15	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.29	0.42		0.07		0.66			0.43	
Uniform Delay, d1	23.1	23.0	18.2	49.2		48.0		23.4			26.8	
Progression Factor	1.23	1.22	3.03	1.00		1.00		1.00			1.55	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		2.2			2.0	
Delay (s)	28.8	28.3	55.1	50.9		48.2		25.5			43.4	
Level of Service	C	C	E	D		D		C			D	
Approach Delay (s)		48.9			49.1			25.5			43.4	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM Average Control Delay	38.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3416		1770	3467		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3416		1770	3467		1770	1843		1770	1863	1537
Volume (vph)	169	684	145	20	573	55	507	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	743	158	22	623	60	551	455	29	63	215	170
RTOR Reduction (vph)	0	16	0	0	6	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	885	0	22	677	0	551	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		46.0	46.0		16.0	16.0	16.0
Effective Green, g (s)	10.0	30.9		2.1	23.0		45.5	45.5		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	960		34	725		732	762		249	263	217
v/s Ratio Prot	c0.10	c0.26		0.01	c0.20		c0.31	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.14	0.92		0.65	0.93		0.75	0.63		0.25	0.82	0.11
Uniform Delay, d1	50.0	38.4		53.6	42.7		27.5	25.6		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.00		1.07	1.04	1.76
Incremental Delay, d2	114.5	15.4		35.3	20.6		4.3	1.7		0.5	16.7	0.2
Delay (s)	164.5	53.8		88.8	63.4		31.4	27.3		45.6	64.3	72.9
Level of Service	F	D		F	E		C	C		D	E	E
Approach Delay (s)		72.6			64.1			29.5			64.9	
Approach LOS		E			E			C			E	

Intersection Summary				
HCM Average Control Delay	56.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3409		1770	3466		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3409		1770	3466		1770	3483		1770	3483	
Volume (vph)	128	574	186	100	378	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	624	202	109	411	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	35	0	0	15	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	791	0	109	462	0	152	1179	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.2		8.4	22.2		11.9	32.4		10.0	30.5	
Effective Green, g (s)	9.4	24.7		7.4	22.7		10.9	32.9		9.0	31.0	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.12	0.37		0.10	0.34	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	936		146	874		214	1273		177	1200	
v/s Ratio Prot	c0.08	c0.23		0.06	0.13		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.85		0.75	0.53		0.71	0.93		0.69	0.87	
Uniform Delay, d1	39.2	30.8		40.4	29.0		38.0	27.4		39.1	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	7.1		18.6	0.6		10.6	12.8		10.6	8.7	
Delay (s)	54.9	37.9		59.0	29.6		48.6	40.2		49.8	36.3	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		40.4			35.1			41.2			37.7	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3382		1770	3539	1524	1770	1685			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3382		1770	3539	1524	1770	1685			1805	
Volume (vph)	24	596	203	80	599	27	215	106	108	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	648	221	87	651	29	234	115	117	46	115	21
RTOR Reduction (vph)	0	25	0	0	0	15	0	41	0	0	5	0
Lane Group Flow (vph)	26	844	0	87	651	14	234	191	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	44.0		7.9	48.7	48.7	17.9	17.9			15.7	
Effective Green, g (s)	2.7	44.0		7.4	48.7	48.7	17.4	17.4			15.2	
Actuated g/C Ratio	0.03	0.44		0.07	0.49	0.49	0.17	0.17			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1488		131	1723	742	308	293			274	
v/s Ratio Prot	0.01	c0.25		c0.05	0.18		c0.13	0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.57		0.66	0.38	0.02	0.76	0.65			0.65	
Uniform Delay, d1	48.0	20.9		45.1	16.1	13.3	39.3	38.5			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.6		10.8	0.6	0.0	9.8	4.6			4.6	
Delay (s)	57.5	22.5		55.9	16.8	13.3	49.1	43.0			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		23.5			21.1			46.1			44.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1496	1770	1863	1520	1770	1811	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3418		1770	3539	1496	1770	1863	1520	1770	1811	
Volume (vph)	46	544	124	141	498	180	191	275	115	177	303	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	135	153	541	196	208	299	125	192	329	55
RTOR Reduction (vph)	0	18	0	0	0	113	0	0	96	0	6	0
Lane Group Flow (vph)	50	708	0	153	541	83	208	299	29	192	378	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	37.1		12.2	42.6	42.6	12.5	23.8	23.8	12.4	23.7	
Effective Green, g (s)	6.2	37.1		11.7	42.6	42.6	12.0	23.3	23.3	11.9	23.2	
Actuated g/C Ratio	0.06	0.37		0.12	0.43	0.43	0.12	0.23	0.23	0.12	0.23	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1268		207	1508	637	212	434	354	211	420	
v/s Ratio Prot	0.03	c0.21		c0.09	0.15		c0.12	0.16		0.11	c0.21	
v/s Ratio Perm						0.06			0.02			
v/c Ratio	0.45	0.56		0.74	0.36	0.13	0.98	0.69	0.08	0.91	0.90	
Uniform Delay, d1	45.3	25.0		42.7	19.4	17.4	43.9	35.0	30.0	43.5	37.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.96	
Incremental Delay, d2	2.2	1.8		12.2	0.7	0.4	56.1	4.1	0.1	36.4	20.7	
Delay (s)	47.4	26.7		54.9	20.1	17.9	100.0	39.2	30.1	78.7	56.5	
Level of Service	D	C		D	C	B	F	D	C	E	E	
Approach Delay (s)		28.1			25.6			57.4			63.9	
Approach LOS		C			C			E			E	

Intersection Summary				
HCM Average Control Delay	40.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	760	44	96	812	12	33	12	98	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	826	48	104	883	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	896			874			1562	2002	437	1672	2020	448
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	896			874			1562	2002	437	1672	2020	448
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			86			36	74	81	100	82	98
cM capacity (veh/h)	753			768			56	49	567	36	48	558

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	551	323	104	588	307	42	113	18
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	753	1700	1700	768	1700	1700	55	353	93
Volume to Capacity	0.03	0.32	0.19	0.14	0.35	0.18	0.77	0.32	0.20
Queue Length 95th (ft)	2	0	0	12	0	0	82	34	17
Control Delay (s)	9.9	0.0	0.0	10.4	0.0	0.0	177.6	19.9	52.9
Lane LOS	A			B			F	C	F
Approach Delay (s)	0.3			1.1			62.9		52.9
Approach LOS							F		F

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3450		1770	3481			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3450		1770	3481			1808	1555		1811	
Volume (vph)	30	768	101	124	733	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	835	110	135	797	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	937	0	135	854	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	37.5		11.4	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.5		10.9	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.08	0.38		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1294		193	1399			380	327		264	
v/s Ratio Prot	0.02	c0.27		c0.08	0.25			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.72		0.70	0.61			0.86	0.22		0.71	
Uniform Delay, d1	42.9	26.8		43.0	23.7			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.19	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	3.5		3.5	0.7			17.8	0.3		7.8	
Delay (s)	43.5	30.4		54.5	15.3			55.9	33.0		48.4	
Level of Service	D	C		D	B			E	C		D	
Approach Delay (s)		30.8			20.6			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM Average Control Delay	31.5	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3294		1770	3372		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3294		1770	3372		3433	3529		1770	3467	
Volume (vph)	205	531	297	46	397	146	420	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	577	323	50	432	159	457	1035	16	241	1052	111
RTOR Reduction (vph)	0	76	0	0	38	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	824	0	50	553	0	457	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.3	28.6		5.6	18.9		14.0	37.5		15.3	38.8	
Effective Green, g (s)	14.3	27.6		4.6	17.9		13.0	37.5		14.3	38.8	
Actuated g/C Ratio	0.14	0.28		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	253	909		81	604		446	1323		253	1345	
v/s Ratio Prot	c0.13	c0.25		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.88	0.91		0.62	0.92		1.02	0.79		0.95	0.86	
Uniform Delay, d1	42.0	35.0		46.8	40.3		43.5	27.8		42.5	28.1	
Progression Factor	0.63	0.78		1.03	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.0	9.8		9.1	17.8		49.0	5.0		43.1	7.3	
Delay (s)	48.3	37.0		57.3	55.2		92.5	32.8		85.6	35.4	
Level of Service	D	D		E	E		F	C		F	D	
Approach Delay (s)		39.3			55.3			50.9			44.0	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	46.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3440			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3440			3156			2746	
Volume (vph)	16	651	16	9	459	89	19	212	23	75	166	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	708	17	10	499	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	23	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	722	0	10	573	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1968			549			478	
v/s Ratio Prot	c0.01	c0.20		0.01	0.17							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.36		0.48	0.29			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.23		1.00	1.00			1.00			1.00	
Incremental Delay, d2	20.3	0.2		6.1	0.4			0.6			1.9	
Delay (s)	45.0	7.2		30.6	5.9			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.1			6.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	304	75	11	86	78	46	19	83	50	65	59	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	330	82	12	93	85	50	21	90	54	71	64	229

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	330	93	228	165	364
Volume Left (vph)	330	0	93	21	71
Volume Right (vph)	0	12	50	54	229
Hadj (s)	0.53	-0.06	-0.02	-0.14	-0.31
Departure Headway (s)	7.2	6.6	6.7	6.7	6.1
Degree Utilization, x	0.66	0.17	0.42	0.31	0.61
Capacity (veh/h)	470	518	485	464	559
Control Delay (s)	22.1	9.8	14.4	12.7	18.1
Approach Delay (s)	19.4		14.4	12.7	18.1
Approach LOS	C		B	B	C

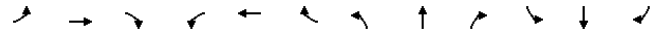
Intersection Summary				
Delay	17.1			
HCM Level of Service	C			
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#3 PM

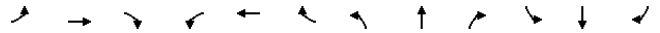
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	

Intersection Summary					
HCM Average Control Delay	11.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	46.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3510			3501	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3510			3501	
Volume (vph)	73	162	14	96	123	36	0	1123	66	0	1221	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1221	72	0	1327	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1290	0	0	1426	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2161	
v/s Ratio Prot					c0.08			0.37			c0.41	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.60			0.66	
Uniform Delay, d1		42.7			43.5			12.2			13.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.6	
Delay (s)		46.7			45.4			13.4			14.6	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.4			14.6	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3184			5073	
Volume (vph)	0	0	0	64	237	549	19	828	0	0	1208	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	900	0	0	1313	22
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	487	0	921	0	0	1333	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1946			3100	
v/s Ratio Prot					0.09						0.26	
v/s Ratio Perm						c0.31		c0.29				
v/c Ratio					0.31	1.03		0.47			0.43	
Uniform Delay, d1					24.3	31.5		9.6			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	47.9		0.8			0.4	
Delay (s)					24.4	79.4		10.4			9.7	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			59.9			10.4			9.7	
Approach LOS		A			E			B			A	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3492		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3492		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	795	78	592	716	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	864	85	643	778	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	943	0	643	778	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	78.2	
Effective Green, g (s)		23.8						49.1		25.1	78.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1559		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.22	
v/s Ratio Perm												
v/c Ratio		0.82						0.61		0.82	0.31	
Uniform Delay, d1		41.1						23.1		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.8		6.6	0.0	
Delay (s)		48.0						24.8		46.9	5.9	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.8			24.5	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	181	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	197	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	399	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			208	201	13	399	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	82	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	437	658	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	200	12
Volume Left	0	87	0	1
Volume Right	0	1	197	3
cSH	1604	1605	1056	699
Volume to Capacity	0.00	0.05	0.19	0.02
Queue Length 95th (ft)	0	4	17	1
Control Delay (s)	0.0	6.4	9.2	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	9.2	10.2
Approach LOS			A	B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	127	35	13	202	42	20	13	358	288	17	460	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	138	38	14	220	46	22	14	389	313	18	500	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	138	52	220	67	716	18	542
Volume Left (vph)	138	0	220	0	14	18	0
Volume Right (vph)	0	14	0	22	313	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.22	0.53	-0.02
Departure Headway (s)	9.3	8.6	8.9	8.2	7.3	8.0	7.5
Degree Utilization, x	0.36	0.12	0.54	0.15	1.46	0.04	1.13
Capacity (veh/h)	380	408	396	429	493	441	485
Control Delay (s)	16.1	11.6	20.9	11.5	239.4	10.2	105.4
Approach Delay (s)	14.9		18.7		239.4	102.3	
Approach LOS	B		C		F	F	

Intersection Summary			
Delay	135.1		
HCM Level of Service	F		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

Existing Plus Alt#3 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	89	0	0	110	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	0	0	120	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			97		216	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			97		216	97
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1497		772	960

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	97	120	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1497	1700
Volume to Capacity	0.06	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	9.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	165	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	179	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	254	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	-0.49	0.00	-0.13	0.04
Departure Headway (s)	4.2	4.6	4.0	4.4
Degree Utilization, x	0.02	0.08	0.29	0.08
Capacity (veh/h)	781	722	868	784
Control Delay (s)	7.3	8.0	8.6	7.8
Approach Delay (s)	7.3	8.0	8.6	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.3	
HCM Level of Service			A	
Intersection Capacity Utilization		31.5%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	109	36	28	592	563	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	118	39	30	643	612	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1382	677	742			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1382	677	742			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	23	91	96			
cM capacity (veh/h)	153	453	865			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	30	643	742
Volume Left	118	30	0	0
Volume Right	39	0	0	130
cSH	183	865	1700	1700
Volume to Capacity	0.86	0.04	0.38	0.44
Queue Length 95th (ft)	156	3	0	0
Control Delay (s)	85.9	9.3	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	85.9	0.4		0.0
Approach LOS	F			

Intersection Summary				
Average Delay			8.8	
Intersection Capacity Utilization		51.8%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

Existing Plus Alt#3 SAT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3389		3539	1492		3530
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3389		3539	1492		3243
Volume (vph)	845	76	498	412	26	623
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	918	83	541	448	28	677
RTOR Reduction (vph)	6	0	0	226	0	0
Lane Group Flow (vph)	995	0	541	222	0	705
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.51		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1725		1480	624		1356
v/s Ratio Prot	c0.29		0.15			
v/s Ratio Perm				0.15		c0.22
v/c Ratio	0.58		0.37	0.36		0.52
Uniform Delay, d1	18.8		22.0	21.9		23.8
Progression Factor	0.31		0.56	1.96		1.00
Incremental Delay, d2	1.2		0.2	0.5		1.4
Delay (s)	7.1		12.5	43.2		25.2
Level of Service	A		B	D		C
Approach Delay (s)	7.1		26.4			25.2
Approach LOS	A		C			C

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	371	51	660	867	283	277
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	403	55	717	942	308	301
RTOR Reduction (vph)	0	25	0	0	0	23
Lane Group Flow (vph)	403	30	717	942	308	278
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	28.6	61.0	28.9	74.4	42.0	74.1
Effective Green, g (s)	28.1	60.5	28.4	73.9	41.5	73.6
Actuated g/C Ratio	0.26	0.55	0.26	0.67	0.38	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	452	871	886	1252	703	1059
v/s Ratio Prot	c0.23	0.02	c0.21	c0.51	0.17	0.18
v/s Ratio Perm						
v/c Ratio	0.89	0.03	0.81	0.75	0.44	0.26
Uniform Delay, d1	39.5	11.4	38.3	12.0	25.6	7.3
Progression Factor	0.38	0.01	0.42	1.36	1.00	1.00
Incremental Delay, d2	17.2	0.0	3.3	2.5	2.0	0.1
Delay (s)	32.2	0.1	19.2	18.8	27.5	7.4
Level of Service	C	A	B	B	C	A
Approach Delay (s)	28.3			19.0	17.6	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1834	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1834	
Volume (vph)	26	21	7	815	13	16	41	259	1054	120	409	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	886	14	17	45	282	1146	130	445	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	465	451	0	45	282	1146	130	476	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.6	26.6		3.9	17.7	71.2	8.0	21.8	
Effective Green, g (s)	2.9	2.9	2.9	26.6	26.6		3.4	18.2	71.2	7.5	22.3	
Actuated g/C Ratio	0.04	0.04	0.04	0.37	0.37		0.05	0.26	1.00	0.11	0.31	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	64	628	628		85	905	1583	186	574	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.08		0.07	c0.26	
v/s Ratio Perm			0.00						c0.72			
v/c Ratio	0.39	0.30	0.01	0.74	0.72		0.53	0.31	0.72	0.70	0.83	
Uniform Delay, d1	33.3	33.2	32.8	19.3	19.1		33.1	21.4	0.0	30.8	22.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.4	3.7		2.7	0.1	2.9	8.9	9.5	
Delay (s)	34.6	34.0	32.8	23.8	22.7		35.8	21.6	2.9	39.7	32.2	
Level of Service	C	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.1			23.3			7.5			33.8	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	18.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	71.2	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	67.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3014	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3014	1399				3433		1583
Volume (vph)	113	273	0	0	353	1254	0	0	0	1001	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1363	0	0	0	1088	0	263
RTOR Reduction (vph)	0	0	0	0	122	0	0	0	0	0	0	158
Lane Group Flow (vph)	123	297	0	0	627	998	0	0	0	1088	0	105
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	62.5			47.2	110.0				39.0		39.0
Effective Green, g (s)	11.3	62.5			47.2	110.0				39.5		39.5
Actuated g/C Ratio	0.10	0.57			0.43	1.00				0.36		0.36
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2011			1293	1399				1233		568
v/s Ratio Prot	0.07	0.08			0.21							0.07
v/s Ratio Perm						c0.71				c0.32		
v/c Ratio	0.68	0.15			0.49	0.71				0.88		0.19
Uniform Delay, d1	47.6	11.2			22.6	0.0				33.1		24.2
Progression Factor	1.00	1.00			0.95	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			0.9	2.1				7.7		0.1
Delay (s)	55.2	11.4			22.3	2.1				40.8		24.3
Level of Service	E	B			C	A				D		C
Approach Delay (s)		24.2			10.7			0.0			37.6	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1451	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1451	659			
Volume (vph)	111	1163	0	0	1235	439	372	21	1065	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1264	0	0	1342	477	404	23	1158	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	304	0	162	2	0	0	0
Lane Group Flow (vph)	121	1264	0	0	1342	173	404	440	577	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	633	389			
v/s Ratio Prot	0.07	c0.36			c0.29		0.24	0.30	c0.87			
v/s Ratio Perm						0.12						
v/c Ratio	0.74	1.06			0.80	0.33	0.55	0.69	1.48			
Uniform Delay, d1	48.6	36.5			31.5	25.4	23.0	25.1	22.5			
Progression Factor	1.21	0.59			0.85	1.24	1.00	1.00	1.00			
Incremental Delay, d2	11.7	40.0			2.9	1.1	3.0	6.2	230.4			
Delay (s)	70.4	61.4			29.7	32.7	26.0	31.3	252.9			
Level of Service	E	E			C	C	C	C	F			
Approach Delay (s)		62.2			30.5			110.9			0.0	
Approach LOS		E			C			F			A	

Intersection Summary				
HCM Average Control Delay	66.3	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.36			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1824	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1824	2628
Volume (vph)	637	450	1141	270	442	216	227	62	101	197	270	993
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	692	489	1240	293	480	235	247	67	110	214	293	1079
RTOR Reduction (vph)	0	209	95	0	0	97	0	0	98	0	0	78
Lane Group Flow (vph)	692	900	525	293	480	138	153	161	12	0	507	1001
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		497	1266
v/s Ratio Prot	c0.20	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.28	0.38
v/s Ratio Perm						0.09			0.01			
v/c Ratio	1.17	0.94	1.01	1.07	0.45	0.30	0.84	0.86	0.07		1.02	0.79
Uniform Delay, d1	45.5	36.4	31.5	46.5	31.2	29.6	48.0	48.2	44.0		40.0	23.9
Progression Factor	1.27	1.02	1.05	1.00	1.00	1.00	1.26	1.26	2.47		0.75	1.24
Incremental Delay, d2	77.0	2.3	13.7	74.0	1.4	1.7	23.7	26.6	0.1		42.2	4.3
Delay (s)	134.6	39.7	46.9	120.5	32.6	31.3	84.3	87.3	108.7		72.1	33.8
Level of Service	F	D	D	F	C	C	F	F	F		E	C
Approach Delay (s)		68.6			57.8			91.8			46.1	
Approach LOS		E			E			F			D	

Intersection Summary				
HCM Average Control Delay	61.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	99.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3531			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3531			1863	
Volume (vph)	105	218	1025	51	0	120	0	1302	21	0	336	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1415	23	0	365	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1437	0	0	365	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	8.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.41			0.20	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.88			0.56	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		26.7			28.7	
Progression Factor	1.19	1.19	1.56	1.00		1.00		0.68			1.03	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		5.7			3.2	
Delay (s)	29.8	29.4	40.3	50.9		48.1		23.9			32.7	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.7			48.9			23.9			32.7	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	32.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Volume (vph)	66	458	208	37	592	35	230	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	498	226	40	643	38	250	163	24	38	190	97
RTOR Reduction (vph)	0	61	0	0	5	0	0	8	0	0	0	83
Lane Group Flow (vph)	72	663	0	40	676	0	250	179	0	38	190	14
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Effective Green, g (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Actuated g/C Ratio	0.05	0.40		0.02	0.37		0.17	0.17		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	85	1337		38	1301		296	305		261	275	228
v/s Ratio Prot	c0.04	c0.20		0.02	0.19		c0.14	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.50		1.05	0.52		0.84	0.59		0.15	0.69	0.06
Uniform Delay, d1	28.5	13.6		29.5	14.8		24.3	23.2		22.4	24.4	22.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	50.4	0.3		162.1	0.4		19.3	2.9		0.3	7.3	0.1
Delay (s)	78.9	13.9		191.6	15.1		43.6	26.0		22.6	31.7	22.2
Level of Service	E	B		F	B		D	C		C	C	C
Approach Delay (s)		19.8			24.9			36.1			27.8	
Approach LOS		B			C			D			C	

Intersection Summary				
HCM Average Control Delay	25.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3463		1770	3515			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3463		1770	3515			1801	1555		1772	
Volume (vph)	18	864	96	152	958	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	939	104	165	1041	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	1037	0	165	1072	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1558		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.30		c0.09	0.30			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.67		0.84	0.55			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.6		43.6	14.6			40.0	36.2		39.7	
Progression Factor	1.06	0.43		0.82	0.65			1.00	1.00		1.00	
Incremental Delay, d2	211.4	2.0		16.9	0.7			7.7	0.2		0.4	
Delay (s)	264.0	11.3		52.6	10.2			47.7	36.3		40.0	
Level of Service	F	B		D	B			D	D		D	
Approach Delay (s)		16.0			15.8			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3070		1770	3394		3433	3501		1770	3282	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3070		1770	3394		3433	3501		1770	3282	
Volume (vph)	166	532	336	69	431	65	481	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	578	365	75	468	71	523	701	27	123	743	200
RTOR Reduction (vph)	0	98	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	845	0	75	527	0	523	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.3		5.2	24.4		16.5	35.7		10.8	30.0	
Effective Green, g (s)	12.6	32.3		4.7	24.4		16.0	36.7		10.3	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.37		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	992		83	828		549	1285		182	1017	
v/s Ratio Prot	c0.10	c0.28		0.04	0.16		c0.15	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.85		0.90	0.64		0.95	0.56		0.68	0.90	
Uniform Delay, d1	42.5	31.6		47.4	33.8		41.6	25.3		43.2	33.1	
Progression Factor	1.15	0.39		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.1	7.7		66.1	3.7		26.7	1.8		7.6	12.8	
Delay (s)	63.9	20.0		113.5	37.5		68.3	27.1		50.8	45.9	
Level of Service	E	C		F	D		E	C		D	D	
Approach Delay (s)		27.1			46.8			44.3			46.4	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #3
2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3392		1770	3518		1770	3424		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3392		1770	3518		1770	3424		1770	1863	1583
Volume (vph)	514	847	324	104	742	30	117	225	63	61	212	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	341	109	781	32	123	237	66	64	223	208
RTOR Reduction (vph)	0	32	0	0	2	0	0	24	0	0	0	176
Lane Group Flow (vph)	541	1201	0	109	811	0	123	279	0	64	223	32
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	52.4		10.7	28.5		13.2	13.2		16.7	16.7	16.7
Effective Green, g (s)	34.6	53.4		10.7	29.5		13.2	13.2		16.7	16.7	16.7
Actuated g/C Ratio	0.31	0.49		0.10	0.27		0.12	0.12		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1647		172	943		212	411		269	283	240
v/s Ratio Prot	c0.31	0.35		0.06	c0.23		0.07	c0.08		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.73		0.63	0.86		0.58	0.68		0.24	0.79	0.13
Uniform Delay, d1	37.2	22.5		47.8	38.3		45.8	46.4		41.1	44.9	40.4
Progression Factor	1.00	1.00		0.90	1.28		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	2.9		5.2	7.2		3.3	4.0		0.5	13.5	0.2
Delay (s)	68.0	25.4		48.2	56.3		49.1	50.4		41.5	58.4	40.6
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.4			55.3			50.0			48.8	
Approach LOS		D			E			D			D	

Intersection Summary					
HCM Average Control Delay	45.5	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	80.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3437		1770	3482		1770	3449	
Flt Permitted	0.21	1.00			0.67		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	388	3453			2303		1770	3482		1770	3449	
Volume (vph)	122	709	137	58	551	123	194	660	80	118	750	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	61	580	129	204	695	84	124	789	162
RTOR Reduction (vph)	0	17	0	0	17	0	0	7	0	0	14	0
Lane Group Flow (vph)	128	873	0	0	753	0	204	772	0	124	937	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	39.3	39.3			39.3		15.2	41.7		16.0	42.5	
Effective Green, g (s)	39.3	39.3			39.3		15.2	42.7		16.0	43.5	
Actuated g/C Ratio	0.36	0.36			0.36		0.14	0.39		0.15	0.40	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	139	1234			823		245	1352		257	1364	
v/s Ratio Prot		0.25					c0.12	0.22		0.07	c0.27	
v/s Ratio Perm	c0.33				0.33							
v/c Ratio	0.92	0.71			0.91		0.83	0.57		0.48	0.69	
Uniform Delay, d1	33.9	30.4			33.7		46.2	26.4		43.2	27.6	
Progression Factor	0.46	0.51			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	42.5	1.3			14.5		20.8	1.8		1.4	2.8	
Delay (s)	58.1	16.7			48.3		67.0	28.2		44.6	30.4	
Level of Service	E	B			D		E	C		D	C	
Approach Delay (s)		21.9			48.3			36.3			32.1	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	33.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	102	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	107	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	332	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	332	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	90	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	538	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	109	1
Volume Left	0	81	2	0
Volume Right	2	1	107	0
cSH	1545	1616	1068	640
Volume to Capacity	0.00	0.05	0.10	0.00
Queue Length 95th (ft)	0	4	9	0
Control Delay (s)	0.0	4.4	8.8	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.8	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 3 AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	66	61	5	95	47	112	11	167	86	119	227	90	259	8	25	195	59	10

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	132	254	264	436	267	220	69
Delay	30.6	0.4	30.1	19.8	0.1	31.3	33.1
LOS	C	A	C	B	A	C	C

HCM Average Control Delay	**26.6**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.89			0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1777		1770	1783	
Flt Permitted	0.95	1.00		0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1665			1743		1770	1783	
Volume (vph)	66	61	5	95	47	112	11	167	86	119	227	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	64	5	100	49	118	12	176	91	125	239	95
RTOR Reduction (vph)	0	3	0	0	74	0	0	13	0	0	11	0
Lane Group Flow (vph)	69	66	0	100	93	0	0	266	0	125	323	0
Turn Type	Split			Split			Perm			Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8					
Actuated Green, G (s)	8.4	8.4		22.7	22.7			16.6		9.8	30.4	
Effective Green, g (s)	8.4	8.4		22.7	22.7			16.6		9.8	30.4	
Actuated g/C Ratio	0.11	0.11		0.31	0.31			0.23		0.13	0.41	
Clearance Time (s)	4.0	4.0						4.0		4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5		2.0	2.5	
Lane Grp Cap (vph)	202	211		547	514			394		236	737	
v/s Ratio Prot	c0.04	0.04		c0.06	0.06					c0.07	0.18	
v/s Ratio Perm								c0.15				
v/c Ratio	0.34	0.31		0.18	0.18			0.67		0.53	0.44	
Uniform Delay, d1	30.0	29.9		18.6	18.6			26.0		29.7	15.4	
Progression Factor	1.00	1.00		0.04	0.00			1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.6		0.1	0.1			4.1		1.0	0.3	
Delay (s)	30.7	30.5		0.9	0.1			30.1		30.7	15.7	
Level of Service	C	C		A	A			C		C	B	
Approach Delay (s)		30.6			0.4			30.1			19.8	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	19.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1856		1770	1863	1751	
Flt Permitted	1.00		0.31	1.00	0.96	
Satd. Flow (perm)	1856		587	1863	1751	
Volume (vph)	259	8	25	195	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	8	26	205	62	11
RTOR Reduction (vph)	1	0	0	0	6	0
Lane Group Flow (vph)	280	0	26	205	67	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	59.5		12.7	12.7	6.0	
Effective Green, g (s)	59.5		12.7	12.7	6.0	
Actuated g/C Ratio	0.81		0.17	0.17	0.08	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1502		101	322	143	
v/s Ratio Prot	c0.15			c0.11	c0.04	
v/s Ratio Perm			0.04			
v/c Ratio	0.19		0.26	0.64	0.47	
Uniform Delay, d1	1.6		26.3	28.3	32.2	
Progression Factor	0.02		1.00	1.00	1.00	
Incremental Delay, d2	0.0		1.0	3.6	0.9	
Delay (s)	0.1		27.3	31.8	33.1	
Level of Service	A		C	C	C	
Approach Delay (s)	0.1			31.3	33.1	
Approach LOS	A			C	C	

Intersection Summary				
HCM Average Control Delay	16.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1729			1827		1770	1850		1770	1819	
Flt Permitted		0.90			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1581			1444		1770	1850		1770	1819	
Volume (vph)	75	90	132	37	80	4	36	293	14	23	443	83
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	95	139	39	84	4	38	308	15	24	466	87
RTOR Reduction (vph)	0	58	0	0	2	0	0	3	0	0	11	0
Lane Group Flow (vph)	0	255	0	0	125	0	38	320	0	24	542	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		316			289		85	1003		32	931	
v/s Ratio Prot							c0.02	0.17		0.01	c0.30	
v/s Ratio Perm		c0.16			0.09							
v/c Ratio		0.81			0.43		0.45	0.32		0.75	0.58	
Uniform Delay, d1		19.1			17.5		23.2	6.3		24.4	8.5	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		13.7			0.8		2.7	0.8		62.8	2.7	
Delay (s)		32.8			18.3		23.0	8.2		87.2	11.1	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		32.8			18.3			9.7			14.3	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	101	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	106	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	196	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.15	0.00
Departure Headway (s)	4.3	4.7	4.0	4.3
Degree Utilization, x	0.01	0.09	0.22	0.10
Capacity (veh/h)	764	717	865	814
Control Delay (s)	7.4	8.1	8.2	7.8
Approach Delay (s)	7.4	8.1	8.2	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.1		
HCM Level of Service	A		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	79	24	23	202	284	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	25	24	213	299	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	583	322	345			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583	322	345			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	96	98			
cM capacity (veh/h)	465	719	1214			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	108	24	213	345
Volume Left	83	24	0	0
Volume Right	25	0	0	46
cSH	507	1214	1700	1700
Volume to Capacity	0.21	0.02	0.13	0.20
Queue Length 95th (ft)	20	2	0	0
Control Delay (s)	14.0	8.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.0	0.8		0.0
Approach LOS	B			

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization		31.6%	ICU Level of Service	A
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1660		1770	3539	1583		3522	
Flt Permitted		0.97	1.00	0.95	0.96		0.47	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1660		881	3539	1583		3307	
Volume (vph)	39	28	117	358	4	29	59	314	149	17	422	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	377	4	31	62	331	157	18	444	9
RTOR Reduction (vph)	0	0	116	0	7	0	0	0	52	0	1	0
Lane Group Flow (vph)	0	70	7	213	192	0	62	331	105	0	470	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.2	15.2		67.4	67.4	67.4		67.4	
Effective Green, g (s)		5.9	5.9	15.2	15.2		66.9	66.9	66.9		66.9	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	256	252		589	2368	1059		2212	
v/s Ratio Prot		c0.04		c0.13	0.12			0.09				
v/s Ratio Perm			0.00				0.07		0.07		c0.14	
v/c Ratio		0.65	0.08	0.83	0.76		0.11	0.14	0.10		0.21	
Uniform Delay, d1		46.1	44.5	41.2	40.7		5.9	6.0	5.9		6.4	
Progression Factor		1.00	1.00	1.51	1.53		0.04	0.05	0.00		1.00	
Incremental Delay, d2		12.1	0.3	19.6	12.5		0.3	0.1	0.2		0.2	
Delay (s)		58.2	44.7	81.7	74.7		0.5	0.4	0.2		6.6	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6			78.4			0.3			6.6	
Approach LOS		D			E			A			A	

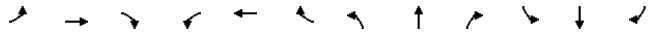
Intersection Summary				
HCM Average Control Delay		27.8	HCM Level of Service	C
HCM Volume to Capacity ratio		0.35		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		48.7%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	106	43	253	242	101	186
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	45	266	255	106	196
RTOR Reduction (vph)	0	32	0	0	0	175
Lane Group Flow (vph)	112	13	266	255	106	21
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	11.3	29.3	14.5	81.7	63.7	11.3
Effective Green, g (s)	10.8	28.8	14.0	81.2	63.2	10.8
Actuated g/C Ratio	0.11	0.29	0.14	0.81	0.63	0.11
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	456	481	1513	1177	171
v/s Ratio Prot	c0.06	0.01	c0.08	c0.14	0.06	0.01
v/s Ratio Perm						
v/c Ratio	0.59	0.03	0.55	0.17	0.09	0.12
Uniform Delay, d1	42.5	25.6	40.1	2.0	7.2	40.3
Progression Factor	0.89	3.10	0.96	0.09	1.00	1.00
Incremental Delay, d2	4.5	0.0	1.4	0.2	0.2	0.3
Delay (s)	42.4	79.4	39.9	0.4	7.3	40.6
Level of Service	D	E	D	A	A	D
Approach Delay (s)	53.0			20.6	29.0	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	26.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1799	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1799	
Volume (vph)	5	21	16	701	79	0	88	91	904	76	241	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	738	83	0	93	96	952	80	254	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	400	421	0	93	96	952	80	318	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.8	2.8	2.8	23.7	23.7		4.7	16.0	62.4	4.4	15.7	
Effective Green, g (s)	2.3	2.3	2.3	23.7	23.7		4.2	16.5	62.4	3.9	16.2	
Actuated g/C Ratio	0.04	0.04	0.04	0.38	0.38		0.07	0.26	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	65	69	58	638	646		119	936	1583	111	467	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	0.18	
v/s Ratio Perm			0.00						c0.60			
v/c Ratio	0.08	0.32	0.01	0.63	0.65		0.78	0.10	0.60	0.72	0.68	
Uniform Delay, d1	29.0	29.3	29.0	15.8	15.9		28.6	17.4	0.0	28.7	20.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.7	2.1		25.7	0.0	1.7	17.6	3.7	
Delay (s)	29.2	30.3	29.0	17.4	18.1		54.4	17.4	1.7	46.3	24.5	
Level of Service	C	C	C	B	B		D	B	A	D	C	
Approach Delay (s)		29.6			17.7			7.3			28.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	14.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	60.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			0.99	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3371	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3371	1441				3433		1583
Volume (vph)	119	216	190	0	691	1074	0	0	0	816	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1131	0	0	0	859	0	136
RTOR Reduction (vph)	0	75	0	0	2	0	0	0	0	0	0	96
Lane Group Flow (vph)	125	352	0	0	753	1103	0	0	0	859	0	40
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.7			39.7	100.0				28.8		28.8
Effective Green, g (s)	19.0	62.7			39.7	100.0				29.3		29.3
Actuated g/C Ratio	0.19	0.63			0.40	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2063			1338	1441				1006		464
v/s Ratio Prot	0.07	0.11			0.22					0.25		
v/s Ratio Perm						c0.77						0.03
v/c Ratio	0.37	0.17			0.56	0.77				0.85		0.09
Uniform Delay, d1	35.3	7.8			23.4	0.0				33.3		25.6
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	2.0				7.1		0.1
Delay (s)	35.6	8.0			16.6	2.0				40.4		25.7
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.2			7.9			0.0			38.4	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1465	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1465	1504			
Volume (vph)	74	957	0	0	1154	357	611	2	1154	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1007	0	0	1215	376	643	2	1215	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	256	0	80	34	0	0	0
Lane Group Flow (vph)	78	1007	0	0	1215	120	560	576	610	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	557	677			
v/s Ratio Prot	0.04	c0.20			c0.26		0.33	c0.39	c0.41			
v/s Ratio Perm						0.08						
v/c Ratio	0.24	0.42			0.82	0.24	0.88	1.03	0.90			
Uniform Delay, d1	35.2	17.5			31.3	25.0	28.8	31.0	25.4			
Progression Factor	0.68	0.48			0.53	0.30	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.5			3.9	0.8	13.1	47.2	15.4			
Delay (s)	25.4	8.9			20.5	8.3	41.9	78.2	40.9			
Level of Service	C	A			C	A	D	E	D			
Approach Delay (s)		10.1			17.6			54.4			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1791	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1791	2628
Volume (vph)	435	1306	370	75	743	98	42	3	42	184	45	732
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	458	1375	389	79	782	103	44	3	44	194	47	771
RTOR Reduction (vph)	0	0	188	0	0	20	0	0	41	0	0	193
Lane Group Flow (vph)	458	1375	201	79	782	83	23	24	3	0	241	578
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		537	1317
v/s Ratio Prot	0.13	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.13	0.22
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.66	0.99	0.27	0.71	0.82	0.20	0.20	0.21	0.03		0.45	0.44
Uniform Delay, d1	36.8	29.5	13.6	45.9	34.2	28.1	43.9	44.0	43.4		28.3	16.0
Progression Factor	1.15	0.58	0.43	1.00	1.00	1.00	1.00	1.00	1.00		1.22	0.96
Incremental Delay, d2	3.4	18.6	0.1	15.2	7.7	1.0	0.6	0.6	0.1		2.5	1.0
Delay (s)	45.7	35.8	5.9	61.1	41.9	29.1	44.6	44.6	43.5		37.0	16.2
Level of Service	D	D	A	E	D	C	D	D	D		D	B
Approach Delay (s)		32.6			42.1			44.1			21.2	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	32.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	257	0	0	0	0	500	9	0	149	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	526	9	0	157	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	534	0	0	157	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.6					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.15			0.08	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.23			0.15	
Uniform Delay, d1	26.8	26.8	21.2					7.4			10.6	
Progression Factor	0.96	0.96	0.77					1.00			0.95	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.3	
Delay (s)	25.9	25.7	16.3					7.7			10.4	
Level of Service	C	C	B					A			B	
Approach Delay (s)		18.6			0.0			7.7			10.4	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.20			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	24.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3337		1770	3480		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3337		1770	3480		1770	1832		1770	1863	1583
Volume (vph)	393	449	277	36	481	61	254	210	26	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	473	292	38	506	64	267	221	27	29	212	108
RTOR Reduction (vph)	0	76	0	0	10	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	689	0	38	560	0	267	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	27.5	44.3		5.7	22.5		19.0	19.0		16.0	16.0	16.0
Effective Green, g (s)	27.0	44.8		5.2	23.0		18.5	18.5		15.5	15.5	15.5
Actuated g/C Ratio	0.27	0.45		0.05	0.23		0.18	0.18		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	478	1495		92	800		327	339		274	289	245
v/s Ratio Prot	c0.23	0.21		0.02	c0.16		c0.15	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.87	0.46		0.41	0.70		0.82	0.72		0.11	0.73	0.07
Uniform Delay, d1	34.8	19.2		45.9	35.3		39.1	38.3		36.3	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.97	0.97		0.81	0.85	1.27
Incremental Delay, d2	15.1	1.0		3.0	5.1		14.5	7.1		0.2	9.0	0.1
Delay (s)	49.9	20.2		48.9	40.4		52.5	44.2		29.5	43.3	45.8
Level of Service	D	C		D	D		D	D		C	D	D
Approach Delay (s)		30.6			40.9			48.5			42.9	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM Average Control Delay	38.1	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	75.0%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3374		1770	3513		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3374		1770	3513		1770	3487		1770	3497	
Volume (vph)	94	267	121	100	423	22	127	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	281	127	105	445	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	56	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	352	0	105	464	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	17.9		9.3	19.3		12.6	50.6		7.2	45.2	
Effective Green, g (s)	6.9	18.4		8.3	19.8		11.6	51.1		6.2	45.7	
Actuated g/C Ratio	0.07	0.18		0.08	0.20		0.12	0.51		0.06	0.46	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	621		147	696		205	1782		110	1598	
v/s Ratio Prot	0.06	0.10		c0.06	c0.13		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.57		0.71	0.67		0.65	0.35		0.47	0.54	
Uniform Delay, d1	45.9	37.2		44.7	37.1		42.3	14.6		45.3	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.2		15.2	2.4		7.3	0.5		3.2	1.3	
Delay (s)	78.0	38.4		59.9	39.5		49.6	15.1		48.5	20.9	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		46.1			43.2			21.1			22.5	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	30.7	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.59				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	61.2%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3410		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3410		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	278	89	43	352	177	82	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	293	94	45	371	186	86	165	32	26	53	9
RTOR Reduction (vph)	0	19	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	368	0	45	371	101	86	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		5.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1773		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	c0.11		c0.03	0.10		0.05	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.21		0.53	0.19	0.12	0.34	0.73			0.35	
Uniform Delay, d1	48.1	12.9		46.5	11.7	11.2	38.7	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.0	0.3		4.5	0.2	0.3	0.6	9.6			0.7	
Delay (s)	58.1	13.2		51.0	11.9	11.5	39.3	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		15.9			14.7			47.2			40.3	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	23.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.33				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	46.4%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3432		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3432		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	66	52	527	187	137	255	39	131	185	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	69	55	555	197	144	268	41	138	195	11
RTOR Reduction (vph)	0	18	0	0	0	100	0	0	32	0	2	0
Lane Group Flow (vph)	29	323	0	55	555	97	144	268	9	138	204	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.5		7.0	49.0	49.0	12.3	23.5	23.5	8.5	19.7	
Effective Green, g (s)	4.0	46.5		6.5	49.0	49.0	11.8	23.0	23.0	8.0	19.2	
Actuated g/C Ratio	0.04	0.46		0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1596		115	1734	776	209	428	364	142	355	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		0.08	c0.14		c0.08	0.11	
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.12	0.69	0.63	0.03	0.97	0.57	
Uniform Delay, d1	46.8	15.8		45.1	15.4	13.8	42.3	34.6	29.8	45.9	36.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.83	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.3	8.4	2.5	0.0	65.5	1.8	
Delay (s)	49.6	16.1		47.4	15.9	14.2	50.7	37.1	29.8	113.1	32.2	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		18.7			17.6			40.8			64.7	
Approach LOS		B			B			D			E	

Intersection Summary					
HCM Average Control Delay	31.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	52.7%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	386	16	90	745	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	406	17	95	784	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	806			423			1049	1461	212	1323	1458	403
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	806			423			1049	1461	212	1323	1458	403
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			83	88	90	98	97	100
cM capacity (veh/h)	814			1133			162	113	794	86	114	597

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	271	152	95	523	284	34	85	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	814	1700	1700	1133	1700	1700	149	535	117
Volume to Capacity	0.03	0.16	0.09	0.08	0.31	0.17	0.23	0.16	0.05
Queue Length 95th (ft)	2	0	0	7	0	0	21	14	4
Control Delay (s)	9.6	0.0	0.0	8.5	0.0	0.0	36.1	13.0	37.6
Lane LOS	A			A			E	B	E
Approach Delay (s)	0.5			0.9			19.6		37.6
Approach LOS							C		E

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	38.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3472		1770	3498			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3472		1770	3498			1805	1583		1545	
Volume (vph)	3	396	57	122	626	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	417	60	128	659	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	469	0	128	711	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1701		191	2078			310	272		108	
v/s Ratio Prot	0.00	c0.14		c0.07	c0.20			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.28		0.67	0.34			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.0		42.9	10.3			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.3	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.4		54.2	7.4			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.8			14.5			46.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3361		1770	3386		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3361		1770	3386		3433	3534		1770	3508	
Volume (vph)	92	288	145	32	442	179	299	785	8	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	303	153	34	465	188	315	826	8	168	917	57
RTOR Reduction (vph)	0	70	0	0	44	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	386	0	34	609	0	315	833	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	21.9		8.3	21.7		15.0	43.5		13.3	41.8	
Effective Green, g (s)	7.5	20.9		7.3	20.7		14.0	43.5		12.3	41.8	
Actuated g/C Ratio	0.08	0.21		0.07	0.21		0.14	0.44		0.12	0.42	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	702		129	701		481	1537		218	1466	
v/s Ratio Prot	c0.05	0.11		0.02	c0.18		c0.09	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.55		0.26	0.87		0.65	0.54		0.77	0.66	
Uniform Delay, d1	45.3	35.3		43.8	38.3		40.7	20.9		42.5	23.4	
Progression Factor	1.31	1.03		1.14	1.09		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.7		0.4	10.4		2.4	1.4		14.2	2.4	
Delay (s)	74.7	37.2		50.2	52.2		43.2	22.3		56.6	25.8	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.8			52.1			28.0			30.3	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	35.9	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	70.7%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3501		1770	3496			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3501		1770	3496			3172			2914	
Volume (vph)	50	385	29	78	561	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	405	31	82	591	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	426	0	82	633	0	0	195	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.8	25.9		3.9	27.0			9.2			9.2	
Effective Green, g (s)	2.3	25.9		3.4	27.0			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	81	1814		120	1888			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.18							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.65	0.23		0.68	0.34			0.35			0.71	
Uniform Delay, d1	23.5	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.73	1.30		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.2	0.3		12.1	0.5			0.4			4.7	
Delay (s)	29.4	8.9		34.8	6.9			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		11.1			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	14.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	51.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	238	57	2	8	78	26	2	1	2	16	4	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	251	60	2	8	82	27	2	1	2	17	4	160

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	251	62	118	5	181
Volume Left (vph)	251	0	8	2	17
Volume Right (vph)	0	2	27	2	160
Hadj (s)	0.53	0.01	-0.09	-0.13	-0.48
Departure Headway (s)	5.6	5.1	4.8	5.1	4.5
Degree Utilization, x	0.39	0.09	0.16	0.01	0.23
Capacity (veh/h)	620	684	715	632	739
Control Delay (s)	10.9	7.4	8.6	8.2	8.8
Approach Delay (s)	10.2		8.6	8.2	8.8
Approach LOS	B		A	A	A

Intersection Summary				
Delay	9.5			
HCM Level of Service	A			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary					
HCM Average Control Delay	14.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	56.6	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	49.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3504			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3504			3490	
Volume (vph)	60	193	12	111	256	20	0	1006	72	0	955	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1059	76	0	1005	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1131	0	0	1100	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.32			0.32	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.54			0.53	
Uniform Delay, d1		43.9			42.1			12.8			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.0			1.0	
Delay (s)		52.4			46.5			13.8			13.6	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.8			13.6	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	21.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3260			5076	
Volume (vph)	0	0	0	65	461	718	12	511	0	0	1000	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	538	0	0	1053	13
RTOR Reduction (vph)	0	0	0	0	0	196	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	560	0	551	0	0	1065	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					36.1	36.1		54.9			54.9	
Effective Green, g (s)					36.1	36.1		55.9			55.9	
Actuated g/C Ratio					0.36	0.36		0.56			0.56	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1270	571		1822			2837	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.35		0.17				
v/c Ratio					0.44	0.98		0.30			0.38	
Uniform Delay, d1					24.2	31.6		11.7			12.3	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	32.5		0.4			0.4	
Delay (s)					24.3	64.1		12.1			12.7	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			47.3			12.1			12.7	
Approach LOS		A			D			B			B	

Intersection Summary				
HCM Average Control Delay	28.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3488		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3488		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	505	54	434	598	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	532	57	457	629	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	581	0	457	629	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	48.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		661						1604		613	2462	
v/s Ratio Prot		c0.13						c0.17		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.36		0.75	0.26	
Uniform Delay, d1		26.3						12.2		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.6		4.3	0.0	
Delay (s)		28.4						12.9		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			12.9			15.6	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3425		1770	3503		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3425		1770	3503		1770	3421		1770	1863	1583
Volume (vph)	290	760	208	139	862	64	186	450	129	139	315	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	219	146	907	67	196	474	136	146	332	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	24	0	0	0	305
Lane Group Flow (vph)	305	997	0	146	969	0	196	586	0	146	332	204
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.1		12.6	30.6		20.0	20.0		21.3	21.3	21.3
Effective Green, g (s)	21.1	40.1		12.6	31.6		20.0	20.0		21.3	21.3	21.3
Actuated g/C Ratio	0.19	0.36		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1249		203	1006		322	622		343	361	307
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.11	c0.17		0.08	c0.18	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.80		0.72	0.96		0.61	0.94		0.43	0.92	0.67
Uniform Delay, d1	43.4	31.3		47.0	38.6		41.4	44.4		39.0	43.5	41.0
Progression Factor	1.00	1.00		1.18	0.94		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.4		2.9	7.6		2.1	19.0		0.9	27.7	5.4
Delay (s)	68.2	36.7		58.5	44.0		43.6	64.0		39.8	71.2	46.4
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		43.9			45.9			59.0			53.8	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	49.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3436		1770	3491		1770	3450	
Flt Permitted	0.18	1.00			0.67		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	341	3385			2310		1770	3491		1770	3450	
Volume (vph)	198	635	260	74	665	148	270	1085	109	186	997	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	78	700	156	284	1142	115	196	1049	213
RTOR Reduction (vph)	0	41	0	0	15	0	0	7	0	0	15	0
Lane Group Flow (vph)	208	901	0	0	919	0	284	1250	0	196	1247	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	149	1477			1008		274	1111		241	1035	
v/s Ratio Prot		0.27					0.16	c0.36		0.11	c0.36	
v/s Ratio Perm	c0.61				0.40							
v/c Ratio	1.40	0.61			0.91		1.04	1.13		0.81	1.20	
Uniform Delay, d1	31.0	23.8			29.0		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	203.4	0.5			12.1		64.2	68.4		18.5	101.3	
Delay (s)	237.4	26.7			41.1		110.7	105.9		64.7	139.8	
Level of Service	F	C			D		F	F		E	F	
Approach Delay (s)		64.8			41.1			106.8			129.7	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	91.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	113.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	178	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	187	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			342	341	20	529	341	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	529	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	82	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	351	526	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	168	191	2
Volume Left	1	151	2	1
Volume Right	0	0	187	0
cSH	1599	1596	1042	421
Volume to Capacity	0.00	0.09	0.18	0.01
Queue Length 95th (ft)	0	8	17	0
Control Delay (s)	0.4	6.8	9.2	13.6
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.2	13.6
Approach LOS			A	B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 3 PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	138	79	6	208	106	227	10	444	268	89	346	66	419	16	33	427	114	20

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	223	541	722	501	435	460	134
Delay	53.2	0.7	62.3	34.4	1.2	77.2	57.7
LOS	D	A	E	C	A	E	E

HCM Average Control Delay	**57.5**
HCM Level of Service	**E**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.90			1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1672			1861	1583	1770	1818	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1672			1839	1583	1770	1818	
Volume (vph)	138	79	6	208	106	227	10	444	268	89	346	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	145	83	6	219	112	239	11	467	282	94	364	69
RTOR Reduction (vph)	0	2	0	0	61	0	0	0	181	0	6	0
Lane Group Flow (vph)	145	87	0	219	290	0	0	478	101	94	427	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	13.7	13.7		44.9	44.9			30.2	30.2	9.9	44.1	
Effective Green, g (s)	13.7	13.7		44.9	44.9			30.2	30.2	9.9	44.1	
Actuated g/C Ratio	0.12	0.12		0.39	0.39			0.26	0.26	0.09	0.38	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	211	220		693	655			484	417	153	699	
v/s Ratio Prot	c0.08	0.05		0.12	c0.17					0.05	c0.24	
v/s Ratio Perm								c0.26	0.06			
v/c Ratio	0.69	0.40		0.32	0.44			0.99	0.24	0.61	0.61	
Uniform Delay, d1	48.4	46.7		24.2	25.7			42.1	33.2	50.6	28.4	
Progression Factor	1.00	1.00		0.06	0.01			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.2	0.9		0.0	0.1			37.3	0.2	5.1	1.4	
Delay (s)	56.7	47.5		1.4	0.3			79.4	33.5	55.6	29.8	
Level of Service	E	D		A	A			E	C	E	C	
Approach Delay (s)		53.2			0.7			62.3			34.4	
Approach LOS		D			A			E			C	

Intersection Summary				
HCM Average Control Delay	37.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	114.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1853		1770	1863	1751	
Flt Permitted	1.00		0.14	1.00	0.96	
Satd. Flow (perm)	1853		264	1863	1751	
Volume (vph)	419	16	33	427	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	441	17	35	449	120	21
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	457	0	35	449	136	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	94.0		28.2	28.2	12.7	
Effective Green, g (s)	94.0		28.2	28.2	12.7	
Actuated g/C Ratio	0.82		0.25	0.25	0.11	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1519		65	458	194	
v/s Ratio Prot	c0.25			c0.24	c0.08	
v/s Ratio Perm			0.13			
v/c Ratio	0.30		0.54	0.98	0.70	
Uniform Delay, d1	2.5		37.6	43.0	49.2	
Progression Factor	0.44		1.00	1.00	1.00	
Incremental Delay, d2	0.1		6.5	36.8	8.6	
Delay (s)	1.2		44.1	79.8	57.7	
Level of Service	A		D	E	E	
Approach Delay (s)	1.2			77.2	57.7	
Approach LOS	A			E	E	

Intersection Summary				
HCM Average Control Delay	42.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	114.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1776			1811		1770	1842		1770	1738	
Flt Permitted		0.78			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1413			1593		1770	1842		1770	1738	
Volume (vph)	181	228	68	36	136	20	163	657	44	19	354	204
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	240	72	38	143	21	172	692	46	20	373	215
RTOR Reduction (vph)	0	11	0	0	8	0	0	4	0	0	37	0
Lane Group Flow (vph)	0	492	0	0	194	0	172	734	0	20	551	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		411			463		222	874		29	635	
v/s Ratio Prot							c0.10	c0.40		0.01	0.32	
v/s Ratio Perm		c0.35			0.12							
v/c Ratio		1.20			0.42		0.77	0.84		0.69	0.87	
Uniform Delay, d1		19.5			15.7		23.3	12.6		26.9	16.2	
Progression Factor		1.00			1.00		0.91	1.06		0.98	1.06	
Incremental Delay, d2		110.5			0.4		13.1	8.4		41.2	12.7	
Delay (s)		130.0			16.2		34.3	21.8		67.5	29.9	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		130.0			16.2			24.1			31.2	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	49.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	182	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	192	71	5	146	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	119	280	153
Volume Left (vph)	4	107	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.10	0.04
Departure Headway (s)	4.7	5.2	4.5	4.8
Degree Utilization, x	0.11	0.17	0.35	0.20
Capacity (veh/h)	685	632	764	705
Control Delay (s)	8.2	9.3	9.9	9.0
Approach Delay (s)	8.2	9.3	9.9	9.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	97	42	28	615	428	135
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	44	29	647	451	142
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.99	0.99	0.99			
vC, conflicting volume	1228	522	593			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1231	515	587			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	92	97			
cM capacity (veh/h)	187	552	974			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	146	29	647	593
Volume Left	102	29	0	0
Volume Right	44	0	0	142
cSH	234	974	1700	1700
Volume to Capacity	0.63	0.03	0.38	0.35
Queue Length 95th (ft)	93	2	0	0
Control Delay (s)	43.1	8.8	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	43.1	0.4		0.0
Approach LOS	E			

Intersection Summary			
Average Delay		4.6	
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1650		1770	3539	1452		3480	
Flt Permitted		0.97	1.00	0.95	0.97		0.28	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1650		525	3539	1452		3227	
Volume (vph)	12	5	95	582	63	53	137	489	240	22	550	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	613	66	56	144	515	253	23	579	63
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	156	0	7	0
Lane Group Flow (vph)	0	18	6	377	352	0	144	515	97	0	658	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	741		201	1358	557		1238	
v/s Ratio Prot		c0.01		c0.22	0.21			0.15				
v/s Ratio Perm			0.00				c0.27		0.07		0.20	
v/c Ratio		0.17	0.06	0.50	0.47		0.72	0.38	0.17		0.53	
Uniform Delay, d1		49.3	49.0	21.5	21.2		28.8	24.5	22.4		26.2	
Progression Factor		1.00	1.00	0.25	0.23		1.17	0.83	1.53		1.00	
Incremental Delay, d2		0.6	0.2	2.2	2.0		5.9	0.2	0.2		1.6	
Delay (s)		49.8	49.2	7.6	6.9		39.5	20.5	34.5		27.9	
Level of Service		D	D	A	A		D	C	C		C	
Approach Delay (s)		49.3			7.2			27.4			27.9	
Approach LOS		D			A			C			C	

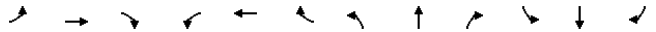
Intersection Summary					
HCM Average Control Delay	22.5	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.57				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	223	37	447	716	240	252
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	39	471	754	253	265
RTOR Reduction (vph)	0	22	0	0	0	130
Lane Group Flow (vph)	235	17	471	754	253	135
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.8	47.7	24.4	83.2	55.3	19.8
Effective Green, g (s)	19.3	47.2	23.9	82.7	54.8	19.3
Actuated g/C Ratio	0.18	0.43	0.22	0.75	0.50	0.18
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	311	679	746	1401	928	278
v/s Ratio Prot	c0.13	0.01	c0.14	c0.40	0.14	0.09
v/s Ratio Perm						
v/c Ratio	0.76	0.02	0.63	0.54	0.27	0.48
Uniform Delay, d1	43.1	18.1	39.1	5.7	16.0	40.9
Progression Factor	0.61	0.15	0.97	0.18	1.00	1.00
Incremental Delay, d2	9.5	0.0	1.5	1.3	0.7	1.3
Delay (s)	35.7	2.8	39.4	2.3	16.8	42.2
Level of Service	D	A	D	A	B	D
Approach Delay (s)	31.1			16.5	29.8	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	21.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1828	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1828	
Volume (vph)	172	370	60	678	14	0	11	696	1394	269	566	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	714	15	0	12	733	1467	283	596	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	357	372	0	12	733	1467	283	643	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.2	16.2	16.2	22.8	22.8		1.2	23.8	96.2	17.9	40.5	
Effective Green, g (s)	15.7	15.7	15.7	22.8	22.8		0.7	24.3	96.2	17.4	41.0	
Actuated g/C Ratio	0.16	0.16	0.16	0.24	0.24		0.01	0.25	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	289	304	258	398	400		13	894	1583	320	779	
v/s Ratio Prot	0.10	c0.21		0.21	0.22		0.01	0.21		0.16	0.35	
v/s Ratio Perm			0.03						c0.93			
v/c Ratio	0.63	1.28	0.18	0.90	0.93		0.92	0.82	0.93	0.88	0.83	
Uniform Delay, d1	37.5	40.2	34.7	35.6	35.9		47.7	33.9	0.0	38.4	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.0	148.7	0.1	22.0	28.1		205.3	5.8	10.8	23.3	7.0	
Delay (s)	40.6	189.0	34.8	57.5	64.0		253.0	39.7	10.8	61.7	31.4	
Level of Service	D	F	C	E	E		F	D	B	E	C	
Approach Delay (s)		131.2			60.8			21.7			40.6	
Approach LOS		F			E			C			D	

Intersection Summary				
HCM Average Control Delay	47.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	96.2	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	89.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2944	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2944	1399				3433		1583
Volume (vph)	140	403	575	0	522	1860	0	0	0	1016	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	1958	0	0	0	1069	0	347
RTOR Reduction (vph)	0	234	0	0	226	0	0	0	0	0	0	178
Lane Group Flow (vph)	147	795	0	0	1080	1201	0	0	0	1069	0	169
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	66.3			42.3	110.0				35.2		35.2
Effective Green, g (s)	20.0	66.3			42.3	110.0				35.7		35.7
Actuated g/C Ratio	0.18	0.60			0.38	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1945			1132	1399				1114		514
v/s Ratio Prot	0.08	0.25			c0.37							0.11
v/s Ratio Perm						c0.86				c0.31		
v/c Ratio	0.46	0.41			1.00dr	0.86				0.96		0.33
Uniform Delay, d1	40.2	11.5			32.9	0.0				36.4		28.1
Progression Factor	1.00	1.00			0.74	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			2.6	0.7				17.8		0.3
Delay (s)	40.5	12.2			27.0	0.7				54.3		28.4
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.7			14.4			0.0			47.9	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1514	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1514	659			
Volume (vph)	142	1276	0	0	1812	425	571	226	1119	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1343	0	0	1907	447	601	238	1178	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	270	0	81	6	0	0	0
Lane Group Flow (vph)	149	1343	0	0	1907	177	601	746	583	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	509	335			
v/s Ratio Prot	0.08	c0.38			c0.41		0.36	0.49	c0.88			
v/s Ratio Perm						0.13						
v/c Ratio	0.44	0.90			1.13	0.36	1.06	1.47	1.74			
Uniform Delay, d1	39.3	29.9			35.0	25.6	36.5	36.5	27.0			
Progression Factor	1.56	0.36			0.92	1.33	1.00	1.00	1.00			
Incremental Delay, d2	2.3	5.5			62.3	0.9	55.9	220.2	344.8			
Delay (s)	63.5	16.2			94.4	35.0	92.4	256.7	371.8			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		20.9			83.1			241.4			0.0	
Approach LOS		C			F			F			A	

Intersection Summary				
HCM Average Control Delay	121.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			

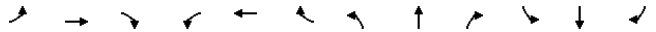
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1808	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1808	2628
Volume (vph)	595	1021	779	325	1174	282	132	16	66	255	163	824
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	626	1075	820	342	1236	297	139	17	69	268	172	867
RTOR Reduction (vph)	0	3	136	0	0	33	0	0	60	0	0	86
Lane Group Flow (vph)	626	1120	636	342	1236	264	76	80	9	0	440	781
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.18	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.24	0.30
v/s Ratio Perm						0.17			0.01			
v/c Ratio	1.18	1.11	1.13	1.25	1.16	0.56	0.36	0.37	0.04		0.89	0.70
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	32.3	43.9	44.0	42.1		38.4	25.7
Progression Factor	1.21	1.05	1.13	1.06	1.07	1.13	1.02	1.03	2.10		1.04	0.74
Incremental Delay, d2	82.5	51.2	59.2	133.0	82.0	3.6	0.7	0.7	0.1		19.1	3.1
Delay (s)	139.0	91.5	92.4	182.4	123.2	40.2	45.6	45.8	88.7		58.9	22.1
Level of Service	F	F	F	F	F	D	D	D	F		E	C
Approach Delay (s)		103.6			120.8			58.9			34.5	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	92.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3526			1863	
Volume (vph)	121	156	824	0	0	0	0	1140	25	0	277	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1200	26	0	292	0
RTOR Reduction (vph)	0	0	213	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	197	654	0	0	0	0	1225	0	0	292	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.23					c0.35			0.16	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.39					0.59			0.48	
Uniform Delay, d1	25.4	25.4	11.5					14.4			29.5	
Progression Factor	1.26	1.24	1.96					1.00			1.29	
Incremental Delay, d2	0.6	0.3	0.1					1.3			2.6	
Delay (s)	32.6	31.8	22.6					15.7			40.7	
Level of Service	C	C	C					B			D	
Approach Delay (s)		25.0			0.0			15.7			40.7	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3371		1770	3479		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3371		1770	3479		1770	1846		1770	1863	1539
Volume (vph)	190	794	251	20	712	56	525	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	836	264	21	749	59	553	537	28	72	256	160
RTOR Reduction (vph)	0	26	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1074	0	21	802	0	553	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	947		34	727		677	707		304	320	264
v/s Ratio Prot	0.11	c0.32		0.01	c0.23		c0.31	0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.13		0.62	1.10		0.82	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.6		53.6	43.5		30.5	30.2		39.3	43.7	38.4
Progression Factor	1.27	0.92		1.00	1.00		1.01	1.01		1.23	1.18	2.49
Incremental Delay, d2	147.7	72.6		29.0	65.5		7.3	6.0		0.4	12.3	0.2
Delay (s)	211.3	108.8		82.5	109.0		38.0	36.5		48.8	64.1	95.7
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		124.6			108.3			37.2			72.2	
Approach LOS		F			F			D			E	

Intersection Summary				
HCM Average Control Delay	88.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	89.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3480		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3418		1770	3480		1770	3491		1770	3477	
Volume (vph)	151	656	194	102	480	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	691	204	107	505	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	30	0	0	11	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	865	0	107	558	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.9		8.3	22.5		12.9	31.9		9.9	28.9	
Effective Green, g (s)	9.7	25.4		7.3	23.0		11.9	32.4		8.9	29.4	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	965		144	889		234	1257		175	1136	
v/s Ratio Prot	c0.09	c0.25		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.90		0.74	0.63		0.80	1.11		0.67	1.10	
Uniform Delay, d1	39.4	31.0		40.4	29.7		37.9	28.8		39.2	30.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	10.8		18.6	1.4		17.8	62.7		9.8	57.0	
Delay (s)	64.8	41.8		59.0	31.1		55.7	91.5		49.0	87.3	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		45.3			35.5			87.3			84.0	
Approach LOS		D			D			F			F	

Intersection Summary				
HCM Average Control Delay	69.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1018: 40th St & Horton St

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3384		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3384		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	667	225	80	682	55	249	132	124	96	182	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	702	237	84	718	58	262	139	131	101	192	20
RTOR Reduction (vph)	0	27	0	0	0	34	0	37	0	0	2	0
Lane Group Flow (vph)	27	912	0	84	718	24	262	233	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	37.8		7.6	41.2	41.2	19.1	19.1			21.0	
Effective Green, g (s)	3.7	37.8		7.1	41.2	41.2	18.6	18.6			20.5	
Actuated g/C Ratio	0.04	0.38		0.07	0.41	0.41	0.19	0.19			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1279		126	1458	627	329	315			372	
v/s Ratio Prot	0.02	c0.27		c0.05	c0.20		c0.15	0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.71		0.67	0.49	0.04	0.80	0.74			0.83	
Uniform Delay, d1	47.1	26.5		45.3	21.7	17.6	38.9	38.4			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	3.4		11.4	1.2	0.1	12.2	8.3			14.6	
Delay (s)	50.2	29.9		56.7	22.9	17.7	51.1	46.7			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		30.5			25.8			48.8			52.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	35.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1019: 40th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3539	1495	1770	1863	1520	1770	1824	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3431		1770	3539	1495	1770	1863	1520	1770	1824	
Volume (vph)	46	674	135	141	583	232	218	326	133	261	428	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	142	148	614	244	229	343	140	275	451	54
RTOR Reduction (vph)	0	16	0	0	0	149	0	0	100	0	4	0
Lane Group Flow (vph)	48	835	0	148	614	95	229	343	40	275	501	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.2		11.9	38.8	38.8	12.5	28.9	28.9	12.5	28.9	
Effective Green, g (s)	4.8	32.2		11.4	38.8	38.8	12.0	28.4	28.4	12.0	28.4	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.28	0.28	0.12	0.28	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1105		202	1373	580	212	529	432	212	518	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.13	0.18		c0.16	c0.27	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.76		0.73	0.45	0.16	1.08	0.65	0.09	1.30	0.97	
Uniform Delay, d1	46.6	30.4		42.8	22.7	20.0	44.0	31.4	26.3	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.95	
Incremental Delay, d2	6.8	4.8		12.2	1.1	0.6	84.8	2.4	0.1	160.8	28.5	
Delay (s)	53.4	35.2		55.0	23.7	20.6	128.8	33.8	26.4	203.7	61.9	
Level of Service	D	D		D	C	C	F	C	C	F	E	
Approach Delay (s)		36.2			27.6			62.9			111.9	
Approach LOS		D			C			E			F	

Intersection Summary				
HCM Average Control Delay	56.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	992	44	96	954	12	33	12	98	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1044	46	101	1004	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1017			1091			1832	2333	545	1891	2349	508
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1017			1091			1832	2333	545	1891	2349	508
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	57	79	100	71	98
cM capacity (veh/h)	678			636			31	30	482	19	29	510

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	696	394	101	669	347	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	678	1700	1700	636	1700	1700	31	256	58
Volume to Capacity	0.03	0.41	0.23	0.16	0.39	0.20	1.33	0.43	0.31
Queue Length 95th (ft)	3	0	0	14	0	0	115	50	28
Control Delay (s)	10.5	0.0	0.0	11.7	0.0	0.0	470.9	29.2	93.5
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			149.7		93.5
Approach LOS							F		F

Intersection Summary				
Average Delay	10.7			
Intersection Capacity Utilization	52.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3429		1770	3490			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3429		1770	3490			1809	1555		1813	
Volume (vph)	30	942	159	158	871	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	992	167	166	917	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1147	0	166	973	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1221		221	1393			385	331		265	
v/s Ratio Prot	0.02	c0.33		0.09	c0.28			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.94		0.75	0.70			0.87	0.27		0.71	
Uniform Delay, d1	42.9	31.2		42.2	25.0			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	14.9		1.3	0.3			18.9	0.3		8.2	
Delay (s)	43.5	46.0		50.7	15.7			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		45.9			20.8			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	37.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3296		1770	3374		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3296		1770	3374		3433	3531		1770	3479	
Volume (vph)	207	678	374	47	494	180	495	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	714	394	49	520	189	521	1266	16	281	1236	107
RTOR Reduction (vph)	0	74	0	0	37	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1034	0	49	672	0	521	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	936		81	641		446	1285		258	1322	
v/s Ratio Prot	c0.12	c0.31		0.03	0.20		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.10		0.60	1.05		1.17	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.86		1.01	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.4	56.2		7.8	47.4		97.4	24.4		81.9	27.5	
Delay (s)	41.9	86.8		55.3	85.5		140.9	56.2		124.6	58.5	
Level of Service	D	F		E	F		F	E		F	E	
Approach Delay (s)		79.4			83.6			80.7			70.0	
Approach LOS		E			F			F			E	

Intersection Summary				
HCM Average Control Delay	77.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	98.2%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3452			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3452			3117			2416	
Volume (vph)	22	821	17	45	579	97	19	292	107	81	229	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	864	18	47	609	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	20	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	880	0	47	691	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1906			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.48		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.6		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.24		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.0	9.5		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.3			8.2			20.5			28.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	379	89	11	86	103	46	19	83	50	65	59	309
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	399	94	12	91	108	48	20	87	53	68	62	325

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	399	105	247	160	456
Volume Left (vph)	399	0	91	20	68
Volume Right (vph)	0	12	48	53	325
Hadj (s)	0.53	-0.04	-0.01	-0.14	-0.36
Departure Headway (s)	7.9	7.3	7.5	7.7	6.6
Degree Utilization, x	0.87	0.21	0.52	0.34	0.83
Capacity (veh/h)	446	481	429	415	523
Control Delay (s)	43.8	11.1	18.3	14.7	34.0
Approach Delay (s)	37.0		18.3	14.7	34.0
Approach LOS	E		C	B	D

Intersection Summary				
Delay	30.0			
HCM Level of Service	D			
Intersection Capacity Utilization	80.3%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery Street

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.96	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.5			12.4			10.5	
Approach LOS		C			C			B			B	

Intersection Summary						
HCM Average Control Delay	17.9	HCM Level of Service		B		
HCM Volume to Capacity ratio	0.68					
Actuated Cycle Length (s)	63.3	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	82.1%	ICU Level of Service		E		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	332	32	121	216	36	0	1443	92	0	1500	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1519	97	0	1579	106
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1612	0	0	1681	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.82			0.85	
Uniform Delay, d1		43.5			42.5			18.6			19.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.9			4.9	
Delay (s)		109.8			47.1			22.5			24.3	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.5			24.3	
Approach LOS		F			D			C			C	

Intersection Summary				
HCM Average Control Delay	36.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.77			1.00	
Satd. Flow (perm)					3514	1583		2714			5075	
Volume (vph)	0	0	0	64	385	732	49	1004	0	0	1519	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1057	0	0	1599	22
RTOR Reduction (vph)	0	0	0	0	0	78	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	693	0	1109	0	0	1619	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1659			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.41				
v/c Ratio					0.45	1.46		0.67			0.52	
Uniform Delay, d1					25.5	31.5		11.5			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	218.2		2.2			0.6	
Delay (s)					25.6	249.7		13.7			10.6	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			164.6			13.7			10.6	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	59.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3500		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3500		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	971	78	749	870	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1022	82	788	916	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1099	0	788	916	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1324		889	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.83		0.89	0.38	
Uniform Delay, d1		40.4						31.0		39.2	7.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						6.1		10.3	0.0	
Delay (s)		60.4						37.1		49.5	7.9	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			37.1			27.2	
Approach LOS		E			A			D			C	

Intersection Summary				
HCM Average Control Delay	37.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	105	12	1	0	3	192	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	209	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	465	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	465	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	80	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1067	384	603	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	212	12
Volume Left	0	114	0	1
Volume Right	0	1	209	3
cSH	1604	1605	1055	646
Volume to Capacity	0.00	0.07	0.20	0.02
Queue Length 95th (ft)	0	6	19	1
Control Delay (s)	0.0	6.7	9.3	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.3	10.7
Approach LOS			A	B

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 3 Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	127	46	13	225	67	91	13	457	300	83	555	39	155	23	39	169	60	13

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	186	383	770	677	178	208	73
Delay	44.0	8.2	40.3	31.5	0.7	38.8	44.3
LOS	D	A	D	C	A	D	D

HCM Average Control Delay	**37.5**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.91			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1702			1860	1583	1770	1845	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1702			1822	1583	1770	1845	
Volume (vph)	127	46	13	225	67	91	13	457	300	83	555	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	50	14	245	73	99	14	497	326	90	603	42
RTOR Reduction (vph)	0	9	0	0	43	0	0	0	183	0	2	0
Lane Group Flow (vph)	138	55	0	245	129	0	0	511	143	90	643	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	12.5	12.5		31.4	31.4			31.2	31.2	8.6	43.8	
Effective Green, g (s)	12.5	12.5		31.4	31.4			31.2	31.2	8.6	43.8	
Actuated g/C Ratio	0.13	0.13		0.31	0.31			0.31	0.31	0.09	0.44	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	222	226		557	536			570	495	153	811	
v/s Ratio Prot	c0.08	0.03		c0.14	0.08					0.05	c0.35	
v/s Ratio Perm								c0.28	0.09			
v/c Ratio	0.62	0.24		0.44	0.24			0.90	0.29	0.59	0.79	
Uniform Delay, d1	41.4	39.3		27.2	25.3			32.7	25.9	43.8	24.1	
Progression Factor	1.00	1.00		0.40	0.15			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.6	0.4		0.2	0.1			16.6	0.2	3.7	5.2	
Delay (s)	46.0	39.8		11.2	4.0			49.3	26.1	47.5	29.2	
Level of Service	D	D		B	A			D	C	D	C	
Approach Delay (s)		44.0			8.2			40.3			31.5	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	31.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	99.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Alt#3 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1830		1770	1863	1746	
Flt Permitted	1.00		0.21	1.00	0.96	
Satd. Flow (perm)	1830		396	1863	1746	
Volume (vph)	155	23	39	169	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	25	42	184	65	14
RTOR Reduction (vph)	3	0	0	0	6	0
Lane Group Flow (vph)	190	0	42	184	73	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	83.1		18.8	18.8	8.6	
Effective Green, g (s)	83.1		18.8	18.8	8.6	
Actuated g/C Ratio	0.83		0.19	0.19	0.09	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1525		75	351	151	
v/s Ratio Prot	c0.10			0.10	c0.04	
v/s Ratio Perm			c0.11			
v/c Ratio	0.12		0.56	0.52	0.48	
Uniform Delay, d1	1.5		36.7	36.4	43.4	
Progression Factor	0.45		1.00	1.00	1.00	
Incremental Delay, d2	0.0		7.5	1.1	0.9	
Delay (s)	0.7		44.2	37.5	44.3	
Level of Service	A		D	D	D	
Approach Delay (s)	0.7			38.8	44.3	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	24.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	99.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	176	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	191	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	289	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.10	-0.15	0.04
Departure Headway (s)	4.4	4.9	4.2	4.6
Degree Utilization, x	0.02	0.15	0.34	0.12
Capacity (veh/h)	727	682	834	746
Control Delay (s)	7.5	8.7	9.3	8.2
Approach Delay (s)	7.5	8.7	9.3	8.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.9	
HCM Level of Service			A	
Intersection Capacity Utilization		36.1%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	130	36	28	683	638	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	39	30	742	693	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.76	0.76	0.76			
vC, conflicting volume	1585	782	871			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1771	713	830			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	88	95			
cM capacity (veh/h)	66	328	609			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	180	30	742	871
Volume Left	141	30	0	0
Volume Right	39	0	0	177
cSH	80	609	1700	1700
Volume to Capacity	2.26	0.05	0.44	0.51
Queue Length 95th (ft)	416	4	0	0
Control Delay (s)	690.4	11.2	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	690.4	0.4		0.0
Approach LOS	F			

Intersection Summary				
Average Delay		68.5		
Intersection Capacity Utilization		59.6%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1643		1770	3539	1489		3491	
Flt Permitted		0.97	1.00	0.95	0.97		0.18	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1643		338	3539	1489		3218	
Volume (vph)	31	22	136	820	78	72	151	502	418	25	633	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	891	85	78	164	546	454	27	688	60
RTOR Reduction (vph)	0	0	37	0	6	0	0	0	224	0	5	0
Lane Group Flow (vph)	0	58	111	545	503	0	164	546	230	0	770	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	37.6	37.6		36.4	36.4	36.4		36.4	
Effective Green, g (s)		24.5	24.5	37.6	37.6		35.9	35.9	35.9		35.9	
Actuated g/C Ratio		0.22	0.22	0.34	0.34		0.33	0.33	0.33		0.33	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	575	562		110	1155	486		1050	
v/s Ratio Prot		0.03		c0.32	0.31			0.15				
v/s Ratio Perm			c0.07				c0.49		0.15		0.24	
v/c Ratio		0.14	0.32	0.95	0.90		1.49	0.47	0.47		0.73	
Uniform Delay, d1		34.3	35.7	35.2	34.3		37.0	29.5	29.5		32.8	
Progression Factor		1.00	1.00	0.54	0.53		0.45	0.43	0.43		1.00	
Incremental Delay, d2		0.7	2.3	22.8	15.0		225.3	0.1	0.3		4.5	
Delay (s)		35.1	38.1	42.0	33.1		241.9	12.7	13.1		37.3	
Level of Service		D	D	D	C		F	B	B		D	
Approach Delay (s)		37.2			37.7			45.2			37.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	377	72	655	951	304	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	78	712	1034	330	359
RTOR Reduction (vph)	0	36	0	0	0	23
Lane Group Flow (vph)	410	42	712	1034	330	336
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	28.5	59.9	27.9	74.5	43.1	75.1
Effective Green, g (s)	28.0	59.4	27.4	74.0	42.6	74.6
Actuated g/C Ratio	0.25	0.54	0.25	0.67	0.39	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	451	855	855	1253	721	1074
v/s Ratio Prot	c0.23	0.03	0.21	c0.56	0.18	0.21
v/s Ratio Perm						
v/c Ratio	0.91	0.05	0.83	0.83	0.46	0.31
Uniform Delay, d1	39.8	12.0	39.1	13.2	25.1	7.2
Progression Factor	0.50	0.44	0.55	1.87	1.00	1.00
Incremental Delay, d2	18.2	0.0	3.5	3.1	2.1	0.2
Delay (s)	38.2	5.3	25.2	27.8	27.2	7.4
Level of Service	D	A	C	C	C	A
Approach Delay (s)	32.9			26.8	16.9	
Approach LOS	C			C	B	

Intersection Summary				
HCM Average Control Delay	25.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Volume (vph)	26	21	7	1008	13	16	41	306	1299	135	447	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	1096	14	17	45	333	1412	147	486	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	572	554	0	45	333	1412	147	517	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.5	3.5	3.5	25.9	25.9		4.0	20.2	73.8	8.7	24.9	
Effective Green, g (s)	3.0	3.0	3.0	25.9	25.9		3.5	20.7	73.8	8.2	25.4	
Actuated g/C Ratio	0.04	0.04	0.04	0.35	0.35		0.05	0.28	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	64	590	590		84	993	1583	197	632	
v/s Ratio Prot	0.02	0.01		0.34	0.33		0.03	0.09		0.08	0.28	
v/s Ratio Perm			0.00						c0.89			
v/c Ratio	0.39	0.30	0.01	0.97	0.94		0.54	0.34	0.89	0.75	0.82	
Uniform Delay, d1	34.5	34.4	34.0	23.6	23.2		34.4	21.1	0.0	31.8	22.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	29.1	22.7		3.3	0.1	8.1	12.6	7.9	
Delay (s)	35.8	35.2	34.0	52.7	45.9		37.6	21.2	8.1	44.4	30.0	
Level of Service	D	D	C	D	D		D	C	A	D	C	
Approach Delay (s)		35.3			49.3			11.2			33.2	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	27.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			2947	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			2947	1399				3433		1583
Volume (vph)	113	281	1	0	359	1544	0	0	0	1231	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1678	0	0	0	1338	0	263
RTOR Reduction (vph)	0	0	0	0	191	0	0	0	0	0	0	115
Lane Group Flow (vph)	123	306	0	0	726	1151	0	0	0	1338	0	148
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	55.2			39.9	110.0				46.3		46.3
Effective Green, g (s)	11.3	55.2			39.9	110.0				46.8		46.8
Actuated g/C Ratio	0.10	0.50			0.36	1.00				0.43		0.43
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1775			1069	1399				1461		673
v/s Ratio Prot	0.07	0.09			0.25							0.09
v/s Ratio Perm						c0.82				c0.39		
v/c Ratio	0.68	0.17			0.68	0.82				0.92		0.22
Uniform Delay, d1	47.6	14.9			29.6	0.0				29.7		20.0
Progression Factor	1.00	1.00			1.11	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.5	2.4				9.2		0.1
Delay (s)	55.2	15.2			34.3	2.4				39.0		20.2
Level of Service	E	B			C	A				D		C
Approach Delay (s)		26.6			16.5			0.0			35.9	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	25.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	111	1400	0	0	1517	426	386	21	1309	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1522	0	0	1649	463	420	23	1423	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	296	0	161	1	0	0	0
Lane Group Flow (vph)	121	1522	0	0	1649	167	420	573	711	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.8	37.0			39.7	39.7	48.0	48.0	65.0			
Effective Green, g (s)	10.3	37.0			39.7	39.7	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	166	1197			1674	526	734	632	389			
v/s Ratio Prot	0.07	c0.43			c0.36		0.25	0.40	c1.08			
v/s Ratio Perm						0.11						
v/c Ratio	0.73	1.27			0.99	0.32	0.57	0.91	1.83			
Uniform Delay, d1	48.5	36.5			34.9	25.4	23.3	28.9	22.5			
Progression Factor	1.24	0.59			0.95	1.18	1.00	1.00	1.00			
Incremental Delay, d2	8.9	126.8			13.5	0.9	3.2	19.1	382.7			
Delay (s)	69.2	148.3			46.6	30.9	26.5	48.0	405.2			
Level of Service	E	F			D	C	C	D	F			
Approach Delay (s)		142.5			43.2			179.5			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	117.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1816	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1816	2628
Volume (vph)	699	759	1251	350	668	295	227	62	101	289	270	1041
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	760	825	1360	380	726	321	247	67	110	314	293	1132
RTOR Reduction (vph)	0	120	85	0	0	88	0	0	98	0	0	34
Lane Group Flow (vph)	760	1331	649	380	726	233	153	161	12	0	607	1098
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.22	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.33	0.42
v/s Ratio Perm						0.15			0.01			
v/c Ratio	1.28	1.35	1.25	1.39	0.68	0.51	0.84	0.86	0.07		1.23	0.87
Uniform Delay, d1	45.5	37.5	31.5	46.5	33.9	31.8	48.0	48.2	44.0		40.0	25.4
Progression Factor	1.25	1.03	1.08	1.00	1.00	1.00	1.26	1.26	2.47		0.93	0.75
Incremental Delay, d2	128.0	157.5	111.8	195.1	3.6	4.0	23.7	26.6	0.1		112.5	5.1
Delay (s)	184.8	196.2	145.8	241.6	37.5	35.8	84.3	87.3	108.7		149.8	24.2
Level of Service	F	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		180.7			91.5			91.8			68.0	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	125.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1572	21	0	378	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1709	23	0	411	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1731	0	0	411	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.49			0.22	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.93			0.48	
Uniform Delay, d1	21.7	21.7	26.3					24.1			20.6	
Progression Factor	1.03	1.04	1.10					0.56			0.53	
Incremental Delay, d2	0.7	0.3	5.7					7.1			1.8	
Delay (s)	23.0	22.8	34.5					20.5			12.7	
Level of Service	C	C	C					C			B	
Approach Delay (s)		31.5			0.0			20.5			12.7	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	74.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Volume (vph)	86	615	342	38	742	36	282	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	668	372	41	807	39	307	238	24	39	250	103
RTOR Reduction (vph)	0	102	0	0	5	0	0	5	0	0	0	83
Lane Group Flow (vph)	93	938	0	41	841	0	307	257	0	39	250	20
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.7		2.3	18.0		14.1	14.1		12.8	12.8	12.8
Effective Green, g (s)	4.0	19.7		2.3	18.0		14.1	14.1		12.8	12.8	12.8
Actuated g/C Ratio	0.06	0.30		0.04	0.28		0.22	0.22		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	109	1012		63	973		385	398		349	367	305
v/s Ratio Prot	c0.05	c0.28		0.02	0.24		c0.17	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.93		0.65	0.86		0.80	0.64		0.11	0.68	0.07
Uniform Delay, d1	30.2	21.9		30.9	22.3		24.0	23.1		21.4	24.2	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.8	13.8		21.5	8.1		10.9	3.6		0.1	5.1	0.1
Delay (s)	74.0	35.7		52.4	30.4		35.0	26.7		21.5	29.3	21.3
Level of Service	E	D		D	C		C	C		C	C	C
Approach Delay (s)		38.8			31.4			31.2			26.4	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	33.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3436		1770	3519			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3436		1770	3519			1802	1555		1774	
Volume (vph)	18	1040	164	175	1118	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1130	178	190	1215	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1299	0	190	1246	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1519		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.38		c0.11	0.35			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.85		0.97	0.65			0.76	0.15		0.22	
Uniform Delay, d1	49.4	25.0		44.3	16.2			39.8	35.7		39.7	
Progression Factor	1.05	0.54		0.81	0.68			1.00	1.00		1.00	
Incremental Delay, d2	217.2	6.0		23.5	0.4			9.9	0.2		0.4	
Delay (s)	268.9	19.4		59.2	11.4			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		23.2			17.7			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3065		1770	3364		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3065		1770	3364		3433	3511		1770	3339	
Volume (vph)	167	658	422	72	541	102	572	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	715	459	78	588	111	622	988	27	160	1017	200
RTOR Reduction (vph)	0	102	0	0	15	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1072	0	78	684	0	622	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	990		83	817		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.35		0.04	0.20		c0.18	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.08		0.94	0.84		1.13	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.8		47.5	36.0		42.0	29.4		42.9	34.5	
Progression Factor	1.17	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.4	49.0		77.0	10.0		80.6	6.1		15.0	82.9	
Delay (s)	62.3	63.4		124.5	45.9		122.6	35.5		57.8	117.4	
Level of Service	E	E		F	D		F	D		E	F	
Approach Delay (s)		63.2			53.8			68.6			110.5	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM Average Control Delay	76.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
ALTERNATIVE #3
2030

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3381		1770	3502		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3381		1770	3502		1770	3436		1770	1863	1583
Volume (vph)	577	881	372	118	778	59	121	271	66	68	273	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	392	124	819	62	127	285	69	72	287	214
RTOR Reduction (vph)	0	40	0	0	5	0	0	20	0	0	0	178
Lane Group Flow (vph)	607	1279	0	124	876	0	127	334	0	72	287	36
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	49.2		11.0	25.2		14.3	14.3		18.5	18.5	18.5
Effective Green, g (s)	35.0	50.2		11.0	26.2		14.3	14.3		18.5	18.5	18.5
Actuated g/C Ratio	0.32	0.46		0.10	0.24		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1543		177	834		230	447		298	313	266
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.15	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.83		0.70	1.05		0.55	0.75		0.24	0.92	0.14
Uniform Delay, d1	37.5	26.1		47.9	41.9		44.8	46.1		39.7	45.0	38.9
Progression Factor	1.00	1.00		0.88	1.16		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.3		4.5	33.8		2.3	6.4		0.4	30.1	0.2
Delay (s)	98.2	31.4		46.7	82.6		47.1	52.5		40.1	75.1	39.2
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		52.5			78.1			51.1			57.3	
Approach LOS		D			E			D			E	

Intersection Summary					
HCM Average Control Delay	59.5	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	89.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3420		1770	3480		1770	3460	
Flt Permitted	0.19	1.00			0.62		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	355	3451			2134		1770	3480		1770	3460	
Volume (vph)	123	746	148	88	602	162	218	799	100	119	888	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	93	634	171	229	841	105	125	935	164
RTOR Reduction (vph)	0	16	0	0	19	0	0	9	0	0	13	0
Lane Group Flow (vph)	129	925	0	0	879	0	229	937	0	125	1086	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	46.6	46.6			46.6		15.7	34.4		16.0	34.7	
Effective Green, g (s)	46.6	46.6			46.6		15.7	35.4		16.0	35.7	
Actuated g/C Ratio	0.42	0.42			0.42		0.14	0.32		0.15	0.32	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	150	1462			904		253	1120		257	1123	
v/s Ratio Prot		0.27					0.13	c0.27		0.07	c0.31	
v/s Ratio Perm	0.36				c0.41							
v/c Ratio	0.86	0.63			0.97		0.91	0.84		0.49	0.97	
Uniform Delay, d1	28.7	25.0			31.1		46.4	34.6		43.2	36.6	
Progression Factor	0.39	0.41			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.6	0.5			23.2		32.4	7.5		1.5	20.0	
Delay (s)	35.8	10.7			54.3		78.8	42.1		44.7	56.6	
Level of Service	D	B			D		E	D		D	E	
Approach Delay (s)		13.7			54.3			49.3			55.4	
Approach LOS		B			D			D			E	

Intersection Summary				
HCM Average Control Delay	43.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	104.6%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	111	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	117	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	470	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	470	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	89	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	418	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	119	1
Volume Left	0	145	2	0
Volume Right	2	1	117	0
cSH	1545	1616	1062	520
Volume to Capacity	0.00	0.09	0.11	0.00
Queue Length 95th (ft)	0	7	9	0
Control Delay (s)	0.0	5.5	8.8	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.8	11.9
Approach LOS			A	B

Intersection Summary				
Average Delay	6.6			
Intersection Capacity Utilization	32.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 3 AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	76	61	5	95	47	222	11	130	86	120	344	152	228	9	50	181	169	14

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	142	364	227	616	237	231	183
Delay	37.4	1.2	32.0	36.1	0.8	32.9	42.7
LOS	D	A	C	D	A	C	D

HCM Average Control Delay	**35.9**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1632			1855	1583	1770	1777	
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1632			1755	1583	1770	1777	
Volume (vph)	76	61	5	95	47	222	11	130	86	120	344	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	64	5	100	49	234	12	137	91	126	362	160
RTOR Reduction (vph)	0	3	0	0	124	0	0	0	75	0	14	0
Lane Group Flow (vph)	80	66	0	100	159	0	0	149	16	126	508	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	9.1	9.1		36.0	36.0			15.2	15.2	10.7	29.9	
Effective Green, g (s)	9.1	9.1		36.0	36.0			15.2	15.2	10.7	29.9	
Actuated g/C Ratio	0.10	0.10		0.41	0.41			0.17	0.17	0.12	0.34	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	185	193		732	675			307	277	218	611	
v/s Ratio Prot	c0.05	0.04		0.06	c0.10					0.07	c0.29	
v/s Ratio Perm								0.08	0.01			
v/c Ratio	0.43	0.34		0.14	0.24			0.49	0.06	0.58	0.83	
Uniform Delay, d1	36.5	36.2		15.8	16.6			32.4	29.9	36.0	26.2	
Progression Factor	1.00	1.00		0.17	0.04			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8		0.0	0.1			0.9	0.1	2.3	9.3	
Delay (s)	37.7	37.0		2.7	0.7			33.3	30.0	38.3	35.5	
Level of Service	D	D		A	A			C	C	D	D	
Approach Delay (s)		37.4			1.2			32.0			36.1	
Approach LOS		D			A			C			D	

Intersection Summary				
HCM Average Control Delay	26.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1762	
Flt Permitted	1.00		0.21	1.00	0.96	
Satd. Flow (perm)	1855		394	1863	1762	
Volume (vph)	259	9	50	195	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	9	53	205	178	15
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	281	0	53	205	190	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	65.9		18.9	18.9	13.1	
Effective Green, g (s)	65.9		18.9	18.9	13.1	
Actuated g/C Ratio	0.76		0.22	0.22	0.15	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1405		86	405	265	
v/s Ratio Prot	c0.15			0.11	c0.11	
v/s Ratio Perm			c0.13			
v/c Ratio	0.20		0.62	0.51	0.72	
Uniform Delay, d1	3.0		30.8	29.9	35.2	
Progression Factor	0.24		1.00	1.00	1.00	
Incremental Delay, d2	0.1		10.7	0.7	7.5	
Delay (s)	0.8		41.5	30.7	42.7	
Level of Service	A		D	C	D	
Approach Delay (s)	0.8			32.9	42.7	
Approach LOS	A			C	D	

Intersection Summary				
HCM Average Control Delay	23.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1827		1770	1851		1770	1815	
Flt Permitted		0.90			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1573			1441		1770	1851		1770	1815	
Volume (vph)	79	90	132	37	80	4	36	338	14	23	524	108
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	95	139	39	84	4	38	356	15	24	552	114
RTOR Reduction (vph)	0	56	0	0	2	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	261	0	0	125	0	38	369	0	24	654	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		315			288		85	1003		32	929	
v/s Ratio Prot							c0.02	0.20		0.01	c0.36	
v/s Ratio Perm		c0.17			0.09							
v/c Ratio		0.83			0.43		0.45	0.37		0.75	0.70	
Uniform Delay, d1		19.2			17.5		23.2	6.5		24.4	9.3	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		15.9			0.8		2.7	1.0		62.8	4.5	
Delay (s)		35.1			18.3		23.4	8.5		87.2	13.8	
Level of Service		D			B		C	A		F	B	
Approach Delay (s)		35.1			18.3			9.9			16.3	
Approach LOS		D			B			A			B	

Intersection Summary				
HCM Average Control Delay	18.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	110	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	116	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	205	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.14	0.01
Departure Headway (s)	4.5	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.24	0.18
Capacity (veh/h)	725	685	844	799
Control Delay (s)	7.6	8.4	8.4	8.3
Approach Delay (s)	7.6	8.4	8.4	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.3			
HCM Level of Service	A			
Intersection Capacity Utilization	38.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	79	24	23	166	399	45
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	25	24	175	420	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	667	444	467			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	643	403	429			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	96	98			
cM capacity (veh/h)	399	603	1054			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	108	24	175	467
Volume Left	83	24	0	0
Volume Right	25	0	0	47
cSH	433	1054	1700	1700
Volume to Capacity	0.25	0.02	0.10	0.27
Queue Length 95th (ft)	24	2	0	0
Control Delay (s)	16.1	8.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.1	1.0		0.0
Approach LOS	C			

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			36.2%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1663		1770	3539	1583		3523	
Flt Permitted		0.97	1.00	0.95	0.96		0.48	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1663		887	3539	1583		3320	
Volume (vph)	39	28	117	406	4	29	60	222	121	17	415	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	427	4	31	63	234	127	18	437	8
RTOR Reduction (vph)	0	0	116	0	6	0	0	0	43	0	1	0
Lane Group Flow (vph)	0	70	7	239	217	0	63	234	84	0	462	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.8	15.8		66.8	66.8	66.8		66.8	
Effective Green, g (s)		5.9	5.9	15.8	15.8		66.3	66.3	66.3		66.3	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	266	263		588	2346	1050		2201	
v/s Ratio Prot		c0.04		c0.14	0.13			0.07				
v/s Ratio Perm			0.00				0.07		0.05		c0.14	
v/c Ratio		0.65	0.08	0.90	0.83		0.11	0.10	0.08		0.21	
Uniform Delay, d1		46.1	44.5	41.3	40.8		6.1	6.1	6.0		6.6	
Progression Factor		1.00	1.00	1.52	1.54		0.06	0.08	0.00		1.00	
Incremental Delay, d2		12.1	0.3	29.1	18.1		0.3	0.1	0.1		0.2	
Delay (s)		58.2	44.7	92.0	80.8		0.7	0.6	0.1		6.8	
Level of Service		E	D	F	F		A	A	A		A	
Approach Delay (s)		49.6			86.6			0.5			6.8	
Approach LOS		D			F			A			A	

Intersection Summary				
HCM Average Control Delay		34.3	HCM Level of Service	C
HCM Volume to Capacity ratio		0.36		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		47.8%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	83	38	285	213	154	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	40	300	224	162	213
RTOR Reduction (vph)	0	29	0	0	0	185
Lane Group Flow (vph)	87	11	300	224	162	28
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	9.9	28.2	14.8	83.1	64.8	9.9
Effective Green, g (s)	9.4	27.7	14.3	82.6	64.3	9.4
Actuated g/C Ratio	0.09	0.28	0.14	0.83	0.64	0.09
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	166	438	491	1539	1198	149
v/s Ratio Prot	c0.05	0.01	c0.09	c0.12	0.09	0.02
v/s Ratio Perm						
v/c Ratio	0.52	0.03	0.61	0.15	0.14	0.19
Uniform Delay, d1	43.2	26.3	40.2	1.7	7.0	41.8
Progression Factor	0.85	2.73	1.00	0.09	1.00	1.00
Incremental Delay, d2	2.9	0.0	2.2	0.2	0.2	0.6
Delay (s)	39.6	71.8	42.5	0.4	7.2	42.4
Level of Service	D	E	D	A	A	D
Approach Delay (s)	49.7			24.5	27.2	
Approach LOS	D			C	C	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1804	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1804	
Volume (vph)	5	21	16	720	79	0	88	110	964	76	265	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	758	83	0	93	116	1015	80	279	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	409	432	0	93	116	1015	80	344	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.9	2.9	2.9	24.9	24.9		4.8	16.7	64.5	4.5	16.4	
Effective Green, g (s)	2.4	2.4	2.4	24.9	24.9		4.3	17.2	64.5	4.0	16.9	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.07	0.27	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	649	657		118	944	1583	110	473	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	0.19	
v/s Ratio Perm			0.00						c0.64			
v/c Ratio	0.08	0.32	0.01	0.63	0.66		0.79	0.12	0.64	0.73	0.73	
Uniform Delay, d1	30.0	30.3	29.9	16.1	16.3		29.7	17.9	0.0	29.7	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.7	2.1		26.6	0.0	2.0	18.2	5.2	
Delay (s)	30.2	31.2	29.9	17.8	18.4		56.3	18.0	2.0	48.0	26.9	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.6			18.1			7.6			30.7	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	0.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			0.99	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3288			3371	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3288			3371	1441				3433		1583
Volume (vph)	120	236	211	0	741	1152	0	0	0	844	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1213	0	0	0	888	0	151
RTOR Reduction (vph)	0	84	0	0	2	0	0	0	0	0	0	106
Lane Group Flow (vph)	126	386	0	0	808	1183	0	0	0	888	0	45
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.0			39.0	100.0				29.5		29.5
Effective Green, g (s)	19.0	62.0			39.0	100.0				30.0		30.0
Actuated g/C Ratio	0.19	0.62			0.39	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2039			1315	1441				1030		475
v/s Ratio Prot	0.07	0.12			0.24					0.26		
v/s Ratio Perm						c0.82						0.03
v/c Ratio	0.38	0.19			0.61	0.82				0.86		0.10
Uniform Delay, d1	35.3	8.2			24.5	0.0				33.0		25.2
Progression Factor	1.00	1.00			0.65	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	2.2				7.5		0.1
Delay (s)	35.6	8.4			16.8	2.2				40.5		25.3
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.1			8.1			0.0			38.3	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1461	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1461	1504			
Volume (vph)	82	997	0	0	1248	402	645	2	1254	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1049	0	0	1314	423	679	2	1320	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	288	0	76	30	0	0	0
Lane Group Flow (vph)	86	1049	0	0	1314	135	604	629	662	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	555	677			
v/s Ratio Prot	0.05	c0.21			c0.28		0.36	c0.43	c0.44			
v/s Ratio Perm						0.09						
v/c Ratio	0.27	0.44			0.89	0.27	0.95	1.13	0.98			
Uniform Delay, d1	35.3	17.7			32.3	25.3	30.0	31.0	27.0			
Progression Factor	0.71	0.48			0.52	0.29	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.5			6.3	1.0	23.0	80.8	28.8			
Delay (s)	26.9	9.0			23.1	8.3	53.0	111.8	55.8			
Level of Service	C	A			C	A	D	F	E			
Approach Delay (s)		10.4			19.5			74.7			0.0	
Approach LOS		B			B			E			A	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1791	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1791	2628
Volume (vph)	315	1601	334	75	843	99	42	3	42	186	45	771
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	315	1601	334	75	843	99	42	3	42	186	45	771
RTOR Reduction (vph)	0	0	145	0	0	18	0	0	39	0	0	194
Lane Group Flow (vph)	315	1601	189	75	843	81	22	23	3	0	231	577
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		537	1317
v/s Ratio Prot	0.09	c0.47	c0.13	0.04	c0.24		0.01	0.01			0.13	c0.22
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.46	1.16	0.25	0.67	0.88	0.19	0.19	0.20	0.03		0.43	0.44
Uniform Delay, d1	35.1	29.6	13.4	45.8	35.0	28.1	43.9	43.9	43.4		28.1	16.0
Progression Factor	1.11	0.61	0.37	1.00	1.00	1.00	1.00	1.00	1.00		1.27	1.09
Incremental Delay, d2	1.3	76.3	0.1	11.2	11.5	1.0	0.6	0.6	0.1		2.2	0.9
Delay (s)	40.3	94.3	5.0	57.0	46.5	29.1	44.5	44.5	43.5		37.9	18.2
Level of Service	D	F	A	E	D	C	D	D	D		D	B
Approach Delay (s)		73.5			45.6			44.0			22.8	
Approach LOS		E			D			D			C	

Intersection Summary				
HCM Average Control Delay	54.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	221	0	0	0	0	507	9	0	195	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	534	9	0	205	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	542	0	0	205	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.15			0.11	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.24			0.20	
Uniform Delay, d1	26.8	26.8	21.1					7.4			10.9	
Progression Factor	0.99	0.98	0.90					1.00			0.96	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.4	
Delay (s)	26.7	26.3	19.0					7.7			10.9	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.0			0.0			7.7			10.9	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	24.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3336		1770	3483		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3336		1770	3483		1770	1839		1770	1863	1583
Volume (vph)	405	495	306	36	527	63	294	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	521	322	38	555	66	309	286	27	32	306	115
RTOR Reduction (vph)	0	83	0	0	9	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	760	0	38	612	0	309	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	22.1	39.0		5.7	22.6		20.8	20.8		19.5	19.5	19.5
Effective Green, g (s)	21.6	39.5		5.2	23.1		20.3	20.3		19.0	19.0	19.0
Actuated g/C Ratio	0.22	0.40		0.05	0.23		0.20	0.20		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	382	1318		92	805		359	373		336	354	301
v/s Ratio Prot	c0.24	0.23		0.02	c0.18		c0.17	0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.12	0.58		0.41	0.76		0.86	0.83		0.10	0.86	0.07
Uniform Delay, d1	39.2	23.7		45.9	35.9		38.5	38.2		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.02	1.02		0.75	0.80	1.33
Incremental Delay, d2	81.0	1.8		3.0	6.7		18.5	14.4		0.1	17.7	0.1
Delay (s)	120.2	25.5		48.9	42.5		57.6	53.2		25.2	49.1	44.2
Level of Service	F	C		D	D		E	D		C	D	D
Approach Delay (s)		57.3			42.9			55.4			46.2	
Approach LOS		E			D			E			D	

Intersection Summary					
HCM Average Control Delay	52.1	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	83.9%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3387		1770	3517		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3387		1770	3517		1770	3497		1770	3487	
Volume (vph)	103	315	127	105	503	22	125	706	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	332	134	111	529	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	47	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	419	0	111	549	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.1		10.8	20.9		12.5	48.9		7.2	43.6	
Effective Green, g (s)	7.0	18.6		9.8	21.4		11.5	49.4		6.2	44.1	
Actuated g/C Ratio	0.07	0.19		0.10	0.21		0.12	0.49		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	630		173	753		204	1728		110	1538	
v/s Ratio Prot	c0.06	0.12		0.06	c0.16		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.66		0.64	0.73		0.65	0.46		0.47	0.67	
Uniform Delay, d1	46.1	37.8		43.4	36.6		42.3	16.6		45.3	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.7		7.9	3.5		6.9	0.9		3.2	2.4	
Delay (s)	90.2	40.5		51.3	40.1		49.2	17.5		48.5	24.6	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.8			42.0			22.0			25.7	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	32.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3414		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3414		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	295	91	83	410	324	90	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	311	96	87	432	341	95	395	45	101	151	9
RTOR Reduction (vph)	0	25	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	382	0	87	432	129	95	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1127		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.05	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.34		0.67	0.32	0.22	0.21	0.93			0.78	
Uniform Delay, d1	48.1	25.3		45.2	22.1	21.1	29.3	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.8		11.9	0.6	0.8	0.2	25.3			11.1	
Delay (s)	60.4	26.1		57.1	22.8	21.9	29.5	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.1			25.9			56.0			50.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	37.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3453		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3453		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	69	57	770	211	136	326	40	176	253	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	73	60	811	222	143	343	42	185	266	11
RTOR Reduction (vph)	0	13	0	0	0	118	0	0	31	0	2	0
Lane Group Flow (vph)	29	434	0	60	811	104	143	343	11	185	275	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.3		7.1	46.9	46.9	12.2	25.6	25.6	8.5	21.9	
Effective Green, g (s)	4.0	44.3		6.6	46.9	46.9	11.7	25.1	25.1	8.0	21.4	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.21	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1530		117	1660	742	207	468	397	142	396	
v/s Ratio Prot	0.02	0.13		c0.03	c0.23		0.08	c0.18		c0.10	0.15	
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.14	0.69	0.73	0.03	1.30	0.70	
Uniform Delay, d1	46.8	17.7		45.1	18.3	15.1	42.4	34.4	28.2	46.0	36.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.84	
Incremental Delay, d2	2.8	0.5		2.8	1.0	0.4	8.8	5.5	0.0	175.1	4.4	
Delay (s)	49.6	18.2		48.0	19.3	15.5	51.2	39.9	28.3	222.2	35.0	
Level of Service	D	B		D	B	B	D	D	C	F	D	
Approach Delay (s)		20.1			20.1			42.0			110.0	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM Average Control Delay	40.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	528	16	90	1013	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	556	17	95	1066	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1092			573			1342	1898	286	1684	1894	546
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1092			573			1342	1898	286	1684	1894	546
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			90			71	77	89	95	95	100
cM capacity (veh/h)	635			996			95	60	710	41	60	482

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	371	202	95	711	381	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	635	1700	1700	996	1700	1700	85	377	59
Volume to Capacity	0.04	0.22	0.12	0.10	0.42	0.22	0.40	0.22	0.11
Queue Length 95th (ft)	3	0	0	8	0	0	40	21	9
Control Delay (s)	10.9	0.0	0.0	9.0	0.0	0.0	73.4	17.3	73.0
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			33.4		73.0
Approach LOS							D		F

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3462		1770	3506			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3462		1770	3506			1810	1583		1408	
Volume (vph)	3	509	86	122	816	54	244	178	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	536	91	128	859	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	615	0	128	912	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.2		11.0	49.3			26.5	26.5		8.8	
Effective Green, g (s)	0.4	39.2		10.5	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.39		0.10	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1357		186	1728			471	412		117	
v/s Ratio Prot	0.00	c0.18		c0.07	c0.26			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.45		0.69	0.53			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.5		43.2	17.4			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.98	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.1		5.1	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.6		47.4	11.0			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.8			15.5			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary					
HCM Average Control Delay	28.6	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3361		1770	3390		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3361		1770	3390		3433	3535		1770	3509	
Volume (vph)	98	363	183	32	574	225	351	961	8	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	382	193	34	604	237	369	1012	8	175	1072	64
RTOR Reduction (vph)	0	62	0	0	37	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	513	0	34	804	0	369	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	31.0		7.2	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	30.0		6.2	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.30		0.06	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	1008		110	956		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.51		0.31	0.84		0.77	0.82		0.78	0.95	
Uniform Delay, d1	44.9	28.9		44.9	33.8		41.4	29.5		42.4	32.3	
Progression Factor	1.50	1.28		1.13	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.3		0.5	6.0		6.5	6.1		15.3	17.2	
Delay (s)	80.8	37.2		51.3	41.7		47.9	35.6		57.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		43.8			42.0			38.9			50.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	43.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3499			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3506		1770	3499			3169			2905	
Volume (vph)	58	457	30	111	728	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	481	32	117	766	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	504	0	117	819	0	0	195	0	0	367	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		166	1882			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.23							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.44			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.83	1.15		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.7	0.4		10.6	0.7			0.4			5.2	
Delay (s)	38.1	9.0		32.5	7.7			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.1			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	14.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	1.00			0.94			0.95			0.89	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	1854			1738			1728			1642	
Flt Permitted	0.44	1.00			0.98			0.92			0.95	
Satd. Flow (perm)	819	1854			1714			1613			1569	
Volume (vph)	440	58	2	8	83	84	2	1	2	49	4	248
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	463	61	2	8	87	88	2	1	2	52	4	261
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	199	0
Lane Group Flow (vph)	463	62	0	0	120	0	0	3	0	0	118	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.5	20.5			6.5			8.9			8.9	
Effective Green, g (s)	20.5	20.5			6.5			8.9			8.9	
Actuated g/C Ratio	0.55	0.55			0.17			0.24			0.24	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	703	1016			298			384			373	
v/s Ratio Prot	c0.18	0.03										
v/s Ratio Perm	c0.18				0.07			0.00			c0.08	
v/c Ratio	0.66	0.06			0.40			0.01			0.32	
Uniform Delay, d1	5.9	4.0			13.7			10.9			11.7	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.2	0.0			0.9			0.0			0.5	
Delay (s)	8.1	4.0			14.6			10.9			12.2	
Level of Service	A	A			B			B			B	
Approach Delay (s)		7.6			14.6			10.9			12.2	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3509			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3509			3494	
Volume (vph)	77	193	12	112	289	20	0	1217	72	0	1132	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1281	76	0	1192	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1353	0	0	1297	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2045			2037	
v/s Ratio Prot					c0.13			c0.39			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.66			0.64	
Uniform Delay, d1		44.0			41.9			14.9			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.7			1.5	
Delay (s)		57.5			47.6			16.6			16.1	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.6			16.1	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3253			5077	
Volume (vph)	0	0	0	65	656	814	12	626	0	0	1178	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	659	0	0	1240	13
RTOR Reduction (vph)	0	0	0	0	0	144	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	713	0	672	0	0	1252	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1789			2792	
v/s Ratio Prot					0.22						c0.25	
v/s Ratio Perm						c0.45		0.21				
v/c Ratio					0.58	1.22		0.38			0.45	
Uniform Delay, d1					25.3	31.5		12.8			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	112.7		0.6			0.5	
Delay (s)					25.7	144.2		13.4			14.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			88.6			13.4			14.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	47.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3497		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3497		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	620	54	532	679	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	653	57	560	715	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	703	0	560	715	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1514		638	2391	
v/s Ratio Prot		c0.15						c0.20		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.46		0.88	0.30	
Uniform Delay, d1		25.6						14.1		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.0		12.6	0.0	
Delay (s)		28.2						15.1		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.1			20.3	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3429		1770	3498		1770	3425		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3429		1770	3498		1770	3425		1770	1863	1583
Volume (vph)	300	794	209	148	903	76	202	511	140	151	387	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	220	156	951	80	213	538	147	159	407	533
RTOR Reduction (vph)	0	21	0	0	6	0	0	22	0	0	0	294
Lane Group Flow (vph)	316	1035	0	156	1025	0	213	663	0	159	407	239
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	38.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1222		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.12	c0.19		0.09	c0.22	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.66	1.06		0.45	1.09	0.75
Uniform Delay, d1	43.5	32.6		47.1	39.6		41.9	45.0		38.7	44.0	41.4
Progression Factor	1.00	1.00		1.18	0.91		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.4		1.5	25.7		3.6	50.4		0.9	73.3	9.7
Delay (s)	72.8	40.0		57.1	61.8		45.3	95.8		39.6	117.3	51.1
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.6			61.2			83.8			74.0	
Approach LOS		D			E			F			E	

Intersection Summary				
HCM Average Control Delay	64.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3437		1770	3483		1770	3459	
Flt Permitted	0.15	1.00			0.57		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	286	3382			1971		1770	3483		1770	3459	
Volume (vph)	202	684	288	108	702	149	279	1252	148	191	1138	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	114	739	157	294	1318	156	201	1198	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	8	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	996	0	294	1466	0	201	1398	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	125	1476			860		274	1108		241	1038	
v/s Ratio Prot		0.29					0.17	c0.42		0.11	c0.40	
v/s Ratio Perm	c0.74				0.51							
v/c Ratio	1.70	0.66			1.16		1.07	1.32		0.83	1.35	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.09	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	337.4	0.7			84.3		75.1	151.7		21.3	162.4	
Delay (s)	371.1	27.3			115.3		121.6	189.2		67.6	200.9	
Level of Service	F	C			F		F	F		E	F	
Approach Delay (s)		86.5			115.3			178.0			184.3	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	148.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	122.1%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	177	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	186	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	621	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	621	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	82	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	298	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	189	2
Volume Left	1	197	2	1
Volume Right	0	0	186	0
cSH	1599	1596	1036	359
Volume to Capacity	0.00	0.12	0.18	0.01
Queue Length 95th (ft)	0	11	17	0
Control Delay (s)	0.4	7.0	9.2	15.1
Lane LOS	A	A	A	C
Approach Delay (s)	0.4	7.0	9.2	15.1
Approach LOS			A	C

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 3 PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	137	79	6	208	106	501	10	415	268	93	521	110	387	21	37	374	388	43

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	222	815	693	724	408	411	431
Delay	54.6	10.9	100.2	52.4	2.3	219.6	269.1
LOS	D	B	F	D	A	F	F

HCM Average Control Delay	**131.3**
HCM Level of Service	**F**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1632			1860	1583	1770	1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1632			1430	1583	1770	1814	
Volume (vph)	137	79	6	208	106	501	10	415	268	93	521	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	83	6	219	112	527	11	437	282	98	548	116
RTOR Reduction (vph)	0	2	0	0	131	0	0	0	196	0	6	0
Lane Group Flow (vph)	144	87	0	219	508	0	0	448	86	98	658	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	14.3	14.3		46.0	46.0			32.1	32.1	10.8	46.9	
Effective Green, g (s)	14.3	14.3		46.0	46.0			32.1	32.1	10.8	46.9	
Actuated g/C Ratio	0.12	0.12		0.39	0.39			0.27	0.27	0.09	0.39	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	212	221		683	630			385	426	160	714	
v/s Ratio Prot	c0.08	0.05		0.12	c0.31					0.06	c0.36	
v/s Ratio Perm								c0.31	0.05			
v/c Ratio	0.68	0.39		0.32	0.81			1.16	0.20	0.61	0.92	
Uniform Delay, d1	50.3	48.5		25.6	32.6			43.5	33.7	52.2	34.4	
Progression Factor	1.00	1.00		0.26	0.36			1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.6	0.8		0.0	0.7			98.5	0.2	4.8	17.3	
Delay (s)	57.9	49.3		6.7	12.3			142.0	33.8	57.0	51.7	
Level of Service	E	D		A	B			F	C	E	D	
Approach Delay (s)		54.6			10.9			100.2			52.4	
Approach LOS		D			B			F			D	

Intersection Summary			
HCM Average Control Delay	52.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1851		1770	1863	1759	
Flt Permitted	1.00		0.19	1.00	0.96	
Satd. Flow (perm)	1851		355	1863	1759	
Volume (vph)	419	21	37	427	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	441	22	39	449	408	45
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	462	0	39	449	450	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	90.2		21.0	21.0	21.0	
Effective Green, g (s)	90.2		21.0	21.0	21.0	
Actuated g/C Ratio	0.76		0.18	0.18	0.18	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1401		63	328	310	
v/s Ratio Prot	c0.25			c0.24	c0.26	
v/s Ratio Perm			0.11			
v/c Ratio	0.33		0.62	1.37	1.45	
Uniform Delay, d1	4.7		45.4	49.1	49.1	
Progression Factor	0.48		1.00	1.00	1.00	
Incremental Delay, d2	0.1		14.5	184.3	220.0	
Delay (s)	2.3		59.9	233.4	269.1	
Level of Service	A		E	F	F	
Approach Delay (s)	2.3			219.6	269.1	
Approach LOS	A			F	F	

Intersection Summary			
HCM Average Control Delay	163.9	HCM Level of Service	F
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774			1811		1770	1843		1770	1746	
Flt Permitted		0.77			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1392			1595		1770	1843		1770	1746	
Volume (vph)	204	228	68	36	136	20	163	712	44	19	404	208
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	215	240	72	38	143	21	172	749	46	20	425	219
RTOR Reduction (vph)	0	11	0	0	8	0	0	3	0	0	34	0
Lane Group Flow (vph)	0	516	0	0	194	0	172	792	0	20	610	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		405			464		222	875		29	638	
v/s Ratio Prot							c0.10	c0.43		0.01	0.35	
v/s Ratio Perm		c0.37			0.12							
v/c Ratio		1.27			0.42		0.77	0.90		0.69	0.96	
Uniform Delay, d1		19.5			15.7		23.3	13.3		26.9	17.0	
Progression Factor		1.00			1.00		0.91	1.07		0.99	1.12	
Incremental Delay, d2		141.7			0.4		13.4	13.3		40.0	23.0	
Delay (s)		161.2			16.2		34.7	27.5		66.5	42.1	
Level of Service		F			B		C	C		E	D	
Approach Delay (s)		161.2			16.2			28.8			42.8	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	181	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	191	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	279	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.10	0.04
Departure Headway (s)	4.8	5.3	4.6	4.9
Degree Utilization, x	0.11	0.20	0.36	0.27
Capacity (veh/h)	656	613	742	698
Control Delay (s)	8.4	9.6	10.2	9.6
Approach Delay (s)	8.4	9.6	10.2	9.6
Approach LOS	A	A	B	A

Intersection Summary			
Delay	9.7		
HCM Level of Service	A		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	97	42	28	586	591	148
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	44	29	617	622	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.78	0.78	0.78			
vC, conflicting volume	1376	700	778			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1480	617	716			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	1	88	96			
cM capacity (veh/h)	104	384	692			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	146	29	617	778
Volume Left	102	29	0	0
Volume Right	44	0	0	156
cSH	133	692	1700	1700
Volume to Capacity	1.10	0.04	0.36	0.46
Queue Length 95th (ft)	207	3	0	0
Control Delay (s)	173.1	10.4	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	173.1	0.5		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		16.3	
Intersection Capacity Utilization		54.7%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1653		1770	3539	1452		3474	
Flt Permitted		0.97	1.00	0.95	0.97		0.27	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1653		510	3539	1452		3241	
Volume (vph)	12	5	95	646	63	53	130	392	219	22	557	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	680	66	56	137	413	231	23	586	71
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	142	0	8	0
Lane Group Flow (vph)	0	18	6	412	384	0	137	413	89	0	672	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	742		196	1358	557		1243	
v/s Ratio Prot		c0.01		c0.25	0.23			0.12				
v/s Ratio Perm			0.00				c0.27		0.06		0.21	
v/c Ratio		0.17	0.06	0.55	0.52		0.70	0.30	0.16		0.54	
Uniform Delay, d1		49.3	49.0	22.1	21.8		28.6	23.7	22.3		26.4	
Progression Factor		1.00	1.00	0.25	0.23		1.11	0.89	1.42		1.00	
Incremental Delay, d2		0.6	0.2	2.5	2.3		12.7	0.4	0.4		1.7	
Delay (s)		49.8	49.2	8.1	7.3		44.5	21.3	32.0		28.1	
Level of Service		D	D	A	A		D	C	C		C	
Approach Delay (s)		49.3			7.7			28.6			28.1	
Approach LOS		D			A			C			C	

Intersection Summary					
HCM Average Control Delay		22.4	HCM Level of Service		C
HCM Volume to Capacity ratio		0.59			
Actuated Cycle Length (s)		110.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization		70.3%	ICU Level of Service		C
Analysis Period (min)		15			
c Critical Lane Group					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	205	34	474	694	303	288
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	36	499	731	319	303
RTOR Reduction (vph)	0	21	0	0	0	121
Lane Group Flow (vph)	216	15	499	731	319	182
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	18.3	47.1	25.3	84.7	55.9	18.3
Effective Green, g (s)	17.8	46.6	24.8	84.2	55.4	17.8
Actuated g/C Ratio	0.16	0.42	0.23	0.77	0.50	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	286	671	774	1426	938	256
v/s Ratio Prot	c0.12	0.01	c0.15	c0.39	0.17	0.12
v/s Ratio Perm						
v/c Ratio	0.76	0.02	0.64	0.51	0.34	0.71
Uniform Delay, d1	44.0	18.4	38.6	5.0	16.4	43.7
Progression Factor	0.64	0.16	1.01	0.16	1.00	1.00
Incremental Delay, d2	10.3	0.0	1.5	1.1	1.0	9.0
Delay (s)	38.4	2.9	40.7	1.9	17.3	52.7
Level of Service	D	A	D	A	B	D
Approach Delay (s)	33.3			17.6	34.6	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	590	14	0	11	729	1468	269	598	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	621	15	0	12	767	1545	283	629	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	311	325	0	12	767	1545	283	676	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.2	16.2	16.2	20.8	20.8		1.2	24.2	94.3	17.6	40.6	
Effective Green, g (s)	15.7	15.7	15.7	20.8	20.8		0.7	24.7	94.3	17.1	41.1	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	295	310	264	371	373		13	927	1583	321	797	
v/s Ratio Prot	0.10	c0.21		0.18	0.19		0.01	0.22		0.16	0.37	
v/s Ratio Perm			0.03						c0.98			
v/c Ratio	0.61	1.25	0.17	0.84	0.87		0.92	0.83	0.98	0.88	0.85	
Uniform Delay, d1	36.5	39.3	33.7	35.1	35.5		46.8	32.8	0.0	37.6	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	138.4	0.1	14.9	19.3		205.3	6.0	17.6	22.9	8.2	
Delay (s)	39.1	177.7	33.8	50.0	54.7		252.0	38.8	17.6	60.5	32.0	
Level of Service	D	F	C	D	D		F	D	B	E	C	
Approach Delay (s)		123.7			52.4			25.8			40.4	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	46.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	88.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2954	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2954	1399				3433		1583
Volume (vph)	142	429	603	0	569	1966	0	0	0	947	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	2069	0	0	0	997	0	361
RTOR Reduction (vph)	0	224	0	0	212	0	0	0	0	0	0	201
Lane Group Flow (vph)	149	863	0	0	1173	1283	0	0	0	997	0	160
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.3			43.3	110.0				34.2		34.2
Effective Green, g (s)	20.0	67.3			43.3	110.0				34.7		34.7
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1976			1163	1399				1083		499
v/s Ratio Prot	0.08	0.27			c0.40							0.10
v/s Ratio Perm						c0.92				0.29		
v/c Ratio	0.46	0.44			1.04dr	0.92				0.92		0.32
Uniform Delay, d1	40.2	11.3			33.4	0.0				36.3		28.7
Progression Factor	1.00	1.00			0.68	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			10.1	1.2				12.5		0.3
Delay (s)	40.6	12.0			32.8	1.2				48.8		28.9
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.5			17.6			0.0			43.5	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	83.8%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1511	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1511	659			
Volume (vph)	153	1221	0	0	1932	470	603	226	1184	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1221	0	0	1932	470	603	226	1184	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	277	0	86	10	0	0	0
Lane Group Flow (vph)	153	1221	0	0	1932	193	603	732	582	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	508	335			
v/s Ratio Prot	0.09	c0.34			c0.42		0.36	0.48	c0.88			
v/s Ratio Perm						0.14						
v/c Ratio	0.45	0.82			1.15	0.39	1.07	1.44	1.74			
Uniform Delay, d1	39.4	28.3			35.0	26.0	36.5	36.5	27.0			
Progression Factor	1.53	0.39			0.93	1.30	1.00	1.00	1.00			
Incremental Delay, d2	2.7	3.3			68.3	0.9	57.1	209.7	343.6			
Delay (s)	63.2	14.4			100.7	34.8	93.6	246.2	370.6			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		19.8			87.8			237.1			0.0	
Approach LOS		B			F			F			A	

Intersection Summary				
HCM Average Control Delay	123.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1807	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1807	2628
Volume (vph)	469	1191	745	325	1274	283	132	16	66	261	163	888
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	469	1191	745	325	1274	283	132	16	66	261	163	888
RTOR Reduction (vph)	0	0	143	0	0	30	0	0	58	0	0	92
Lane Group Flow (vph)	469	1191	602	325	1274	253	72	76	8	0	424	796
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.14	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.23	0.30
v/s Ratio Perm						0.16			0.01			
v/c Ratio	0.88	1.17	1.07	1.19	1.20	0.53	0.34	0.35	0.04		0.86	0.71
Uniform Delay, d1	45.5	38.5	29.5	46.5	38.5	32.1	43.8	43.8	42.1		38.0	25.9
Progression Factor	1.20	1.02	1.07	1.08	1.09	1.15	1.02	1.02	2.08		1.01	0.75
Incremental Delay, d2	2.2	78.1	33.8	107.5	96.7	3.1	0.7	0.7	0.1		15.4	3.3
Delay (s)	57.0	117.2	65.5	157.6	138.5	40.0	45.5	45.6	87.7		53.9	22.8
Level of Service	E	F	E	F	F	D	D	D	F		D	C
Approach Delay (s)		89.4			127.0			58.5			32.8	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	87.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	788	0	0	0	0	1158	25	0	331	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1219	26	0	348	0
RTOR Reduction (vph)	0	0	170	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	659	0	0	0	0	1244	0	0	348	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.24					c0.35			0.19	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.39					0.60			0.57	
Uniform Delay, d1	25.4	25.4	11.5					14.5			30.6	
Progression Factor	1.22	1.20	1.58					1.00			1.31	
Incremental Delay, d2	0.7	0.3	0.1					1.3			3.7	
Delay (s)	31.8	30.8	18.3					15.8			43.7	
Level of Service	C	C	B					B			D	
Approach Delay (s)		21.7			0.0			15.8			43.7	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3359		1770	3480		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3359		1770	3480		1770	1849		1770	1863	1540
Volume (vph)	206	847	294	23	757	59	564	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	892	309	24	797	62	594	633	28	73	314	158
RTOR Reduction (vph)	0	30	0	0	6	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1171	0	24	853	0	594	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	904		55	728		624	652		357	376	311
v/s Ratio Prot	0.12	c0.35		0.01	c0.25		0.34	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.30		0.44	1.17		0.95	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		34.7	35.6		36.5	42.1	35.8
Progression Factor	1.24	1.04		1.00	1.00		1.08	1.08		1.23	1.18	2.42
Incremental Delay, d2	186.6	139.8		5.5	91.8		22.9	36.4		0.2	13.0	0.1
Delay (s)	248.9	181.4		57.8	135.3		60.4	74.7		45.2	62.8	86.6
Level of Service	F	F		E	F		E	E		D	E	F
Approach Delay (s)		191.8			133.2			67.9			67.4	
Approach LOS		F			F			E			E	

Intersection Summary					
HCM Average Control Delay	124.7	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.05				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	97.1%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3430		1770	3485		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3430		1770	3485		1770	3494		1770	3481	
Volume (vph)	181	733	189	106	530	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	772	199	112	558	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	25	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	946	0	112	612	0	195	1585	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.4		8.4	22.8		13.1	31.3		9.9	28.1	
Effective Green, g (s)	10.0	25.9		7.4	23.3		12.1	31.8		8.9	28.6	
Actuated g/C Ratio	0.11	0.29		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	987		146	902		238	1235		175	1106	
v/s Ratio Prot	c0.11	c0.28		0.06	0.18		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.96		0.77	0.68		0.82	1.28		0.67	1.31	
Uniform Delay, d1	39.8	31.5		40.5	30.0		37.9	29.1		39.2	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	19.1		21.1	2.0		19.3	133.8		9.8	146.4	
Delay (s)	94.5	50.7		61.6	32.0		57.2	162.9		49.0	177.1	
Level of Service	F	D		E	C		E	F		D	F	
Approach Delay (s)		57.9			36.5			151.3			167.5	
Approach LOS		E			D			F			F	

Intersection Summary					
HCM Average Control Delay	119.5	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.12				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	94.7%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3389		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3389		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	715	230	158	764	107	266	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	753	242	166	804	113	280	362	178	273	418	20
RTOR Reduction (vph)	0	31	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	964	0	166	804	29	280	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	779		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.28		c0.09	c0.23		0.16	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.24		1.34	0.87	0.07	0.59	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.3	27.8	31.7	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	117.9		196.8	11.0	0.4	1.5	73.9			212.2	
Delay (s)	50.8	156.4		243.3	46.3	28.2	33.2	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		153.0			74.6			84.0			248.7	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	132.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3539	1494	1770	1863	1520	1770	1833	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3455		1770	3539	1494	1770	1863	1520	1770	1833	
Volume (vph)	46	928	137	143	794	260	222	392	133	327	582	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	144	151	836	274	234	413	140	344	613	54
RTOR Reduction (vph)	0	12	0	0	0	169	0	0	99	0	3	0
Lane Group Flow (vph)	48	1109	0	151	836	105	234	413	41	344	664	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.5	29.5	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1088		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.19	c0.36	
v/s Ratio Perm						0.07			0.03			
v/c Ratio	0.56	1.02		0.74	0.62	0.18	1.10	0.76	0.09	1.62	1.25	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.5	44.0	32.4	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.95	
Incremental Delay, d2	6.8	32.3		12.8	2.1	0.7	92.4	6.1	0.1	290.8	119.7	
Delay (s)	53.4	66.6		55.6	27.1	21.2	136.4	38.5	26.0	332.8	153.5	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		66.0			29.3			65.4			214.5	
Approach LOS		E			C			E			F	

Intersection Summary			
HCM Average Control Delay	90.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1312	44	96	1216	13	33	12	98	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1381	46	101	1280	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1294			1427			2306	2946	714	2335	2963	647
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1294			1427			2306	2946	714	2335	2963	647
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			79			0	0	72	0	21	98
cM capacity (veh/h)	532			472			6	11	374	0	11	414

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	921	507	101	853	440	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	532	1700	1700	472	1700	1700	6	128	0
Volume to Capacity	0.04	0.54	0.30	0.21	0.50	0.26	6.56	0.86	Err
Queue Length 95th (ft)	3	0	0	20	0	0	Err	134	Err
Control Delay (s)	12.1	0.0	0.0	14.7	0.0	0.0	Err	109.6	Err
Lane LOS	B			B			F	F	F
Approach Delay (s)	0.2			1.1			2806.7		Err
Approach LOS							F		F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3423		1770	3495			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3423		1770	3495			1814	1555		1814	
Volume (vph)	32	1205	216	158	1050	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1268	227	166	1105	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	13	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1482	0	166	1165	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1095		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.43		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.35		0.78	0.93			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	30.9			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.59			1.00	1.00		1.00	
Incremental Delay, d2	0.6	165.1		1.7	1.7			101.1	0.6		10.7	
Delay (s)	43.6	199.1		52.0	19.9			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		195.7			23.9			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary				
HCM Average Control Delay	108.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	105.2%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3308		1770	3393		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3308		1770	3393		3433	3532		1770	3482	
Volume (vph)	223	862	439	47	608	187	548	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	907	462	49	640	197	577	1415	16	298	1511	123
RTOR Reduction (vph)	0	63	0	0	29	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1306	0	49	808	0	577	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		5.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	956		81	645		446	1286		250	1306	
v/s Ratio Prot	c0.13	c0.39		0.03	0.24		0.17	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.37		0.60	1.25		1.29	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.60	0.91		0.97	0.97		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	165.6		7.5	124.8		148.0	61.8		118.9	117.4	
Delay (s)	30.4	197.9		53.0	163.9		191.5	93.6		161.8	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		173.4			157.8			121.8			150.7	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	148.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.20			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	114.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3461			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3461			3110			2395	
Volume (vph)	47	997	17	45	677	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1049	18	47	713	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	18	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1065	0	47	799	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1793			603			465	
v/s Ratio Prot	c0.03	c0.30		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.58		0.58	0.45			0.62			0.82	
Uniform Delay, d1	23.3	8.3		23.4	7.6			18.4			19.3	
Progression Factor	1.03	1.41		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.8			1.9			11.2	
Delay (s)	24.5	11.8		30.0	8.4			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.3			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	15.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.94			0.96			0.90	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1770	1833			1734			1768			1667	
Flt Permitted	0.28	1.00			0.87			0.90			0.88	
Satd. Flow (perm)	518	1833			1537			1604			1490	
Volume (vph)	567	95	11	86	105	140	19	83	50	167	59	541
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	597	100	12	91	111	147	20	87	53	176	62	569
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	96	0
Lane Group Flow (vph)	597	107	0	0	320	0	0	140	0	0	711	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			731			679	
v/s Ratio Prot	c0.26	0.06										
v/s Ratio Perm	c0.27				0.21			0.09			c0.48	
v/c Ratio	1.16	0.13			1.10			0.19			1.05	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	92.5	0.1			83.2			0.1			47.6	
Delay (s)	113.7	14.2			119.7			14.7			72.1	
Level of Service	F	B			F			B			E	
Approach Delay (s)		98.0			119.7			14.7			72.1	
Approach LOS		F			F			B			E	

Intersection Summary					
HCM Average Control Delay	84.8	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.09				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	117.7%	ICU Level of Service		H	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00			0.97	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1760			1801	1583		1787			1805	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.97	
Satd. Flow (perm)	1770	1760			1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	748	0	0	574	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	17.6	17.6			8.5	8.5		31.5			31.5	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary					
HCM Average Control Delay	86.1	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.11				
Actuated Cycle Length (s)	66.6	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	110.6%	ICU Level of Service		H	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	216	36	0	1628	92	0	1817	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1714	97	0	1913	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1807	0	0	2025	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.51			c0.58	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.92			1.03	
Uniform Delay, d1		43.5			42.5			20.8			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			8.2			27.5	
Delay (s)		120.0			47.1			29.0			50.5	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			29.0			50.5	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	49.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2545			5077	
Volume (vph)	0	0	0	64	561	803	49	1118	0	0	1836	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	591	845	52	1177	0	0	1933	22
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	786	0	1229	0	0	1954	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1555			3103	
v/s Ratio Prot					0.19						0.38	
v/s Ratio Perm						c0.50		c0.48				
v/c Ratio					0.62	1.66		0.79			0.63	
Uniform Delay, d1					27.1	31.5		13.2			11.1	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	304.1		4.2			1.0	
Delay (s)					27.9	335.6		17.3			12.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			200.9			17.3			12.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	74.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3504		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3504		3433	3539	
Volume (vph)	28	861	78	0	0	0	0	1085	78	927	1009	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1142	82	976	1062	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1219	0	976	1062	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						38.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.35		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2381	
v/s Ratio Prot		c0.29						c0.35		c0.28	0.30	
v/s Ratio Perm												
v/c Ratio		1.14						0.98		1.01	0.45	
Uniform Delay, d1		41.0						35.1		39.5	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						21.6		31.2	0.0	
Delay (s)		116.5						56.7		70.7	8.5	
Level of Service		F						E		E	A	
Approach Delay (s)		116.5			0.0			56.7			38.3	
Approach LOS		F			A			E			D	

Intersection Summary				
HCM Average Control Delay	62.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	197	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	214	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	549	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	549	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	80	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	329	531	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	217	12
Volume Left	0	153	0	1
Volume Right	0	1	214	3
cSH	1604	1605	1051	578
Volume to Capacity	0.00	0.10	0.21	0.02
Queue Length 95th (ft)	0	8	19	2
Control Delay (s)	0.0	6.9	9.3	11.4
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.3	11.4
Approach LOS			A	B

Intersection Summary				
Average Delay	8.1			
Intersection Capacity Utilization	34.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 3 Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	132	46	13	225	67	256	13	422	300	90	804	75	83	29	43	80	225	16

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	191	548	735	969	112	123	241
Delay	110.1	7.9	108.0	62.2	1.8	76.5	98.7
LOS	F	A	F	E	A	E	F

HCM Average Control Delay	**85.8**
HCM Level of Service	**F**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1860	1583	1770	1839	
Flt Permitted	0.95	1.00		0.95	1.00			0.50	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1641			934	1583	1770	1839	
Volume (vph)	132	46	13	225	67	256	13	422	300	90	804	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	50	14	245	73	278	14	459	326	98	874	82
RTOR Reduction (vph)	0	8	0	0	110	0	0	0	193	0	3	0
Lane Group Flow (vph)	143	56	0	245	241	0	0	473	133	98	953	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	10.0	10.0		38.3	38.3			50.7	50.7	9.3	64.0	
Effective Green, g (s)	10.0	10.0		38.3	38.3			50.7	50.7	9.3	64.0	
Actuated g/C Ratio	0.08	0.08		0.31	0.31			0.41	0.41	0.07	0.51	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	142	145		545	506			381	646	132	947	
v/s Ratio Prot	c0.08	0.03		0.14	c0.15					0.06	c0.52	
v/s Ratio Perm								c0.51	0.08			
v/c Ratio	1.01	0.38		0.45	0.48			1.24	0.21	0.74	1.01	
Uniform Delay, d1	57.1	54.2		34.5	34.9			36.8	23.8	56.3	30.1	
Progression Factor	1.00	1.00		0.39	0.11			1.00	1.00	1.00	1.00	
Incremental Delay, d2	77.4	1.2		0.2	0.2			129.1	0.1	17.7	30.8	
Delay (s)	134.5	55.5		13.6	4.0			165.9	23.9	74.1	61.0	
Level of Service	F	E		B	A			F	C	E	E	
Approach Delay (s)		110.1			7.9			108.0			62.2	
Approach LOS		F			A			F			E	

Intersection Summary			
HCM Average Control Delay	67.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	124.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Alt#3 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1823		1770	1863	1764	
Flt Permitted	1.00		0.26	1.00	0.96	
Satd. Flow (perm)	1823		487	1863	1764	
Volume (vph)	155	29	43	169	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	32	47	184	245	17
RTOR Reduction (vph)	5	0	0	0	2	0
Lane Group Flow (vph)	195	0	47	184	260	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	97.3		15.3	15.3	19.0	
Effective Green, g (s)	97.3		15.3	15.3	19.0	
Actuated g/C Ratio	0.78		0.12	0.12	0.15	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1427		60	229	270	
v/s Ratio Prot	c0.11			c0.10	c0.15	
v/s Ratio Perm			0.10			
v/c Ratio	0.14		0.78	0.80	0.96	
Uniform Delay, d1	3.3		52.9	53.0	52.3	
Progression Factor	0.55		1.00	1.00	1.00	
Incremental Delay, d2	0.0		46.2	17.7	44.4	
Delay (s)	1.8		99.1	70.7	96.7	
Level of Service	A		F	E	F	
Approach Delay (s)	1.8			76.5	96.7	
Approach LOS	A			E	F	

Intersection Summary			
HCM Average Control Delay	62.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	124.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	181	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	197	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	295	133
Volume Left (vph)	0	108	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.11	-0.15	0.04
Departure Headway (s)	4.6	5.0	4.3	4.6
Degree Utilization, x	0.02	0.18	0.35	0.17
Capacity (veh/h)	695	662	810	734
Control Delay (s)	7.7	9.1	9.6	8.6
Approach Delay (s)	7.7	9.1	9.6	8.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay			9.2	
HCM Level of Service			A	
Intersection Capacity Utilization		37.5%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2030 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	130	36	28	647	871	179
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	39	30	703	947	195
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.48	0.48	0.48			
vC, conflicting volume	1808	1044	1141			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2679	1091	1293			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	69	88			
cM capacity (veh/h)	10	126	258			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	180	30	703	1141
Volume Left	141	30	0	0
Volume Right	39	0	0	195
cSH	13	258	1700	1700
Volume to Capacity	13.98	0.12	0.41	0.67
Queue Length 95th (ft)	Err	10	0	0
Control Delay (s)	Err	20.8	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	0.9		0.0
Approach LOS	F			

Intersection Summary				
Average Delay		878.1		
Intersection Capacity Utilization		72.8%	ICU Level of Service	C
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave — 2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1645		1770	3539	1488		3485	
Flt Permitted		0.97	1.00	0.95	0.97		0.17	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1645		311	3539	1488		3240	
Volume (vph)	31	22	136	874	78	72	143	383	379	25	635	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	950	85	78	155	416	412	27	690	68
RTOR Reduction (vph)	0	0	33	0	6	0	0	0	270	0	6	0
Lane Group Flow (vph)	0	58	115	576	531	0	155	416	142	0	779	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	38.7	38.7		35.3	35.3	35.3		35.3	
Effective Green, g (s)		24.5	24.5	38.7	38.7		34.8	34.8	34.8		34.8	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.32	0.32	0.32		0.32	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	591	579		98	1120	471		1025	
v/s Ratio Prot		0.03		c0.34	0.32			0.12				
v/s Ratio Perm			c0.07				c0.50		0.10		0.24	
v/c Ratio		0.14	0.33	0.97	0.92		1.58	0.37	0.30		0.76	
Uniform Delay, d1		34.3	35.8	35.2	34.1		37.6	29.1	28.4		33.8	
Progression Factor		1.00	1.00	0.57	0.56		0.58	0.58	0.34		1.00	
Incremental Delay, d2		0.7	2.5	27.8	17.3		290.5	0.6	1.1		5.3	
Delay (s)		35.1	38.3	48.0	36.5		312.4	17.4	10.8		39.1	
Level of Service		D	D	D	D		F	B	B		D	
Approach Delay (s)		37.4			42.5			61.2			39.1	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	47.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St — 2030 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	343	67	691	927	412	348
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	373	73	751	1008	448	378
RTOR Reduction (vph)	0	35	0	0	0	20
Lane Group Flow (vph)	373	38	751	1008	448	358
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	26.1	57.9	28.3	76.9	45.1	74.7
Effective Green, g (s)	25.6	57.4	27.8	76.4	44.6	74.2
Actuated g/C Ratio	0.23	0.52	0.25	0.69	0.41	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	412	826	868	1294	755	1068
v/s Ratio Prot	c0.21	0.02	c0.22	c0.54	0.24	0.23
v/s Ratio Perm						
v/c Ratio	0.91	0.05	0.87	0.78	0.59	0.34
Uniform Delay, d1	41.0	12.9	39.3	11.2	25.6	7.5
Progression Factor	0.61	0.51	0.56	1.88	1.00	1.00
Incremental Delay, d2	20.2	0.0	4.4	2.2	3.4	0.2
Delay (s)	45.3	6.6	26.5	23.2	29.0	7.7
Level of Service	D	A	C	C	C	A
Approach Delay (s)	39.0			24.6	19.3	
Approach LOS	D			C	B	

Intersection Summary				
HCM Average Control Delay	25.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Volume (vph)	26	21	7	833	13	16	41	340	1318	135	485	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	905	14	17	45	370	1433	147	527	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	475	460	0	45	370	1433	147	559	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	661	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.10		0.08	0.30	
v/s Ratio Perm			0.00						c0.91			
v/c Ratio	0.38	0.30	0.01	0.83	0.81		0.53	0.35	0.91	0.75	0.85	
Uniform Delay, d1	35.2	35.1	34.7	22.9	22.6		35.1	20.8	0.0	32.6	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	9.9	7.9		2.7	0.1	9.0	13.6	9.6	
Delay (s)	36.4	35.9	34.7	32.8	30.5		37.8	21.0	9.0	46.2	31.8	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			31.7			12.1			34.8	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	72.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

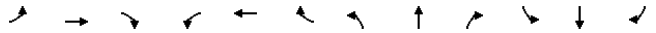
HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			2988	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			2988	1399				3433		1583
Volume (vph)	115	309	31	0	418	1595	0	0	0	1078	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1734	0	0	0	1172	0	282
RTOR Reduction (vph)	0	6	0	0	147	0	0	0	0	0	0	150
Lane Group Flow (vph)	125	364	0	0	803	1238	0	0	0	1172	0	132
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	59.5			44.1	110.0				42.0		42.0
Effective Green, g (s)	11.4	59.5			44.1	110.0				42.5		42.5
Actuated g/C Ratio	0.10	0.54			0.40	1.00				0.39		0.39
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1888			1198	1399				1326		612
v/s Ratio Prot	0.07	0.10			0.27							0.08
v/s Ratio Perm						c0.88				0.34		
v/c Ratio	0.68	0.19			0.67	0.88				0.88		0.22
Uniform Delay, d1	47.6	12.9			27.0	0.0				31.5		22.6
Progression Factor	1.00	1.00			0.97	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.9				7.3		0.1
Delay (s)	55.7	13.2			27.1	2.9				38.7		22.7
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.9			13.4			0.0			35.6	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#3 SAT



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	123	1263	0	0	1586	487	427	21	1401	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1373	0	0	1724	529	464	23	1523	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	340	0	161	2	0	0	0
Lane Group Flow (vph)	134	1373	0	0	1724	189	464	623	760	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.39			0.37		0.28	0.43	c1.15			
v/s Ratio Perm						0.13						
v/c Ratio	0.77	1.15			1.04	0.36	0.63	0.99	1.95			
Uniform Delay, d1	48.4	36.5			35.4	26.2	24.1	30.7	22.5			
Progression Factor	1.20	0.62			0.98	1.31	1.00	1.00	1.00			
Incremental Delay, d2	14.0	74.4			28.2	1.0	4.1	32.4	438.9			
Delay (s)	72.2	96.9			63.0	35.2	28.2	63.1	461.4			
Level of Service	E	F			E	D	C	E	F			
Approach Delay (s)		94.7			56.5			206.0			0.0	
Approach LOS		F			E			F			A	

Intersection Summary			
HCM Average Control Delay	118.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1815	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1815	2628
Volume (vph)	495	946	1230	350	751	295	227	62	101	297	270	1090
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	538	1028	1337	380	816	321	247	67	110	323	293	1185
RTOR Reduction (vph)	0	50	85	0	0	78	0	0	98	0	0	27
Lane Group Flow (vph)	538	1488	742	380	816	243	153	161	12	0	616	1158
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.16	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.34	0.44
v/s Ratio Perm						0.16			0.01			
v/c Ratio	0.91	1.48	1.42	1.39	0.77	0.53	0.84	0.86	0.07		1.24	0.91
Uniform Delay, d1	44.6	37.5	31.5	46.5	35.0	32.1	48.0	48.2	44.0		40.0	26.4
Progression Factor	1.21	1.03	1.05	1.00	1.00	1.00	1.26	1.26	2.47		0.92	0.77
Incremental Delay, d2	2.5	214.9	191.6	195.1	5.3	4.4	23.7	26.6	0.1		119.2	7.0
Delay (s)	56.6	253.3	224.8	241.6	40.4	36.4	84.3	87.3	108.7		156.2	27.2
Level of Service	E	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		208.8			89.9			91.8			71.3	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	136.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1598	21	0	473	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1737	23	0	514	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1759	0	0	514	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.50			0.28	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.94			0.60	
Uniform Delay, d1	21.7	21.7	25.2					24.5			22.2	
Progression Factor	1.04	1.04	1.10					0.55			0.59	
Incremental Delay, d2	0.7	0.3	3.5					8.2			2.7	
Delay (s)	23.1	23.0	31.2					21.7			15.9	
Level of Service	C	C	C					C			B	
Approach Delay (s)		29.0			0.0			21.7			15.9	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3334		1770	3508		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3334		1770	3508		1770	1839		1770	1863	1549
Volume (vph)	101	694	384	40	755	38	330	288	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	754	417	43	821	41	359	313	24	40	308	107
RTOR Reduction (vph)	0	103	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1068	0	43	857	0	359	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.5		2.3	17.8		15.2	15.2		14.2	14.2	14.2
Effective Green, g (s)	4.0	19.5		2.3	17.8		15.2	15.2		14.2	14.2	14.2
Actuated g/C Ratio	0.06	0.29		0.03	0.26		0.23	0.23		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	105	967		61	929		400	416		374	394	327
v/s Ratio Prot	c0.06	c0.32		0.02	0.24		c0.20	0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.05	1.10		0.70	0.92		0.90	0.80		0.11	0.78	0.07
Uniform Delay, d1	31.6	23.8		32.1	24.0		25.2	24.6		21.4	25.0	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	101.2	62.0		30.9	14.3		22.0	10.6		0.1	9.7	0.1
Delay (s)	132.8	85.8		63.0	38.3		47.2	35.1		21.5	34.7	21.3
Level of Service	F	F		E	D		D	D		C	C	C
Approach Delay (s)		89.9			39.5			41.4			30.4	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM Average Control Delay	58.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3422		1770	3521			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3422		1770	3521			1809	1555		1785	
Volume (vph)	19	1250	226	175	1344	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1359	246	190	1461	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1592	0	190	1495	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1228		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.47		0.11	c0.42			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.30		0.97	0.93			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	25.4			37.8	31.0		39.8	
Progression Factor	0.94	0.73		0.81	0.69			1.00	1.00		1.00	
Incremental Delay, d2	238.0	139.4		12.7	1.2			59.1	0.4		0.6	
Delay (s)	284.4	162.7		48.7	18.8			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		164.3			22.2			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	88.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3077		1770	3387		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3077		1770	3387		3433	3516		1770	3354	
Volume (vph)	192	788	484	72	681	109	635	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	857	526	78	740	118	690	1205	27	170	1276	228
RTOR Reduction (vph)	0	92	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1291	0	78	845	0	690	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	994		83	806		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.42		0.04	0.25		c0.20	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.30		0.94	1.05		1.26	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.35	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	135.1		77.0	45.1		129.9	25.6		18.3	200.1	
Delay (s)	62.1	144.4		124.5	83.2		171.9	58.1		61.1	234.6	
Level of Service	E	F		F	F		F	E		E	F	
Approach Delay (s)		133.6			86.7			98.9			217.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	138.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.33			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	115.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #4
BASE YEAR

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3387		1770	3522		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3387		1770	3522		1770	3436		1770	1863	1583
Volume (vph)	500	775	313	102	616	20	91	176	42	59	193	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	340	111	670	22	99	191	46	64	210	202
RTOR Reduction (vph)	0	34	0	0	2	0	0	20	0	0	0	172
Lane Group Flow (vph)	543	1148	0	111	690	0	99	217	0	64	210	30
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	54.3		10.8	30.5		11.6	11.6		16.3	16.3	16.3
Effective Green, g (s)	34.6	55.3		10.8	31.5		11.6	11.6		16.3	16.3	16.3
Actuated g/C Ratio	0.31	0.50		0.10	0.29		0.11	0.11		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1703		174	1009		187	362		262	276	235
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.06	c0.06		0.04	c0.11	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.67		0.64	0.68		0.53	0.60		0.24	0.76	0.13
Uniform Delay, d1	37.3	20.6		47.7	34.8		46.6	47.0		41.4	45.0	40.7
Progression Factor	1.00	1.00		0.79	1.38		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.2		5.6	2.8		2.1	2.4		0.5	11.7	0.2
Delay (s)	68.8	22.7		43.4	51.0		48.7	49.3		41.9	56.7	40.9
Level of Service	E	C		D	D		D	D		D	E	D
Approach Delay (s)		37.2			49.9			49.1			48.0	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	43.0	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.78				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	73.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3443		1770	3495		1770	3470	
Flt Permitted	0.21	1.00			0.62		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	390	3458			2158		1770	3495		1770	3470	
Volume (vph)	70	670	121	70	521	103	130	507	46	113	660	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	76	566	112	141	551	50	123	717	108
RTOR Reduction (vph)	0	16	0	0	15	0	0	5	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	739	0	141	596	0	123	816	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	38.2	38.2			38.2		13.2	42.8		16.0	45.6	
Effective Green, g (s)	38.2	38.2			38.2		13.2	43.8		16.0	46.6	
Actuated g/C Ratio	0.35	0.35			0.35		0.12	0.40		0.15	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	135	1201			749		212	1392		257	1470	
v/s Ratio Prot		0.24					c0.08	0.17		0.07	c0.24	
v/s Ratio Perm	0.19				c0.34							
v/c Ratio	0.56	0.70			0.99		0.67	0.43		0.48	0.55	
Uniform Delay, d1	29.1	31.0			35.6		46.3	24.0		43.2	23.9	
Progression Factor	0.44	0.51			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	1.5			29.3		7.6	1.0		1.4	1.5	
Delay (s)	16.8	17.4			64.9		53.9	25.0		44.6	25.4	
Level of Service	B	B			E		D	C		D	C	
Approach Delay (s)		17.3			64.9			30.5			27.9	
Approach LOS		B			E			C			C	

Intersection Summary				
HCM Average Control Delay	33.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	77	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	84	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	316	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	316	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	92	100	100	100
cM capacity (veh/h)	1542			1616			693	633	1079	564	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	86	1
Volume Left	0	84	2	0
Volume Right	2	1	84	0
cSH	1542	1616	1064	633
Volume to Capacity	0.00	0.05	0.08	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.7
Approach LOS			A	B

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	57	46	5	136	47	36	11	108	81	105	305	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	50	5	148	51	39	12	117	88	114	332	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	62	55	148	90	217	114	429
Volume Left (vph)	62	0	148	0	12	114	0
Volume Right (vph)	0	5	0	39	88	0	98
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.20	0.53	-0.13
Departure Headway (s)	7.7	7.1	7.4	6.6	6.2	6.6	5.9
Degree Utilization, x	0.13	0.11	0.30	0.16	0.38	0.21	0.70
Capacity (veh/h)	426	458	454	506	550	530	590
Control Delay (s)	10.6	9.7	12.4	9.7	12.9	10.1	20.4
Approach Delay (s)	10.2		11.4		12.9	18.2	
Approach LOS	B		B		B	C	

Intersection Summary				
Delay	14.9			
HCM Level of Service	B			
Intersection Capacity Utilization	57.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	232	0	0	219	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	252	0	0	238	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			252		490	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			252		490	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1313		537	786

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	252	238	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1313	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1718			1829		1770	1850		1770	1816	
Flt Permitted		0.93			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1608			1492		1770	1850		1770	1816	
Volume (vph)	52	75	132	37	86	4	36	271	13	23	385	76
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	82	143	40	93	4	39	295	14	25	418	83
RTOR Reduction (vph)	0	74	0	0	2	0	0	3	0	0	12	0
Lane Group Flow (vph)	0	208	0	0	135	0	39	306	0	25	489	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		322			298		85	1003		32	930	
v/s Ratio Prot							c0.02	0.17		0.01	c0.27	
v/s Ratio Perm		c0.13			0.09							
v/c Ratio		0.64			0.45		0.46	0.31		0.78	0.53	
Uniform Delay, d1		18.4			17.6		23.2	6.3		24.5	8.1	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		3.9			0.8		2.8	0.8		72.6	2.1	
Delay (s)		22.3			18.4		23.6	8.4		97.1	10.3	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		22.3			18.4			10.1			14.4	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	76	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	83	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	142	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.08	0.00
Departure Headway (s)	4.2	4.6	4.2	4.3
Degree Utilization, x	0.01	0.12	0.16	0.11
Capacity (veh/h)	795	737	837	812
Control Delay (s)	7.3	8.2	8.0	7.8
Approach Delay (s)	7.3	8.2	8.0	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
HCM Level of Service	A		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	37	22	29	179	352	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	24	32	195	383	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	691	434	485			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	691	434	485			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	96	97			
cM capacity (veh/h)	398	622	1078			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	64	32	195	485
Volume Left	40	32	0	0
Volume Right	24	0	0	102
cSH	460	1078	1700	1700
Volume to Capacity	0.14	0.03	0.11	0.29
Queue Length 95th (ft)	12	2	0	0
Control Delay (s)	14.1	8.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.1	1.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3415		3539	1583		3531
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3415		3539	1583		3279
Volume (vph)	371	30	406	391	17	329
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	403	33	441	425	18	358
RTOR Reduction (vph)	6	0	0	230	0	0
Lane Group Flow (vph)	430	0	441	196	0	376
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1571		1628	728		1508
v/s Ratio Prot	c0.13		c0.12			
v/s Ratio Perm				0.12		0.11
v/c Ratio	0.27		0.27	0.27		0.25
Uniform Delay, d1	16.7		16.7	16.6		16.5
Progression Factor	0.69		0.14	2.82		1.00
Incremental Delay, d2	0.4		0.1	0.3		0.4
Delay (s)	12.0		2.4	47.2		16.9
Level of Service	B		A	D		B
Approach Delay (s)	12.0		24.4			16.9
Approach LOS	B		C			B

Intersection Summary					
HCM Average Control Delay	19.5	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.27				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A		
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	348	15	223	214	81	226
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	378	16	242	233	88	246
RTOR Reduction (vph)	0	10	0	0	0	194
Lane Group Flow (vph)	378	6	242	233	88	52
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	21.5	38.1	13.1	71.5	54.9	21.5
Effective Green, g (s)	21.0	37.6	12.6	71.0	54.4	21.0
Actuated g/C Ratio	0.21	0.38	0.13	0.71	0.54	0.21
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	595	433	1323	1013	332
v/s Ratio Prot	c0.21	0.00	c0.07	c0.13	0.05	0.03
v/s Ratio Perm						
v/c Ratio	1.02	0.01	0.56	0.18	0.09	0.16
Uniform Delay, d1	39.5	19.5	41.1	4.8	10.9	32.3
Progression Factor	1.10	2.66	0.62	0.27	1.00	1.00
Incremental Delay, d2	48.8	0.0	1.5	0.3	0.2	0.2
Delay (s)	92.1	52.0	27.0	1.6	11.1	32.5
Level of Service	F	D	C	A	B	C
Approach Delay (s)	90.5			14.5	26.8	
Approach LOS	F			B	C	

Intersection Summary				
HCM Average Control Delay	42.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	39.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1797	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1797	
Volume (vph)	5	21	16	671	79	0	88	39	734	60	231	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	729	86	0	96	42	798	65	251	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	5	23	1	397	418	0	96	42	798	65	316	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.8	2.8	2.8	23.3	23.3		4.7	16.6	62.2	4.0	15.9	
Effective Green, g (s)	2.3	2.3	2.3	23.3	23.3		4.2	17.1	62.2	3.5	16.4	
Actuated g/C Ratio	0.04	0.04	0.04	0.37	0.37		0.07	0.27	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	65	69	59	630	638		120	973	1583	100	474	
v/s Ratio Prot	0.00	0.01		0.24	c0.25		0.05	0.01		0.04	c0.18	
v/s Ratio Perm			0.00						c0.50			
v/c Ratio	0.08	0.33	0.01	0.63	0.66		0.80	0.04	0.50	0.65	0.67	
Uniform Delay, d1	28.9	29.2	28.9	15.9	16.1		28.6	16.5	0.0	28.8	20.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.8	2.2		29.0	0.0	1.1	10.9	3.2	
Delay (s)	29.1	30.2	28.9	17.7	18.3		57.6	16.6	1.1	39.7	23.7	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		29.6			18.0			7.6			26.3	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	853	0	0	0	776	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	927	0	0	0	843	0	139
RTOR Reduction (vph)	0	75	0	0	0	0	0	0	0	0	0	99
Lane Group Flow (vph)	129	366	0	0	739	927	0	0	0	843	0	40
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	63.2			40.2	100.0				28.3		28.3
Effective Green, g (s)	19.0	63.2			40.2	100.0				28.8		28.8
Actuated g/C Ratio	0.19	0.63			0.40	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2081			1363	1441				989		456
v/s Ratio Prot	0.07	0.11			0.22					c0.25		
v/s Ratio Perm						c0.64						0.03
v/c Ratio	0.38	0.18			0.54	0.64				0.85		0.09
Uniform Delay, d1	35.4	7.6			22.9	0.0				33.6		26.0
Progression Factor	1.00	1.00			0.77	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.3				7.1		0.1
Delay (s)	35.7	7.8			18.5	1.3				40.7		26.1
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.1			8.9			0.0			38.6	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1457	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1457	1504			
Volume (vph)	74	919	0	0	944	296	589	2	1193	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	999	0	0	1026	322	640	2	1297	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	219	0	81	35	0	0	0
Lane Group Flow (vph)	80	999	0	0	1026	103	582	604	637	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	554	677			
v/s Ratio Prot	0.05	c0.20			c0.22		0.35	c0.41	c0.42			
v/s Ratio Perm						0.07						
v/c Ratio	0.25	0.42			0.69	0.20	0.91	1.09	0.94			
Uniform Delay, d1	35.2	17.5			29.7	24.7	29.4	31.0	26.2			
Progression Factor	0.66	0.49			0.60	0.38	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.5			2.3	0.8	17.5	65.3	21.4			
Delay (s)	24.8	9.1			20.0	10.2	46.9	96.3	47.6			
Level of Service	C	A			B	B	D	F	D			
Approach Delay (s)		10.3			17.6			64.6			0.0	
Approach LOS		B			B			E			A	

Intersection Summary			
HCM Average Control Delay	36.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1798	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1798	2628
Volume (vph)	688	1105	319	45	595	167	42	3	42	114	45	616
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	748	1201	347	49	647	182	46	3	46	124	49	670
RTOR Reduction (vph)	0	0	168	0	0	42	0	0	43	0	0	199
Lane Group Flow (vph)	748	1201	179	49	647	140	24	25	3	0	173	471
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.9	41.6	52.2	6.8	26.5	26.5	7.1	7.1	7.1		30.5	51.4
Effective Green, g (s)	20.4	41.1	51.7	6.3	27.0	27.0	6.6	6.6	6.6		30.0	50.4
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	700	1393	745	112	956	427	111	112	104		539	1325
v/s Ratio Prot	c0.22	c0.35	c0.12	0.03	c0.18		0.01	0.01			0.10	c0.18
v/s Ratio Perm						0.09			0.00			
v/c Ratio	1.07	0.86	0.24	0.44	0.68	0.33	0.22	0.22	0.03		0.32	0.36
Uniform Delay, d1	39.8	26.9	13.3	45.1	32.6	29.2	44.2	44.3	43.7		27.1	15.0
Progression Factor	1.13	0.59	0.40	0.74	0.69	0.61	1.00	1.00	1.00		1.06	1.91
Incremental Delay, d2	47.5	4.8	0.1	0.8	3.2	1.7	0.7	0.7	0.1		1.5	0.7
Delay (s)	92.3	20.7	5.4	34.5	25.6	19.6	45.0	45.0	43.8		30.3	29.4
Level of Service	F	C	A	C	C	B	D	D	D		C	C
Approach Delay (s)		41.7			24.9			44.4			29.6	
Approach LOS		D			C			D			C	

Intersection Summary				
HCM Average Control Delay	35.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3527			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3527			1863	
Volume (vph)	35	26	200	6	0	20	0	399	9	0	101	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	434	10	0	110	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	442	0	0	110	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	3				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1503			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.13			0.06	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.29			0.17	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.8			23.1	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.59	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.5			0.6	
Delay (s)	17.0	17.0	14.7	47.7		47.0		19.3			37.2	
Level of Service	B	B	B	D		D		B			D	
Approach Delay (s)		15.2			47.1			19.3			37.2	
Approach LOS		B			D			B			D	

Intersection Summary				
HCM Average Control Delay	21.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.18			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	28.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3326		1770	3473		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3326		1770	3473		1770	1827		1770	1863	1583
Volume (vph)	355	359	241	34	422	60	270	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	390	262	37	459	65	293	188	28	28	153	101
RTOR Reduction (vph)	0	92	0	0	11	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	560	0	37	513	0	293	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	28.3	45.1		5.7	22.5		20.7	20.7		13.5	13.5	13.5
Effective Green, g (s)	27.8	45.6		5.2	23.0		20.2	20.2		13.0	13.0	13.0
Actuated g/C Ratio	0.28	0.46		0.05	0.23		0.20	0.20		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	492	1517		92	799		358	369		230	242	206
v/s Ratio Prot	c0.22	0.17		0.02	c0.15		c0.17	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.78	0.37		0.40	0.64		0.82	0.57		0.12	0.63	0.06
Uniform Delay, d1	33.3	17.8		45.9	34.8		38.1	36.0		38.5	41.2	38.2
Progression Factor	0.63	0.77		1.00	1.00		0.98	0.97		0.86	0.90	1.15
Incremental Delay, d2	5.0	0.4		2.9	3.9		13.5	2.1		0.2	5.2	0.1
Delay (s)	26.0	14.2		48.8	38.7		50.7	37.0		33.3	42.2	43.8
Level of Service	C	B		D	D		D	D		C	D	D
Approach Delay (s)		18.6			39.4			44.9			41.9	
Approach LOS		B			D			D			D	

Intersection Summary					
HCM Average Control Delay	31.8	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	69.0%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3370		1770	3511		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3370		1770	3511		1770	3479		1770	3498	
Volume (vph)	68	190	89	89	400	22	103	447	57	49	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	207	97	97	435	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	63	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	241	0	97	454	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	14.9		9.0	17.5		11.4	53.9		7.2	49.7	
Effective Green, g (s)	5.4	15.4		8.0	18.0		10.4	54.4		6.2	50.2	
Actuated g/C Ratio	0.05	0.15		0.08	0.18		0.10	0.54		0.06	0.50	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	519		142	632		184	1893		110	1756	
v/s Ratio Prot	0.04	0.07		c0.05	c0.13		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.47		0.68	0.72		0.61	0.29		0.48	0.40	
Uniform Delay, d1	46.7	38.5		44.8	38.6		42.9	12.3		45.3	15.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.7		12.7	3.9		5.6	0.4		3.3	0.7	
Delay (s)	77.6	39.2		57.5	42.5		48.5	12.7		48.6	16.2	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		46.7			45.1			18.8			18.4	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM Average Control Delay	29.4	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3417		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	169	51	43	307	61	90	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	184	55	47	334	66	98	58	33	3	25	10
RTOR Reduction (vph)	0	16	0	0	0	28	0	25	0	0	9	0
Lane Group Flow (vph)	26	223	0	47	334	38	98	66	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	55.6		5.4	57.8	57.8	11.1	11.1			13.4	
Effective Green, g (s)	2.7	55.6		4.9	57.8	57.8	10.6	10.6			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.11	0.11			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1900		87	2046	915	188	187			231	
v/s Ratio Prot	0.01	0.07		c0.03	c0.09		c0.06	0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.12		0.54	0.16	0.04	0.52	0.35			0.13	
Uniform Delay, d1	48.0	10.5		46.4	9.8	9.1	42.3	41.5			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	2.0	0.8			0.2	
Delay (s)	57.5	10.7		51.8	10.0	9.2	44.3	42.4			38.7	
Level of Service	E	B		D	B	A	D	D			D	
Approach Delay (s)		15.3			14.3			43.4			38.7	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	21.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	34.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3425		1770	3539	1583	1770	1863	1583	1770	1842	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3425		1770	3539	1583	1770	1863	1583	1770	1842	
Volume (vph)	28	152	41	51	372	202	129	230	39	74	127	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	45	55	404	220	140	250	42	80	138	11
RTOR Reduction (vph)	0	19	0	0	0	110	0	0	34	0	3	0
Lane Group Flow (vph)	30	191	0	55	404	110	140	250	8	80	146	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	47.5		7.0	49.9	49.9	12.1	23.2	18.9	7.8	18.9	
Effective Green, g (s)	4.1	47.5		6.5	49.9	49.9	11.6	22.7	18.4	7.3	18.4	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.12	0.23	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1627		115	1766	790	205	423	291	129	339	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.08	c0.13		0.05	0.08	
v/s Ratio Perm						0.07			0.00			
v/c Ratio	0.41	0.12		0.48	0.23	0.14	0.68	0.59	0.03	0.62	0.43	
Uniform Delay, d1	46.8	14.6		45.1	14.2	13.5	42.4	34.5	33.5	45.0	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.08	0.91	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.4	8.3	1.9	0.0	7.7	0.6	
Delay (s)	49.5	14.7		47.4	14.5	13.9	50.7	36.4	33.5	56.2	33.6	
Level of Service	D	B		D	B	B	D	D	C	E	C	
Approach Delay (s)		19.1			16.9			40.7			41.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	27.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	223	16	90	599	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	242	17	98	651	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	674			260			827	1173	130	1119	1170	337
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	674			260			827	1173	130	1119	1170	337
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			88	92	91	98	98	100
cM capacity (veh/h)	913			1302			239	171	896	127	172	659

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	162	98	98	434	240	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	913	1700	1700	1302	1700	1700	222	668	173
Volume to Capacity	0.03	0.10	0.06	0.08	0.26	0.14	0.16	0.13	0.04
Queue Length 95th (ft)	2	0	0	6	0	0	14	11	3
Control Delay (s)	9.1	0.0	0.0	8.0	0.0	0.0	24.3	11.2	26.6
Lane LOS	A			A			C	B	D
Approach Delay (s)	0.8			1.0			15.0		26.6
Approach LOS							B		D

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	34.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3500		1770	3489			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3500		1770	3489			850	1583		1568	
Volume (vph)	3	269	21	69	514	53	85	66	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	292	23	75	559	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	311	0	75	612	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.49		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1726		122	1947			183	340		99	
v/s Ratio Prot	0.00	c0.09		c0.04	c0.18							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.18		0.61	0.31			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.1		45.3	11.8			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.03	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.1	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.3		52.9	7.4			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.4			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3389		1770	3379		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3389		1770	3379		3433	3533		1770	3500	
Volume (vph)	92	211	83	29	317	137	259	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	229	90	32	345	149	282	776	9	147	736	59
RTOR Reduction (vph)	0	49	0	0	50	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	270	0	32	444	0	282	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	18.1		9.1	18.4		15.0	47.4		12.4	44.8	
Effective Green, g (s)	7.8	17.1		8.1	17.4		14.0	47.4		11.4	44.8	
Actuated g/C Ratio	0.08	0.17		0.08	0.17		0.14	0.47		0.11	0.45	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	580		143	588		481	1675		202	1568	
v/s Ratio Prot	c0.06	0.08		0.02	c0.13		c0.08	0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.22	0.75		0.59	0.47		0.73	0.50	
Uniform Delay, d1	45.1	37.3		43.0	39.3		40.3	17.8		42.8	19.7	
Progression Factor	1.29	1.25		1.16	1.13		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.6	0.4		0.3	4.7		1.2	0.9		10.5	1.2	
Delay (s)	72.9	47.2		50.0	49.0		41.5	18.7		53.3	20.8	
Level of Service	E	D		D	D		D	B		D	C	
Approach Delay (s)		53.3			49.1			24.7			25.9	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	33.5	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.61				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3489		1770	3487			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3489		1770	3487			3189			2945	
Volume (vph)	48	282	29	6	412	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	307	32	7	448	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	327	0	7	484	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2045		21	1918			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.14							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.25			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.9			18.3			19.3	
Progression Factor	0.54	1.42		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.9	6.9		27.9	6.2			18.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.8			6.5			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary					
HCM Average Control Delay	11.8	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.34				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	142	50	2	8	67	26	2	1	2	16	4	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	54	2	9	73	28	2	1	2	17	4	95

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	154	57	110	5	116
Volume Left (vph)	154	0	9	2	17
Volume Right (vph)	0	2	28	2	95
Hadj (s)	0.53	0.01	-0.10	-0.13	-0.42
Departure Headway (s)	5.4	4.9	4.4	4.7	4.3
Degree Utilization, x	0.23	0.08	0.13	0.01	0.14
Capacity (veh/h)	642	715	777	707	785
Control Delay (s)	8.8	7.1	8.1	7.7	7.9
Approach Delay (s)	8.4		8.1	7.7	7.9
Approach LOS	A		A	A	A

Intersection Summary				
Delay	8.2			
HCM Level of Service	A			
Intersection Capacity Utilization	28.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.18	0.18			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	

Intersection Summary						
HCM Average Control Delay	23.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	45.6	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	36.8%	ICU Level of Service		A		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3505			3479	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3505			3479	
Volume (vph)	51	103	9	77	117	20	0	898	62	0	703	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	976	67	0	764	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1039	0	0	855	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2296	
v/s Ratio Prot					c0.07			c0.30			0.25	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.45			0.37	
Uniform Delay, d1		44.2			44.1			8.6			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.3			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.3			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3535			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3295			5073	
Volume (vph)	0	0	0	65	296	663	12	454	0	0	687	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	493	0	0	747	12
RTOR Reduction (vph)	0	0	0	0	0	231	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	490	0	506	0	0	757	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					32.6	32.6		58.4			58.4	
Effective Green, g (s)					32.6	32.6		59.4			59.4	
Actuated g/C Ratio					0.33	0.33		0.59			0.59	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1144	516		1957			3013	
v/s Ratio Prot					0.11						0.15	
v/s Ratio Perm						c0.31		c0.15				
v/c Ratio					0.34	0.95		0.26			0.25	
Uniform Delay, d1					25.6	32.9		9.7			9.7	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	27.4		0.3			0.2	
Delay (s)					25.6	60.3		10.1			9.9	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			48.1			10.1			9.9	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3482		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3482		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	448	54	221	499	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	487	59	240	542	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	538	0	240	542	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						38.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1945		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.28		0.48	0.20	
Uniform Delay, d1		28.4						8.1		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.4		0.3	0.0	
Delay (s)		28.7						8.4		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.4			10.2	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3442		1770	3504		1770	3423		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3442		1770	3504		1770	3423		1770	1863	1583
Volume (vph)	263	614	138	105	745	52	178	416	116	130	262	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	150	114	810	57	193	452	126	141	285	501
RTOR Reduction (vph)	0	16	0	0	4	0	0	23	0	0	0	313
Lane Group Flow (vph)	286	801	0	114	863	0	193	555	0	141	285	188
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	41.9		11.5	33.0		19.6	19.6		20.0	20.0	20.0
Effective Green, g (s)	20.4	42.9		11.5	34.0		19.6	19.6		20.0	20.0	20.0
Actuated g/C Ratio	0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1342		185	1083		315	610		322	339	288
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.11	c0.16		0.08	c0.15	
v/s Ratio Perm												0.12
v/c Ratio	0.87	0.60		0.62	0.80		0.61	0.91		0.44	0.84	0.65
Uniform Delay, d1	43.5	26.7		47.1	34.8		41.7	44.3		40.0	43.5	41.8
Progression Factor	1.00	1.00		1.34	0.63		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	21.5	2.0		4.5	4.6		2.4	14.7		1.0	16.9	5.2
Delay (s)	65.1	28.6		67.5	26.7		44.2	59.5		41.0	60.3	47.0
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		38.1			31.4			55.7			50.2	
Approach LOS		D			C			E			D	

Intersection Summary				
HCM Average Control Delay	42.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3436		1770	3484		1770	3472	
Flt Permitted	0.14	1.00			0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	259	3426			2609		1770	3484		1770	3472	
Volume (vph)	96	588	159	37	608	142	172	935	108	181	801	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	40	661	154	187	1016	117	197	871	127
RTOR Reduction (vph)	0	27	0	0	20	0	0	7	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	835	0	187	1126	0	197	989	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	35.8	35.8			35.8		15.2	46.2		15.0	46.0	
Effective Green, g (s)	35.8	35.8			35.8		15.2	47.2		15.0	47.0	
Actuated g/C Ratio	0.33	0.33			0.33		0.14	0.43		0.14	0.43	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	84	1115			849		245	1495		241	1483	
v/s Ratio Prot		0.23					0.11	c0.32		c0.11	0.28	
v/s Ratio Perm	c0.40				0.32							
v/c Ratio	1.24	0.70			0.98		0.76	0.75		0.82	0.67	
Uniform Delay, d1	37.1	32.5			36.8		45.7	26.5		46.2	25.2	
Progression Factor	1.06	1.06			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	164.6	1.6			26.6		13.2	3.6		18.9	2.4	
Delay (s)	203.8	36.1			63.4		58.8	30.0		65.1	27.6	
Level of Service	F	D			E		E	C		E	C	
Approach Delay (s)		55.1			63.4			34.1			33.8	
Approach LOS		E			E			C			C	

Intersection Summary				
HCM Average Control Delay	44.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	198	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	215	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	522	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	522	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	80	100	100	100
cM capacity (veh/h)	1598			1595			603	556	1057	346	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	218	2
Volume Left	1	133	2	1
Volume Right	0	0	215	0
cSH	1598	1595	1044	427
Volume to Capacity	0.00	0.08	0.21	0.01
Queue Length 95th (ft)	0	7	20	0
Control Delay (s)	0.4	6.6	9.4	13.5
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.4	13.5
Approach LOS			A	B

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	159	78	6	188	85	106	10	432	308	16	256	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	173	85	7	204	92	115	11	470	335	17	278	72

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	173	91	204	208	815	17	350
Volume Left (vph)	173	0	204	0	11	17	0
Volume Right (vph)	0	7	0	115	335	0	72
Hadj (s)	0.53	-0.02	0.53	-0.35	-0.21	0.53	-0.11
Departure Headway (s)	9.0	8.5	8.7	7.9	7.5	8.5	7.9
Degree Utilization, x	0.43	0.22	0.50	0.45	1.71	0.04	0.77
Capacity (veh/h)	375	407	401	445	482	410	444
Control Delay (s)	17.6	12.6	18.9	16.1	346.8	10.7	31.5
Approach Delay (s)	15.9		17.5		346.8	30.5	
Approach LOS	C		C		F	D	

Intersection Summary				
Delay	164.3			
HCM Level of Service	F			
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	402	0	0	379	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	437	0	0	412	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			437		849	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			437		849	437
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1123		331	620

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	437	412	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1123	1700
Volume to Capacity	0.26	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1769			1804		1770	1843		1770	1742	
Flt Permitted		0.79			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1421			1581		1770	1843		1770	1742	
Volume (vph)	178	194	68	36	115	20	163	604	39	19	317	144
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	211	74	39	125	22	177	657	42	21	345	157
RTOR Reduction (vph)	0	12	0	0	9	0	0	4	0	0	30	0
Lane Group Flow (vph)	0	466	0	0	177	0	177	695	0	21	472	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		413			460		222	875		29	637	
v/s Ratio Prot							c0.10	c0.38		0.01	0.27	
v/s Ratio Perm		c0.33			0.11							
v/c Ratio		1.13			0.39		0.80	0.79		0.72	0.74	
Uniform Delay, d1		19.5			15.6		23.4	12.2		26.9	15.2	
Progression Factor		1.00			1.00		0.90	1.04		0.97	1.09	
Incremental Delay, d2		84.0			0.4		14.6	6.2		53.0	6.7	
Delay (s)		103.5			16.0		35.7	18.9		79.1	23.3	
Level of Service		F			B		D	B		E	C	
Approach Delay (s)		103.5			16.0			22.3			25.5	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	41.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	202	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	220	72	5	128	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	68	310	135
Volume Left (vph)	4	57	18	5
Volume Right (vph)	64	12	72	1
Hadj (s)	-0.42	0.09	-0.09	0.04
Departure Headway (s)	4.6	5.1	4.4	4.7
Degree Utilization, x	0.11	0.10	0.37	0.17
Capacity (veh/h)	701	633	798	728
Control Delay (s)	8.2	8.7	9.9	8.7
Approach Delay (s)	8.2	8.7	9.9	8.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.3		
HCM Level of Service	A		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	119	47	25	621	383	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	51	27	675	416	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1184	454	492			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1184	454	492			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	92	97			
cM capacity (veh/h)	204	606	1071			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	180	27	675	492
Volume Left	129	27	0	0
Volume Right	51	0	0	76
cSH	251	1071	1700	1700
Volume to Capacity	0.72	0.03	0.40	0.29
Queue Length 95th (ft)	123	2	0	0
Control Delay (s)	49.0	8.4	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	49.0	0.3		0.0
Approach LOS	E			

Intersection Summary			
Average Delay		6.6	
Intersection Capacity Utilization		48.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	1.00		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3403		3539	1488		3531
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3403		3539	1488		3277
Volume (vph)	844	57	453	350	24	692
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	917	62	492	380	26	752
RTOR Reduction (vph)	5	0	0	207	0	0
Lane Group Flow (vph)	974	0	492	173	0	778
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1609		1609	676		1490
v/s Ratio Prot	c0.29		0.14			
v/s Ratio Perm				0.12		c0.24
v/c Ratio	0.61		0.31	0.26		0.52
Uniform Delay, d1	21.4		19.0	18.5		21.5
Progression Factor	0.51		0.14	1.04		1.00
Incremental Delay, d2	1.4		0.0	0.1		1.3
Delay (s)	12.2		2.7	19.3		22.8
Level of Service	B		A	B		C
Approach Delay (s)	12.2		10.0			22.8
Approach LOS	B		A			C

Intersection Summary				
HCM Average Control Delay	14.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	333	34	472	638	257	429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	37	513	693	279	466
RTOR Reduction (vph)	0	19	0	0	0	194
Lane Group Flow (vph)	362	18	513	693	279	272
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	25.7	55.4	26.2	77.3	47.6	25.7
Effective Green, g (s)	25.2	54.9	25.7	76.8	47.1	25.2
Actuated g/C Ratio	0.23	0.50	0.23	0.70	0.43	0.23
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	405	790	802	1301	798	363
v/s Ratio Prot	c0.20	0.01	c0.15	c0.37	0.15	0.17
v/s Ratio Perm						
v/c Ratio	0.89	0.02	0.64	0.53	0.35	0.75
Uniform Delay, d1	41.1	14.0	38.0	8.0	21.1	39.5
Progression Factor	0.38	0.01	0.53	0.64	1.00	1.00
Incremental Delay, d2	19.9	0.0	1.4	1.3	1.2	8.2
Delay (s)	35.7	0.1	21.6	6.3	22.4	47.7
Level of Service	D	A	C	A	C	D
Approach Delay (s)	32.4			12.8	38.2	
Approach LOS	C			B	D	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Volume (vph)	172	370	60	504	14	0	11	654	1441	252	525	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	548	15	0	12	711	1566	274	571	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	274	289	0	12	711	1566	274	619	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.4	16.4	16.4	18.6	18.6		1.1	22.9	90.1	16.7	38.5	
Effective Green, g (s)	15.9	15.9	15.9	18.6	18.6		0.6	23.4	90.1	16.2	39.0	
Actuated g/C Ratio	0.18	0.18	0.18	0.21	0.21		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	312	329	279	347	349		12	919	1583	318	790	
v/s Ratio Prot	0.11	0.22		0.16	0.17		0.01	0.20		0.15	0.34	
v/s Ratio Perm			0.03						c0.99			
v/c Ratio	0.60	1.22	0.17	0.79	0.83		1.00	0.77	0.99	0.86	0.78	
Uniform Delay, d1	34.2	37.1	31.5	33.9	34.2		44.8	30.9	0.0	35.9	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	124.1	0.1	11.0	14.6		259.8	3.9	20.2	20.0	4.9	
Delay (s)	36.2	161.2	31.6	44.9	48.8		304.6	34.8	20.2	55.8	26.9	
Level of Service	D	F	C	D	D		F	C	C	E	C	
Approach Delay (s)		112.6			46.9			26.2			35.7	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	43.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			2944	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			2944	1399				3433		1583
Volume (vph)	140	394	572	0	521	1867	0	0	0	801	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	2029	0	0	0	871	0	359
RTOR Reduction (vph)	0	218	0	0	214	0	0	0	0	0	0	238
Lane Group Flow (vph)	152	832	0	0	1138	1243	0	0	0	871	0	121
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	70.0			46.0	110.0				31.5		31.5
Effective Green, g (s)	20.0	70.0			46.0	110.0				32.0		32.0
Actuated g/C Ratio	0.18	0.64			0.42	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2052			1231	1399				999		461
v/s Ratio Prot	0.09	0.26			0.39							0.08
v/s Ratio Perm						c0.89				0.25		
v/c Ratio	0.47	0.41			0.99dr	0.89				0.87		0.26
Uniform Delay, d1	40.3	9.8			30.4	0.0				37.1		29.9
Progression Factor	1.00	1.00			0.71	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.5	0.9				8.4		0.2
Delay (s)	40.7	10.4			23.1	0.9				45.5		30.2
Level of Service	D	B			C	A				D		C
Approach Delay (s)		14.2			12.5			0.0			41.0	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1521	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1521	659			
Volume (vph)	141	1054	0	0	1838	484	550	226	983	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1146	0	0	1998	526	598	246	1068	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	71	13	0	0	0
Lane Group Flow (vph)	153	1146	0	0	1998	263	598	708	522	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	512	335			
v/s Ratio Prot	0.09	c0.32			c0.43		0.36	0.47	c0.79			
v/s Ratio Perm						0.20						
v/c Ratio	0.45	0.77			1.18	0.54	1.06	1.38	1.56			
Uniform Delay, d1	39.4	27.5			35.0	27.7	36.5	36.5	27.0			
Progression Factor	1.55	0.38			0.94	1.09	1.00	1.00	1.00			
Incremental Delay, d2	3.2	2.9			85.6	1.7	54.3	184.1	265.1			
Delay (s)	64.3	13.3			118.5	31.7	90.8	220.6	292.1			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		19.3			100.4			200.0			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM Average Control Delay	115.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1806	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1806	2628
Volume (vph)	601	765	671	259	989	223	132	16	66	278	163	1086
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	653	832	729	282	1075	242	143	17	72	302	177	1180
RTOR Reduction (vph)	0	7	140	0	0	31	0	0	63	0	0	85
Lane Group Flow (vph)	653	918	496	282	1075	211	78	82	9	0	479	1095
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	c0.19	0.28	c0.41	0.16	c0.30		0.05	0.05			0.27	c0.42
v/s Ratio Perm						0.13			0.01			
v/c Ratio	1.23	0.92	0.88	1.03	1.01	0.44	0.36	0.38	0.05		0.97	0.98
Uniform Delay, d1	46.5	37.2	26.7	46.5	38.5	31.1	43.9	44.0	42.1		39.6	30.9
Progression Factor	1.22	1.00	1.06	1.00	1.00	1.00	1.02	1.02	2.14		0.74	0.72
Incremental Delay, d2	105.0	1.8	1.6	62.1	30.7	3.0	0.7	0.8	0.1		30.5	19.2
Delay (s)	161.7	38.9	29.8	108.6	69.2	34.1	45.7	45.8	90.1		59.8	41.5
Level of Service	F	D	C	F	E	C	D	D	F		E	D
Approach Delay (s)		72.5			70.8			59.5			46.8	
Approach LOS		E			E			E			D	

Intersection Summary				
HCM Average Control Delay	64.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	939	25	0	291	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	1021	27	0	316	0
RTOR Reduction (vph)	0	0	381	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	392	51	0	7	0	1046	0	0	316	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.14	c0.03				c0.30			0.17	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.30	0.42		0.07		0.65			0.47	
Uniform Delay, d1	23.1	23.0	18.3	49.2		48.0		23.3			27.3	
Progression Factor	1.23	1.22	2.37	1.00		1.00		1.00			1.47	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		2.1			2.3	
Delay (s)	28.8	28.2	43.6	50.9		48.2		25.4			42.5	
Level of Service	C	C	D	D		D		C			D	
Approach Delay (s)		40.0			49.1			25.4			42.5	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM Average Control Delay	34.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3395		1770	3468		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3395		1770	3468		1770	1843		1770	1863	1537
Volume (vph)	169	712	184	20	583	55	514	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	774	200	22	634	60	559	455	29	63	215	170
RTOR Reduction (vph)	0	20	0	0	6	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	954	0	22	688	0	559	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		46.0	46.0		16.0	16.0	16.0
Effective Green, g (s)	10.0	30.9		2.1	23.0		45.5	45.5		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	954		34	725		732	762		249	263	217
v/s Ratio Prot	0.10	c0.28		0.01	c0.20		c0.32	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.14	1.00		0.65	0.95		0.76	0.63		0.25	0.82	0.11
Uniform Delay, d1	50.0	39.5		53.6	42.9		27.6	25.6		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.00		1.07	1.04	1.76
Incremental Delay, d2	114.5	29.1		35.3	23.0		4.7	1.7		0.5	16.7	0.2
Delay (s)	164.5	68.7		88.8	65.9		31.9	27.3		45.6	64.3	72.9
Level of Service	F	E		F	E		C	C		D	E	E
Approach Delay (s)		83.9			66.6			29.8			64.9	
Approach LOS		F			E			C			E	

Intersection Summary				
HCM Average Control Delay	60.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3414		1770	3467		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3414		1770	3467		1770	3483		1770	3483	
Volume (vph)	128	602	186	100	388	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	654	202	109	422	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	33	0	0	14	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	823	0	109	474	0	152	1179	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.3		8.4	22.3		11.9	32.3		10.0	30.4	
Effective Green, g (s)	9.4	24.8		7.4	22.8		10.9	32.8		9.0	30.9	
Actuated g/C Ratio	0.10	0.28		0.08	0.25		0.12	0.36		0.10	0.34	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	941		146	878		214	1269		177	1196	
v/s Ratio Prot	c0.08	c0.24		0.06	0.14		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.88		0.75	0.54		0.71	0.93		0.69	0.87	
Uniform Delay, d1	39.2	31.1		40.4	29.1		38.0	27.5		39.1	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	9.1		18.6	0.6		10.6	13.2		10.6	8.9	
Delay (s)	54.9	40.2		59.0	29.7		48.6	40.7		49.8	36.6	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		42.3			35.1			41.6			38.0	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	78.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3372		1770	3539	1524	1770	1685			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3372		1770	3539	1524	1770	1685			1805	
Volume (vph)	24	601	224	80	596	27	208	106	108	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	653	243	87	648	29	226	115	117	46	115	21
RTOR Reduction (vph)	0	28	0	0	0	15	0	41	0	0	5	0
Lane Group Flow (vph)	26	868	0	87	648	14	226	191	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	44.3		7.9	49.0	49.0	17.6	17.6			15.7	
Effective Green, g (s)	2.7	44.3		7.4	49.0	49.0	17.1	17.1			15.2	
Actuated g/C Ratio	0.03	0.44		0.07	0.49	0.49	0.17	0.17			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1494		131	1734	747	303	288			274	
v/s Ratio Prot	0.01	c0.26		c0.05	0.18		c0.13	0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.58		0.66	0.37	0.02	0.75	0.66			0.65	
Uniform Delay, d1	48.0	20.9		45.1	15.9	13.1	39.4	38.7			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.7		10.8	0.6	0.0	9.1	5.1			4.6	
Delay (s)	57.5	22.5		55.9	16.5	13.2	48.5	43.8			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		23.5			20.9			46.1			44.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3415		1770	3539	1496	1770	1863	1520	1770	1812	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3415		1770	3539	1496	1770	1863	1520	1770	1812	
Volume (vph)	46	544	129	141	498	182	188	279	115	207	311	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	140	153	541	198	204	303	125	225	338	55
RTOR Reduction (vph)	0	18	0	0	0	115	0	0	95	0	6	0
Lane Group Flow (vph)	50	713	0	153	541	83	204	303	30	225	387	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	36.6		12.1	42.0	42.0	12.5	24.3	24.3	12.5	24.3	
Effective Green, g (s)	6.2	36.6		11.6	42.0	42.0	12.0	23.8	23.8	12.0	23.8	
Actuated g/C Ratio	0.06	0.37		0.12	0.42	0.42	0.12	0.24	0.24	0.12	0.24	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1250		205	1486	628	212	443	362	212	431	
v/s Ratio Prot	0.03	c0.21		c0.09	0.15		0.12	0.16		c0.13	c0.21	
v/s Ratio Perm						0.06			0.02			
v/c Ratio	0.45	0.57		0.75	0.36	0.13	0.96	0.68	0.08	1.06	0.90	
Uniform Delay, d1	45.3	25.4		42.8	19.9	17.8	43.8	34.7	29.6	44.0	36.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.96	
Incremental Delay, d2	2.2	1.9		13.1	0.7	0.4	50.8	4.0	0.1	77.1	19.8	
Delay (s)	47.4	27.3		55.8	20.5	18.2	94.6	38.6	29.7	120.1	55.2	
Level of Service	D	C		E	C	B	F	D	C	F	E	
Approach Delay (s)		28.6			26.1			54.9			78.8	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM Average Control Delay	44.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	790	44	96	814	12	33	12	98	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	859	48	104	885	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	898			907			1596	2037	453	1690	2054	449
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	898			907			1596	2037	453	1690	2054	449
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			86			32	72	81	100	81	98
cM capacity (veh/h)	752			746			52	47	554	34	46	557

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	572	334	104	590	308	42	113	18
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	752	1700	1700	746	1700	1700	51	341	89
Volume to Capacity	0.03	0.34	0.20	0.14	0.35	0.18	0.82	0.33	0.21
Queue Length 95th (ft)	2	0	0	12	0	0	86	35	18
Control Delay (s)	9.9	0.0	0.0	10.6	0.0	0.0	201.1	20.7	56.0
Lane LOS	A			B			F	C	F
Approach Delay (s)	0.3			1.1			69.9		56.0
Approach LOS							F		F

Intersection Summary				
Average Delay	6.3			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3453		1770	3482			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3453		1770	3482			1808	1555		1811	
Volume (vph)	30	798	101	124	735	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	867	110	135	799	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	969	0	135	856	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	37.5		11.4	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.5		10.9	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.08	0.38		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1295		193	1400			380	327		264	
v/s Ratio Prot	0.02	c0.28		c0.08	0.25			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.75		0.70	0.61			0.86	0.22		0.71	
Uniform Delay, d1	42.9	27.1		43.0	23.7			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.19	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	4.0		3.5	0.7			17.8	0.3		7.8	
Delay (s)	43.5	31.1		54.4	15.2			55.9	33.0		48.4	
Level of Service	D	C		D	B			E	C		D	
Approach Delay (s)		31.5			20.5			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	31.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	77.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3289		1770	3373		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3289		1770	3373		3433	3529		1770	3467	
Volume (vph)	205	544	314	46	398	146	422	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	591	341	50	433	159	459	1035	16	241	1052	111
RTOR Reduction (vph)	0	81	0	0	38	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	851	0	50	554	0	459	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.3	28.6		5.6	18.9		14.0	37.5		15.3	38.8	
Effective Green, g (s)	14.3	27.6		4.6	17.9		13.0	37.5		14.3	38.8	
Actuated g/C Ratio	0.14	0.28		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	253	908		81	604		446	1323		253	1345	
v/s Ratio Prot	c0.13	c0.26		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.88	0.94		0.62	0.92		1.03	0.79		0.95	0.86	
Uniform Delay, d1	42.0	35.4		46.8	40.3		43.5	27.8		42.5	28.1	
Progression Factor	0.62	0.78		1.03	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.5	13.1		9.1	18.0		50.3	5.0		43.1	7.3	
Delay (s)	47.5	40.7		57.3	55.4		93.8	32.8		85.6	35.4	
Level of Service	D	D		E	E		F	C		F	D	
Approach Delay (s)		42.0			55.5			51.3			44.0	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	47.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3440			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3440			3156			2746	
Volume (vph)	16	664	16	9	460	89	19	212	23	75	166	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	722	17	10	500	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	23	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	736	0	10	574	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1968			549			478	
v/s Ratio Prot	c0.01	c0.21		0.01	0.17							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.36		0.48	0.29			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.25		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.6	0.2		6.1	0.4			0.6			1.9	
Delay (s)	43.0	7.3		30.6	5.9			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.1			6.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	297	75	11	86	78	46	19	83	50	65	59	232
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	323	82	12	93	85	50	21	90	54	71	64	252

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	323	93	228	165	387
Volume Left (vph)	323	0	93	21	71
Volume Right (vph)	0	12	50	54	252
Hadj (s)	0.53	-0.06	-0.02	-0.14	-0.32
Departure Headway (s)	7.3	6.7	6.7	6.8	6.0
Degree Utilization, x	0.66	0.17	0.43	0.31	0.65
Capacity (veh/h)	465	510	478	459	563
Control Delay (s)	22.0	9.9	14.7	12.8	19.5
Approach Delay (s)	19.3		14.7	12.8	19.5
Approach LOS	C		B	B	C

Intersection Summary				
Delay	17.6			
HCM Level of Service	C			
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	

Intersection Summary					
HCM Average Control Delay	11.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	46.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3510			3501	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3510			3501	
Volume (vph)	73	162	14	96	123	36	0	1125	66	0	1238	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1223	72	0	1346	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1292	0	0	1445	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2161	
v/s Ratio Prot					c0.08			0.37			c0.41	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.60			0.67	
Uniform Delay, d1		42.7			43.5			12.2			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.7	
Delay (s)		46.7			45.4			13.4			14.8	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.4			14.8	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3181			5073	
Volume (vph)	0	0	0	64	237	549	19	830	0	0	1225	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	902	0	0	1332	22
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	487	0	923	0	0	1352	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1944			3100	
v/s Ratio Prot					0.09						0.27	
v/s Ratio Perm						c0.31		c0.29				
v/c Ratio					0.31	1.03		0.47			0.44	
Uniform Delay, d1					24.3	31.5		9.6			9.3	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	47.9		0.8			0.4	
Delay (s)					24.4	79.4		10.4			9.7	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			59.9			10.4			9.7	
Approach LOS		A			E			B			A	

Intersection Summary				
HCM Average Control Delay	24.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3492		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3492		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	797	78	592	733	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	866	85	643	797	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	945	0	643	797	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	78.2	
Effective Green, g (s)		23.8						49.1		25.1	78.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1559		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.23	
v/s Ratio Perm												
v/c Ratio		0.82						0.61		0.82	0.32	
Uniform Delay, d1		41.1						23.1		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.8		6.6	0.0	
Delay (s)		48.0						24.9		46.9	6.0	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.9			24.2	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	164	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	178	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	380	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			208	201	13	380	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	83	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	459	658	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	182	12
Volume Left	0	87	0	1
Volume Right	0	1	178	3
cSH	1604	1605	1055	704
Volume to Capacity	0.00	0.05	0.17	0.02
Queue Length 95th (ft)	0	4	15	1
Control Delay (s)	0.0	6.4	9.1	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	9.1	10.2
Approach LOS			A	B

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	110	35	13	191	42	20	13	380	279	17	400	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	38	14	208	46	22	14	413	303	18	435	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	120	52	208	67	730	18	477
Volume Left (vph)	120	0	208	0	14	18	0
Volume Right (vph)	0	14	0	22	303	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.21	0.53	-0.03
Departure Headway (s)	9.1	8.4	8.7	8.0	7.1	7.8	7.3
Degree Utilization, x	0.30	0.12	0.50	0.15	1.45	0.04	0.96
Capacity (veh/h)	382	410	399	434	507	451	488
Control Delay (s)	14.7	11.4	19.0	11.2	232.5	10.0	57.9
Approach Delay (s)	13.7		17.1		232.5	56.1	
Approach LOS	B		C		F	F	

Intersection Summary			
Delay	122.4		
HCM Level of Service	F		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

Existing Plus Alt#4 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	80	0	0	99	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	108	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			87		195	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		195	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1509		794	972

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	108	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1509	1700
Volume to Capacity	0.05	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	8.5%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	148	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	161	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	236	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	-0.49	0.00	-0.14	0.04
Departure Headway (s)	4.1	4.6	4.0	4.4
Degree Utilization, x	0.02	0.08	0.26	0.08
Capacity (veh/h)	791	730	871	788
Control Delay (s)	7.2	8.0	8.5	7.7
Approach Delay (s)	7.2	8.0	8.5	7.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.2	
HCM Level of Service			A	
Intersection Capacity Utilization			30.6%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	91	33	23	625	515	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	36	25	679	560	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1342	612	665			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1342	612	665			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	39	93	97			
cM capacity (veh/h)	163	493	924			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	135	25	679	665
Volume Left	99	25	0	0
Volume Right	36	0	0	105
cSH	199	924	1700	1700
Volume to Capacity	0.68	0.03	0.40	0.39
Queue Length 95th (ft)	104	2	0	0
Control Delay (s)	54.6	9.0	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	54.6	0.3		0.0
Approach LOS	F			

Intersection Summary					
Average Delay			5.0		
Intersection Capacity Utilization			46.7%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

Existing Plus Alt#4 SAT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3393		3539	1492		3529
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3393		3539	1492		3241
Volume (vph)	918	76	451	524	26	552
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	998	83	490	570	28	600
RTOR Reduction (vph)	6	0	0	318	0	0
Lane Group Flow (vph)	1075	0	490	252	0	628
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.51		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1727		1480	624		1355
v/s Ratio Prot	c0.32		0.14			
v/s Ratio Perm				0.17		c0.19
v/c Ratio	0.62		0.33	0.40		0.46
Uniform Delay, d1	19.4		21.6	22.4		23.1
Progression Factor	0.35		0.53	4.07		1.00
Incremental Delay, d2	1.5		0.1	0.2		1.1
Delay (s)	8.2		11.4	91.3		24.2
Level of Service	A		B	F		C
Approach Delay (s)	8.2		54.4			24.2
Approach LOS	A		D			C

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	483	51	660	850	269	350
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	525	55	717	924	292	380
RTOR Reduction (vph)	0	23	0	0	0	22
Lane Group Flow (vph)	525	32	717	924	292	358
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	31.5	63.6	28.6	71.5	39.4	74.4
Effective Green, g (s)	31.0	63.1	28.1	71.0	38.9	73.9
Actuated g/C Ratio	0.28	0.57	0.26	0.65	0.35	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	499	908	877	1202	659	1063
v/s Ratio Prot	c0.30	0.02	c0.21	c0.50	0.16	0.23
v/s Ratio Perm						
v/c Ratio	1.05	0.03	0.82	0.77	0.44	0.34
Uniform Delay, d1	39.5	10.2	38.5	13.7	27.2	7.7
Progression Factor	0.50	0.02	0.43	1.39	1.00	1.00
Incremental Delay, d2	50.6	0.0	3.7	2.9	2.2	0.2
Delay (s)	70.3	0.2	20.1	22.0	29.4	7.8
Level of Service	E	A	C	C	C	A
Approach Delay (s)	63.6			21.2	17.2	
Approach LOS	E			C	B	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Volume (vph)	26	21	7	811	13	16	41	256	1057	120	404	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	882	14	17	45	278	1149	130	439	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	463	449	0	45	278	1149	130	470	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.6	26.6		3.9	17.6	71.0	7.9	21.6	
Effective Green, g (s)	2.9	2.9	2.9	26.6	26.6		3.4	18.1	71.0	7.4	22.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.37	0.37		0.05	0.25	1.00	0.10	0.31	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	65	630	630		85	902	1583	184	571	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.08		0.07	c0.26	
v/s Ratio Perm			0.00						c0.73			
v/c Ratio	0.39	0.30	0.01	0.73	0.71		0.53	0.31	0.73	0.71	0.82	
Uniform Delay, d1	33.2	33.1	32.7	19.2	18.9		33.0	21.4	0.0	30.7	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.2	3.6		2.7	0.1	2.9	9.7	9.2	
Delay (s)	34.5	33.9	32.7	23.4	22.5		35.7	21.5	2.9	40.4	31.8	
Level of Service	C	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.0			22.9			7.5			33.7	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	17.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3015	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3015	1399				3433		1583
Volume (vph)	113	273	0	0	353	1253	0	0	0	992	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1362	0	0	0	1078	0	263
RTOR Reduction (vph)	0	0	0	0	120	0	0	0	0	0	0	160
Lane Group Flow (vph)	123	297	0	0	629	997	0	0	0	1078	0	103
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	63.1			47.8	110.0				38.4		38.4
Effective Green, g (s)	11.3	63.1			47.8	110.0				38.9		38.9
Actuated g/C Ratio	0.10	0.57			0.43	1.00				0.35		0.35
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2030			1310	1399				1214		560
v/s Ratio Prot	0.07	0.08			0.21							0.06
v/s Ratio Perm						c0.71				c0.31		
v/c Ratio	0.68	0.15			0.48	0.71				0.89		0.18
Uniform Delay, d1	47.6	10.9			22.2	0.0				33.5		24.6
Progression Factor	1.00	1.00			0.94	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			0.8	2.0				8.1		0.1
Delay (s)	55.2	11.1			21.7	2.0				41.6		24.7
Level of Service	E	B			C	A				D		C
Approach Delay (s)		24.0			10.5			0.0			38.3	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1450	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1450	659			
Volume (vph)	111	1154	0	0	1234	432	372	21	1128	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1254	0	0	1341	470	404	23	1226	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	300	0	162	2	0	0	0
Lane Group Flow (vph)	121	1254	0	0	1341	170	404	474	611	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	633	389			
v/s Ratio Prot	0.07	c0.35			c0.29		0.24	0.33	c0.93			
v/s Ratio Perm						0.12						
v/c Ratio	0.74	1.05			0.80	0.32	0.55	0.75	1.57			
Uniform Delay, d1	48.6	36.5			31.5	25.4	23.0	25.9	22.5			
Progression Factor	1.21	0.58			0.86	1.26	1.00	1.00	1.00			
Incremental Delay, d2	11.7	37.3			2.9	1.1	3.0	7.9	268.5			
Delay (s)	70.3	58.6			29.8	33.1	26.0	33.8	291.0			
Level of Service	E	E			C	C	C	C	F			
Approach Delay (s)		59.7			30.7			127.3			0.0	
Approach LOS		E			C			F			A	

Intersection Summary			
HCM Average Control Delay	71.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1823	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1823	2628
Volume (vph)	691	450	1141	270	442	227	227	62	101	206	270	985
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	751	489	1240	293	480	247	247	67	110	224	293	1071
RTOR Reduction (vph)	0	209	95	0	0	102	0	0	98	0	0	78
Lane Group Flow (vph)	751	900	525	293	480	145	153	161	12	0	517	993
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		497	1266
v/s Ratio Prot	c0.22	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.28	0.38
v/s Ratio Perm						0.10			0.01			
v/c Ratio	1.27	0.94	1.01	1.07	0.45	0.32	0.84	0.86	0.07		1.04	0.78
Uniform Delay, d1	45.5	36.4	31.5	46.5	31.2	29.8	48.0	48.2	44.0		40.0	23.7
Progression Factor	1.25	1.03	1.05	1.00	1.00	1.00	1.26	1.26	2.47		0.75	1.08
Incremental Delay, d2	121.2	2.3	13.7	74.0	1.4	1.8	23.7	26.6	0.1		47.7	4.1
Delay (s)	178.0	39.7	46.8	120.5	32.6	31.6	84.3	87.3	108.7		77.9	29.9
Level of Service	F	D	D	F	C	C	F	F	F		E	C
Approach Delay (s)		83.4			57.6			91.8			45.5	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM Average Control Delay	68.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3531			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3531			1863	
Volume (vph)	105	218	1025	51	0	120	0	1285	21	0	322	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1397	23	0	350	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1419	0	0	350	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	8.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.40			0.19	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.87			0.53	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		26.5			28.5	
Progression Factor	1.19	1.19	1.56	1.00		1.00		0.68			1.01	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		5.3			2.9	
Delay (s)	29.8	29.5	40.4	50.9		48.1		23.4			31.7	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.8			48.9			23.4			31.7	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	31.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Volume (vph)	66	465	210	37	601	35	232	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	505	228	40	653	38	252	163	24	38	190	97
RTOR Reduction (vph)	0	60	0	0	5	0	0	8	0	0	0	83
Lane Group Flow (vph)	72	673	0	40	686	0	252	179	0	38	190	14
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Effective Green, g (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Actuated g/C Ratio	0.05	0.40		0.02	0.37		0.17	0.17		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	85	1337		38	1301		296	305		261	275	228
v/s Ratio Prot	c0.04	c0.20		0.02	0.20		c0.14	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.50		1.05	0.53		0.85	0.59		0.15	0.69	0.06
Uniform Delay, d1	28.5	13.7		29.5	14.8		24.4	23.2		22.4	24.4	22.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	50.4	0.3		162.1	0.4		20.3	2.9		0.3	7.3	0.1
Delay (s)	78.9	14.0		191.6	15.2		44.7	26.0		22.6	31.7	22.2
Level of Service	E	B		F	B		D	C		C	C	C
Approach Delay (s)		19.8			24.9			36.7			27.8	
Approach LOS		B			C			D			C	

Intersection Summary				
HCM Average Control Delay	25.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3463		1770	3515			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3463		1770	3515			1801	1555		1772	
Volume (vph)	18	863	96	152	957	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	938	104	165	1040	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	1036	0	165	1071	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1558		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.30		c0.09	0.30			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.66		0.84	0.55			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.6		43.6	14.6			40.0	36.2		39.7	
Progression Factor	1.06	0.43		0.82	0.65			1.00	1.00		1.00	
Incremental Delay, d2	211.3	2.0		17.0	0.7			7.7	0.2		0.4	
Delay (s)	264.0	11.2		52.7	10.2			47.7	36.3		40.0	
Level of Service	F	B		D	B			D	D		D	
Approach Delay (s)		16.0			15.9			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3070		1770	3394		3433	3501		1770	3282	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3070		1770	3394		3433	3501		1770	3282	
Volume (vph)	166	532	335	69	430	65	480	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	578	364	75	467	71	522	701	27	123	743	200
RTOR Reduction (vph)	0	97	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	845	0	75	526	0	522	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.3		5.2	24.4		16.5	35.7		10.8	30.0	
Effective Green, g (s)	12.6	32.3		4.7	24.4		16.0	36.7		10.3	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.37		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	992		83	828		549	1285		182	1017	
v/s Ratio Prot	c0.10	c0.28		0.04	0.15		c0.15	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.85		0.90	0.64		0.95	0.56		0.68	0.90	
Uniform Delay, d1	42.5	31.6		47.4	33.8		41.6	25.3		43.2	33.1	
Progression Factor	1.15	0.39		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.1	7.6		66.1	3.7		26.3	1.8		7.6	12.8	
Delay (s)	63.9	20.0		113.5	37.5		67.9	27.1		50.8	45.9	
Level of Service	E	B		F	D		E	C		D	D	
Approach Delay (s)		27.0			46.8			44.1			46.4	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #4
2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3390		1770	3518		1770	3424		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3390		1770	3518		1770	3424		1770	1863	1583
Volume (vph)	514	847	332	104	742	30	121	226	63	61	222	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	349	109	781	32	127	238	66	64	234	208
RTOR Reduction (vph)	0	34	0	0	2	0	0	24	0	0	0	175
Lane Group Flow (vph)	541	1207	0	109	811	0	127	280	0	64	234	33
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	51.9		10.7	28.0		13.2	13.2		17.2	17.2	17.2
Effective Green, g (s)	34.6	52.9		10.7	29.0		13.2	13.2		17.2	17.2	17.2
Actuated g/C Ratio	0.31	0.48		0.10	0.26		0.12	0.12		0.16	0.16	0.16
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1630		172	927		212	411		277	291	248
v/s Ratio Prot	c0.31	0.36		0.06	c0.23		0.07	c0.08		0.04	c0.13	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.74		0.63	0.87		0.60	0.68		0.23	0.80	0.13
Uniform Delay, d1	37.2	23.0		47.8	38.8		45.9	46.4		40.6	44.8	40.0
Progression Factor	1.00	1.00		0.90	1.25		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	3.1		4.7	7.4		3.8	4.2		0.4	14.8	0.2
Delay (s)	68.0	26.1		47.5	55.8		49.7	50.6		41.0	59.6	40.2
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.8			54.8			50.3			49.3	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	45.7	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3435		1770	3485		1770	3452	
Flt Permitted	0.21	1.00			0.63		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	388	3453			2170		1770	3485		1770	3452	
Volume (vph)	122	709	137	74	551	123	194	663	75	118	780	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	78	580	129	204	698	79	124	821	162
RTOR Reduction (vph)	0	16	0	0	16	0	0	7	0	0	14	0
Lane Group Flow (vph)	128	874	0	0	771	0	204	770	0	124	969	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	40.7	40.7			40.7		15.2	40.3		16.0	41.1	
Effective Green, g (s)	40.7	40.7			40.7		15.2	41.3		16.0	42.1	
Actuated g/C Ratio	0.37	0.37			0.37		0.14	0.38		0.15	0.38	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	144	1278			803		245	1308		257	1321	
v/s Ratio Prot		0.25					c0.12	0.22		0.07	c0.28	
v/s Ratio Perm	0.33				c0.36							
v/c Ratio	0.89	0.68			0.96		0.83	0.59		0.48	0.73	
Uniform Delay, d1	32.5	29.2			33.8		46.2	27.5		43.2	29.1	
Progression Factor	0.44	0.49			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	33.7	1.1			22.1		20.8	1.9		1.4	3.6	
Delay (s)	48.2	15.3			56.0		67.0	29.5		44.6	32.8	
Level of Service	D	B			E		E	C		D	C	
Approach Delay (s)		19.4			56.0			37.3			34.1	
Approach LOS		B			E			D			C	

Intersection Summary				
HCM Average Control Delay	35.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	92	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	97	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	322	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	322	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	91	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	553	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	99	1
Volume Left	0	81	2	0
Volume Right	2	1	97	0
cSH	1545	1616	1067	640
Volume to Capacity	0.00	0.05	0.09	0.00
Queue Length 95th (ft)	0	4	8	0
Control Delay (s)	0.0	4.4	8.7	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 4 AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	57	61	5	153	47	112	11	191	86	119	324	90	259	8	25	253	59	10

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	123	312	288	533	267	278	69
Delay	32.3	0.4	29.6	23.8	0.5	31.1	32.5
LOS	C	A	C	C	A	C	C

HCM Average Control Delay	**27.9**
HCM Level of Service	**C**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.89			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1858	1583	1770	1802	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1665			1796	1583	1770	1802	
Volume (vph)	57	61	5	153	47	112	11	191	86	119	324	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	64	5	161	49	118	12	201	91	125	341	95
RTOR Reduction (vph)	0	3	0	0	68	0	0	0	74	0	8	0
Lane Group Flow (vph)	60	66	0	161	99	0	0	213	17	125	428	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	8.0	8.0		27.7	27.7			14.4	14.4	9.9	28.3	
Effective Green, g (s)	8.0	8.0		27.7	27.7			14.4	14.4	9.9	28.3	
Actuated g/C Ratio	0.11	0.11		0.36	0.36			0.19	0.19	0.13	0.37	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	186	194		645	607			340	300	231	671	
v/s Ratio Prot	0.03	c0.04		c0.09	0.06					0.07	c0.24	
v/s Ratio Perm								0.12	0.01			
v/c Ratio	0.32	0.34		0.25	0.16			0.63	0.06	0.54	0.64	
Uniform Delay, d1	31.5	31.6		16.9	16.3			28.3	25.2	30.9	19.6	
Progression Factor	1.00	1.00		0.04	0.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.8		0.1	0.0			3.1	0.1	1.4	1.7	
Delay (s)	32.2	32.3		0.7	0.0			31.4	25.3	32.3	21.4	
Level of Service	C	C		A	A			C	C	C	C	
Approach Delay (s)		32.3			0.4			29.6			23.8	
Approach LOS		C			A			C			C	

Intersection Summary				
HCM Average Control Delay	20.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1856		1770	1863	1751	
Flt Permitted	1.00		0.25	1.00	0.96	
Satd. Flow (perm)	1856		463	1863	1751	
Volume (vph)	259	8	25	253	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	8	26	266	62	11
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	280	0	26	266	68	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	60.4		16.1	16.1	7.6	
Effective Green, g (s)	60.4		16.1	16.1	7.6	
Actuated g/C Ratio	0.79		0.21	0.21	0.10	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1475		98	395	175	
v/s Ratio Prot	c0.15			c0.14	c0.04	
v/s Ratio Perm			0.06			
v/c Ratio	0.19		0.27	0.67	0.39	
Uniform Delay, d1	1.9		25.0	27.5	32.0	
Progression Factor	0.25		1.00	1.00	1.00	
Incremental Delay, d2	0.0		1.1	4.1	0.5	
Delay (s)	0.5		26.1	31.6	32.5	
Level of Service	A		C	C	C	
Approach Delay (s)	0.5			31.1	32.5	
Approach LOS	A			C	C	

Intersection Summary				
HCM Average Control Delay	18.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1834		1770	1850		1770	1807	
Flt Permitted		0.89			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1551			1510		1770	1850		1770	1807	
Volume (vph)	72	92	132	37	112	4	36	293	14	23	443	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	76	97	139	39	118	4	38	308	15	24	466	115
RTOR Reduction (vph)	0	58	0	0	2	0	0	3	0	0	15	0
Lane Group Flow (vph)	0	254	0	0	159	0	38	320	0	24	566	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		310			302		85	1003		32	925	
v/s Ratio Prot							c0.02	0.17		0.01	c0.31	
v/s Ratio Perm		c0.16			0.11							
v/c Ratio		0.82			0.53		0.45	0.32		0.75	0.61	
Uniform Delay, d1		19.1			17.9		23.2	6.3		24.4	8.7	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		15.5			1.3		2.7	0.8		62.8	3.0	
Delay (s)		34.7			19.2		23.0	8.2		87.2	11.7	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		34.7			19.2			9.7			14.7	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	18.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	91	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	96	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	185	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.16	0.00
Departure Headway (s)	4.3	4.7	4.0	4.3
Degree Utilization, x	0.01	0.09	0.21	0.10
Capacity (veh/h)	770	722	867	816
Control Delay (s)	7.3	8.1	8.1	7.8
Approach Delay (s)	7.3	8.1	8.1	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
HCM Level of Service	A		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	68	22	29	238	406	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	72	23	31	251	427	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	779	468	508			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	439	481			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	96	97			
cM capacity (veh/h)	340	586	1025			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	95	31	251	508
Volume Left	72	31	0	0
Volume Right	23	0	0	81
cSH	379	1025	1700	1700
Volume to Capacity	0.25	0.03	0.15	0.30
Queue Length 95th (ft)	24	2	0	0
Control Delay (s)	17.6	8.6	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.6	0.9		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization		37.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1664		1770	3539	1583		3521	
Flt Permitted		0.97	1.00	0.95	0.96		0.50	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1664		926	3539	1583		3289	
Volume (vph)	39	28	117	438	4	29	59	383	387	17	379	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	461	4	31	62	403	407	18	399	9
RTOR Reduction (vph)	0	0	116	0	5	0	0	0	138	0	1	0
Lane Group Flow (vph)	0	70	7	257	234	0	62	403	269	0	425	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	16.0	16.0		66.6	66.6	66.6		66.6	
Effective Green, g (s)		5.9	5.9	16.0	16.0		66.1	66.1	66.1		66.1	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	269	266		612	2339	1046		2174	
v/s Ratio Prot		c0.04		c0.15	0.14			0.11				
v/s Ratio Perm			0.00				0.07		c0.17		0.13	
v/c Ratio		0.65	0.08	0.96	0.88		0.10	0.17	0.26		0.20	
Uniform Delay, d1		46.1	44.5	41.6	41.1		6.2	6.5	6.9		6.6	
Progression Factor		1.00	1.00	1.34	1.34		0.04	0.05	2.94		1.00	
Incremental Delay, d2		12.1	0.3	41.1	25.3		0.1	0.1	0.3		0.2	
Delay (s)		58.2	44.7	96.8	80.5		0.4	0.4	20.6		6.8	
Level of Service		E	D	F	F		A	A	C		A	
Approach Delay (s)		49.6			88.9			9.8			6.8	
Approach LOS		D			F			A			A	

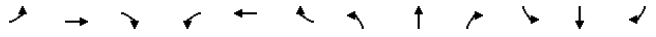
Intersection Summary				
HCM Average Control Delay	32.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	344	43	253	276	94	266
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	362	45	266	291	99	280
RTOR Reduction (vph)	0	29	0	0	0	221
Lane Group Flow (vph)	362	16	266	291	99	59
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	21.5	36.2	11.2	71.5	56.8	21.5
Effective Green, g (s)	21.0	35.7	10.7	71.0	56.3	21.0
Actuated g/C Ratio	0.21	0.36	0.11	0.71	0.56	0.21
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	565	367	1323	1049	332
v/s Ratio Prot	c0.20	0.01	c0.08	c0.16	0.05	0.04
v/s Ratio Perm						
v/c Ratio	0.97	0.03	0.72	0.22	0.09	0.18
Uniform Delay, d1	39.2	20.9	43.2	5.0	10.1	32.4
Progression Factor	1.11	3.35	0.82	0.36	1.00	1.00
Incremental Delay, d2	38.2	0.0	6.8	0.4	0.2	0.3
Delay (s)	81.8	69.9	42.5	2.2	10.3	32.7
Level of Service	F	E	D	A	B	C
Approach Delay (s)	80.5			21.4	26.8	
Approach LOS	F			C	C	

Intersection Summary				
HCM Average Control Delay	40.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	40.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

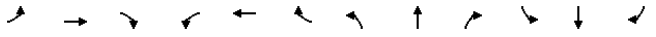
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1700		1770	3539	1583	1770	1800	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1700		1770	3539	1583	1770	1800	
Volume (vph)	5	21	16	796	79	0	88	88	932	76	248	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	838	83	0	93	93	981	80	261	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	448	473	0	93	93	981	80	325	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	27.0	27.0		6.6	19.0	69.4	4.8	17.2	
Effective Green, g (s)	2.6	2.6	2.6	27.0	27.0		6.1	19.5	69.4	4.3	17.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.09	0.28	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	70	59	654	661		156	994	1583	110	459	
v/s Ratio Prot	0.00	0.01		0.27	c0.28		0.05	0.03		0.05	0.18	
v/s Ratio Perm			0.00						c0.62			
v/c Ratio	0.08	0.31	0.01	0.69	0.72		0.60	0.09	0.62	0.73	0.71	
Uniform Delay, d1	32.2	32.5	32.2	17.7	17.9		30.5	18.4	0.0	32.0	23.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.7	3.4		4.0	0.0	1.8	18.2	4.6	
Delay (s)	32.4	33.5	32.2	20.4	21.4		34.5	18.5	1.8	50.2	28.1	
Level of Service	C	C	C	C	C		C	B	A	D	C	
Approach Delay (s)		32.9			20.9			5.8			32.3	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			0.99	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3364	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3364	1441				3433		1583
Volume (vph)	119	216	190	0	691	1100	0	0	0	917	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1158	0	0	0	965	0	136
RTOR Reduction (vph)	0	81	0	0	3	0	0	0	0	0	0	92
Lane Group Flow (vph)	125	346	0	0	763	1119	0	0	0	965	0	44
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	59.4			36.4	100.0				32.1		32.1
Effective Green, g (s)	19.0	59.4			36.4	100.0				32.6		32.6
Actuated g/C Ratio	0.19	0.59			0.36	1.00				0.33		0.33
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	1955			1224	1441				1119		516
v/s Ratio Prot	0.07	0.11			0.23					0.28		
v/s Ratio Perm						c0.78						0.03
v/c Ratio	0.37	0.18			0.62	0.78				0.86		0.09
Uniform Delay, d1	35.3	9.2			26.2	0.0				31.6		23.4
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			1.1	1.9				7.0		0.1
Delay (s)	35.6	9.4			18.6	1.9				38.6		23.4
Level of Service	D	A			B	A				D		C
Approach Delay (s)		15.3			8.7			0.0			36.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1451	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1451	1504			
Volume (vph)	74	1058	0	0	1180	353	611	2	1287	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1114	0	0	1242	372	643	2	1355	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	253	0	70	25	0	0	0
Lane Group Flow (vph)	78	1114	0	0	1242	119	605	633	667	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	551	677			
v/s Ratio Prot	0.04	c0.22			c0.27		0.36	c0.44	c0.44			
v/s Ratio Perm						0.08						
v/c Ratio	0.24	0.47			0.84	0.23	0.95	1.15	0.99			
Uniform Delay, d1	35.2	18.0			31.6	25.0	30.0	31.0	27.2			
Progression Factor	0.79	0.44			0.53	0.33	1.00	1.00	1.00			
Incremental Delay, d2	1.4	0.5			4.4	0.8	23.3	86.5	30.8			
Delay (s)	29.3	8.5			21.0	9.0	53.3	117.5	57.9			
Level of Service	C	A			C	A	D	F	E			
Approach Delay (s)		9.8			18.3			77.5			0.0	
Approach LOS		A			B			E			A	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1790	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1790	2628
Volume (vph)	669	1306	370	75	743	170	42	3	42	200	45	754
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	704	1375	389	79	782	179	44	3	44	211	47	794
RTOR Reduction (vph)	0	0	188	0	0	34	0	0	41	0	0	193
Lane Group Flow (vph)	704	1375	201	79	782	145	23	24	3	0	258	601
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		537	1317
v/s Ratio Prot	0.21	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.14	0.23
v/s Ratio Perm						0.09			0.00			
v/c Ratio	1.02	0.99	0.27	0.71	0.82	0.34	0.20	0.21	0.03		0.48	0.46
Uniform Delay, d1	39.9	29.5	13.6	45.9	34.2	29.3	43.9	44.0	43.4		28.6	16.1
Progression Factor	1.12	0.65	0.51	1.00	1.00	1.00	1.00	1.00	1.00		1.26	1.19
Incremental Delay, d2	31.5	17.2	0.1	15.2	7.7	2.1	0.6	0.6	0.1		2.6	1.0
Delay (s)	76.3	36.4	7.0	61.1	41.9	31.5	44.6	44.6	43.5		38.7	20.2
Level of Service	E	D	A	E	D	C	D	D	D		D	C
Approach Delay (s)		43.1			41.6			44.1			24.7	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3531			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3531			1863	
Volume (vph)	55	29	257	0	0	0	0	534	9	0	142	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	562	9	0	149	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	570	0	0	149	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.6					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.16			0.08	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.25			0.14	
Uniform Delay, d1	26.8	26.8	21.2					7.5			10.6	
Progression Factor	0.96	0.96	0.82					1.00			0.91	
Incremental Delay, d2	0.3	0.1	0.0					0.3			0.3	
Delay (s)	26.0	25.8	17.4					7.8			10.0	
Level of Service	C	C	B					A			A	
Approach Delay (s)		19.5			0.0			7.8			10.0	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	12.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	25.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3336		1770	3483		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3336		1770	3483		1770	1832		1770	1863	1583
Volume (vph)	393	459	284	36	510	61	297	210	26	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	483	299	38	537	64	313	221	27	29	212	108
RTOR Reduction (vph)	0	80	0	0	9	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	702	0	38	592	0	313	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	24.9	41.7		5.7	22.5		21.6	21.6		16.0	16.0	16.0
Effective Green, g (s)	24.4	42.2		5.2	23.0		21.1	21.1		15.5	15.5	15.5
Actuated g/C Ratio	0.24	0.42		0.05	0.23		0.21	0.21		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	432	1408		92	801		373	387		274	289	245
v/s Ratio Prot	c0.23	0.21		0.02	c0.17		c0.18	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.96	0.50		0.41	0.74		0.84	0.63		0.11	0.73	0.07
Uniform Delay, d1	37.3	21.2		45.9	35.7		37.8	35.9		36.3	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.98	0.98		0.81	0.85	1.27
Incremental Delay, d2	32.4	1.3		3.0	6.0		15.1	3.2		0.2	9.0	0.1
Delay (s)	69.6	22.4		48.9	41.8		52.4	38.3		29.6	43.2	45.8
Level of Service	E	C		D	D		D	D		C	D	D
Approach Delay (s)		38.8			42.2			46.2			42.9	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	41.6	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.83				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	78.2%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3378		1770	3515		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3378		1770	3515		1770	3487		1770	3497	
Volume (vph)	94	277	121	100	452	22	127	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	292	127	105	476	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	53	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	366	0	105	495	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	18.5		9.3	19.9		12.6	50.0		7.2	44.6	
Effective Green, g (s)	6.9	19.0		8.3	20.4		11.6	50.5		6.2	45.1	
Actuated g/C Ratio	0.07	0.19		0.08	0.20		0.12	0.50		0.06	0.45	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	642		147	717		205	1761		110	1577	
v/s Ratio Prot	0.06	0.11		c0.06	c0.14		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.57		0.71	0.69		0.65	0.36		0.47	0.55	
Uniform Delay, d1	45.9	36.8		44.7	36.9		42.3	14.9		45.3	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.2		15.2	2.9		7.3	0.6		3.2	1.4	
Delay (s)	78.0	38.0		59.9	39.7		49.6	15.5		48.5	21.4	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		45.7			43.2			21.4			22.9	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	31.1	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.60				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	62.0%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3416		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3416		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	276	84	43	359	177	110	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	291	88	45	378	186	116	165	32	26	53	9
RTOR Reduction (vph)	0	18	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	361	0	45	378	101	116	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		5.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1776		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	0.11		c0.03	c0.11		0.07	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.20		0.53	0.20	0.12	0.46	0.73			0.35	
Uniform Delay, d1	48.1	12.9		46.5	11.7	11.2	39.4	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.0	0.3		4.5	0.2	0.3	1.0	9.6			0.7	
Delay (s)	58.1	13.1		51.0	12.0	11.5	40.4	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		15.9			14.7			46.8			40.3	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	23.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.32				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	46.2%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3436		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3436		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	63	52	527	221	143	263	39	134	188	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	66	55	555	233	151	277	41	141	198	11
RTOR Reduction (vph)	0	17	0	0	0	120	0	0	31	0	2	0
Lane Group Flow (vph)	29	321	0	55	555	113	151	277	10	141	207	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.1		7.0	48.6	48.6	12.6	23.9	23.9	8.5	19.8	
Effective Green, g (s)	4.0	46.1		6.5	48.6	48.6	12.1	23.4	23.4	8.0	19.3	
Actuated g/C Ratio	0.04	0.46		0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1584		115	1720	769	214	436	370	142	357	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		c0.09	c0.15		c0.08	0.11	
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.15	0.71	0.64	0.03	0.99	0.58	
Uniform Delay, d1	46.8	16.0		45.1	15.7	14.2	42.2	34.5	29.5	46.0	36.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.83	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.4	9.4	2.6	0.0	71.9	1.8	
Delay (s)	49.6	16.3		47.4	16.2	14.6	51.6	37.1	29.5	119.6	32.1	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		18.9			17.8			41.1			67.4	
Approach LOS		B			B			D			E	

Intersection Summary					
HCM Average Control Delay	31.9	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	53.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	389	16	90	780	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	409	17	95	821	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	843			426			1071	1501	213	1362	1498	422
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	843			426			1071	1501	213	1362	1498	422
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			82	87	90	97	97	100
cM capacity (veh/h)	789			1129			156	107	792	80	108	581

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	273	153	95	547	296	34	85	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	789	1700	1700	1129	1700	1700	143	522	110
Volume to Capacity	0.03	0.16	0.09	0.08	0.32	0.17	0.24	0.16	0.06
Queue Length 95th (ft)	2	0	0	7	0	0	22	14	5
Control Delay (s)	9.7	0.0	0.0	8.5	0.0	0.0	37.9	13.2	39.9
Lane LOS	A			A			E	B	E
Approach Delay (s)	0.5			0.9			20.3		39.9
Approach LOS							C		E

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	39.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3473		1770	3500			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3473		1770	3500			1805	1583		1545	
Volume (vph)	3	400	57	122	661	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	421	60	128	696	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	473	0	128	748	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1702		191	2079			310	272		108	
v/s Ratio Prot	0.00	c0.14		c0.07	c0.21			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.28		0.67	0.36			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.1		42.9	10.5			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.1	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.5		54.2	7.5			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.8			14.3			46.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3360		1770	3390		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3360		1770	3390		3433	3534		1770	3508	
Volume (vph)	92	290	147	32	457	179	319	785	8	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	305	155	34	481	188	336	826	8	168	917	57
RTOR Reduction (vph)	0	71	0	0	41	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	389	0	34	628	0	336	833	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	22.4		8.7	22.6		15.0	42.6		13.3	40.9	
Effective Green, g (s)	7.5	21.4		7.7	21.6		14.0	42.6		12.3	40.9	
Actuated g/C Ratio	0.08	0.21		0.08	0.22		0.14	0.43		0.12	0.41	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	719		136	732		481	1505		218	1435	
v/s Ratio Prot	c0.05	0.12		0.02	c0.19		c0.10	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.54		0.25	0.86		0.70	0.55		0.77	0.68	
Uniform Delay, d1	45.3	34.9		43.4	37.7		41.0	21.6		42.5	24.1	
Progression Factor	1.32	1.03		1.12	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.6		0.3	9.1		3.6	1.5		14.2	2.6	
Delay (s)	74.7	36.7		48.8	49.1		44.6	23.0		56.6	26.7	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.3			49.1			29.2			31.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3502		1770	3497			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3502		1770	3497			3172			2914	
Volume (vph)	50	386	29	78	576	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	406	31	82	606	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	427	0	82	648	0	0	195	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.8	25.9		3.9	27.0			9.2			9.2	
Effective Green, g (s)	2.3	25.9		3.4	27.0			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	81	1814		120	1888			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.19							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.65	0.24		0.68	0.34			0.35			0.71	
Uniform Delay, d1	23.5	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.72	1.29		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.2	0.3		12.1	0.5			0.4			4.7	
Delay (s)	29.1	8.8		34.8	7.0			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		11.0			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	266	57	2	8	78	26	2	1	2	16	4	147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	280	60	2	8	82	27	2	1	2	17	4	155

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	280	62	118	5	176
Volume Left (vph)	280	0	8	2	17
Volume Right (vph)	0	2	27	2	155
Hadj (s)	0.53	0.01	-0.09	-0.13	-0.47
Departure Headway (s)	5.6	5.1	4.8	5.2	4.6
Degree Utilization, x	0.43	0.09	0.16	0.01	0.22
Capacity (veh/h)	622	687	711	621	724
Control Delay (s)	11.6	7.3	8.7	8.2	8.9
Approach Delay (s)	10.8		8.7	8.2	8.9
Approach LOS	B		A	A	A

Intersection Summary				
Delay	9.9			
HCM Level of Service	A			
Intersection Capacity Utilization	38.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary					
HCM Average Control Delay	14.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	56.6	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	49.5%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3504			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3504			3490	
Volume (vph)	60	193	12	111	256	20	0	1026	72	0	957	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1080	76	0	1007	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1152	0	0	1102	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.33			0.32	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.55			0.53	
Uniform Delay, d1		43.9			42.1			12.9			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.1			1.0	
Delay (s)		52.4			46.5			13.9			13.6	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.9			13.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3263			5076	
Volume (vph)	0	0	0	65	461	718	12	531	0	0	1001	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	559	0	0	1054	13
RTOR Reduction (vph)	0	0	0	0	0	183	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	573	0	572	0	0	1066	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1302	586		1795			2792	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.36		0.18				
v/c Ratio					0.42	0.98		0.32			0.38	
Uniform Delay, d1					23.5	31.1		12.3			12.8	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	31.0		0.5			0.4	
Delay (s)					23.6	62.1		12.7			13.2	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			45.8			12.7			13.2	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3490		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3490		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	525	54	434	600	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	553	57	457	632	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	602	0	457	632	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	48.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		661						1605		613	2462	
v/s Ratio Prot		c0.13						c0.17		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.38		0.75	0.26	
Uniform Delay, d1		26.3						12.3		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.7		4.3	0.0	
Delay (s)		28.4						13.0		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			13.0			15.5	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3423		1770	3503		1770	3423		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3423		1770	3503		1770	3423		1770	1863	1583
Volume (vph)	290	760	212	139	862	64	194	459	129	139	316	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	223	146	907	67	204	483	136	146	333	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	24	0	0	0	302
Lane Group Flow (vph)	305	1001	0	146	969	0	204	595	0	146	333	207
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.1		12.6	30.6		20.0	20.0		21.3	21.3	21.3
Effective Green, g (s)	21.1	40.1		12.6	31.6		20.0	20.0		21.3	21.3	21.3
Actuated g/C Ratio	0.19	0.36		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1248		203	1006		322	622		343	361	307
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.12	c0.17		0.08	c0.18	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.80		0.72	0.96		0.63	0.96		0.43	0.92	0.68
Uniform Delay, d1	43.4	31.4		47.0	38.6		41.6	44.6		39.0	43.5	41.1
Progression Factor	1.00	1.00		1.19	0.95		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.5		3.4	8.5		2.7	21.2		0.9	28.5	5.8
Delay (s)	68.2	36.9		59.1	45.2		44.5	66.5		39.8	72.0	46.9
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		44.1			47.0			61.0			54.3	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	50.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3437		1770	3488		1770	3450	
Flt Permitted	0.19	1.00			0.69		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	346	3385			2380		1770	3488		1770	3450	
Volume (vph)	198	635	260	67	665	148	270	1111	120	186	999	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	71	700	156	284	1169	126	196	1052	213
RTOR Reduction (vph)	0	41	0	0	15	0	0	8	0	0	15	0
Lane Group Flow (vph)	208	901	0	0	912	0	284	1288	0	196	1250	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	151	1477			1039		274	1110		241	1035	
v/s Ratio Prot		0.27					0.16	c0.37		0.11	c0.36	
v/s Ratio Perm	c0.60				0.38							
v/c Ratio	1.38	0.61			0.88		1.04	1.16		0.81	1.21	
Uniform Delay, d1	31.0	23.8			28.3		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	195.2	0.5			8.5		64.2	82.3		18.5	102.5	
Delay (s)	229.3	26.7			36.8		110.7	119.8		64.7	141.0	
Level of Service	F	C			D		F	F		E	F	
Approach Delay (s)		63.4			36.8			118.1			130.8	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	94.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.25			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	113.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	199	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	209	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			342	341	20	551	341	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	551	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	80	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	330	526	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	168	213	2
Volume Left	1	151	2	1
Volume Right	0	0	209	0
cSH	1599	1596	1044	406
Volume to Capacity	0.00	0.09	0.20	0.01
Queue Length 95th (ft)	0	8	19	0
Control Delay (s)	0.4	6.8	9.3	13.9
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.3	13.9
Approach LOS			A	B

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 4 PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	159	79	6	205	106	227	10	502	316	89	309	66	468	16	33	425	114	20

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	244	538	828	464	484	458	134
Delay	56.4	2.7	57.1	33.3	1.1	93.0	89.6
LOS	E	A	E	C	A	F	F

HCM Average Control Delay	**61.6**
HCM Level of Service	**E**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.90			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1672			1861	1583	1770	1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1672			1844	1583	1770	1814	
Volume (vph)	159	79	6	205	106	227	10	502	316	89	309	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	167	83	6	216	112	239	11	528	333	94	325	69
RTOR Reduction (vph)	0	2	0	0	61	0	0	0	192	0	6	0
Lane Group Flow (vph)	167	87	0	216	290	0	0	539	141	94	388	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	15.5	15.5		42.7	42.7			36.1	36.1	9.7	49.8	
Effective Green, g (s)	15.5	15.5		42.7	42.7			36.1	36.1	9.7	49.8	
Actuated g/C Ratio	0.13	0.13		0.36	0.36			0.30	0.30	0.08	0.41	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	229	238		630	595			555	476	143	753	
v/s Ratio Prot	c0.09	0.05		0.12	c0.17					c0.05	0.21	
v/s Ratio Perm								c0.29	0.09			
v/c Ratio	0.73	0.37		0.34	0.49			0.97	0.30	0.66	0.52	
Uniform Delay, d1	50.2	47.8		28.4	30.1			41.4	32.2	53.5	26.1	
Progression Factor	1.00	1.00		0.16	0.05			1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.4	0.7		0.0	0.1			30.8	0.3	8.0	0.4	
Delay (s)	60.6	48.5		4.7	1.5			72.3	32.4	61.6	26.6	
Level of Service	E	D		A	A			E	C	E	C	
Approach Delay (s)		56.4			2.7			57.1			33.3	
Approach LOS		E			A			E			C	

Intersection Summary				
HCM Average Control Delay	37.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1854		1770	1863	1751	
Flt Permitted	1.00		0.14	1.00	0.96	
Satd. Flow (perm)	1854		266	1863	1751	
Volume (vph)	468	16	33	425	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	493	17	35	447	120	21
RTOR Reduction (vph)	1	0	0	0	5	0
Lane Group Flow (vph)	509	0	35	447	136	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	101.3		28.0	28.0	10.7	
Effective Green, g (s)	101.3		28.0	28.0	10.7	
Actuated g/C Ratio	0.84		0.23	0.23	0.09	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1565		62	435	156	
v/s Ratio Prot	c0.27			c0.24	c0.08	
v/s Ratio Perm			0.13			
v/c Ratio	0.33		0.56	1.03	0.87	
Uniform Delay, d1	2.0		40.6	46.0	54.0	
Progression Factor	0.49		1.00	1.00	1.00	
Incremental Delay, d2	0.1		9.2	50.4	35.6	
Delay (s)	1.1		49.8	96.4	89.6	
Level of Service	A		D	F	F	
Approach Delay (s)	1.1			93.0	89.6	
Approach LOS	A			F	F	

Intersection Summary				
HCM Average Control Delay	51.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779			1811		1770	1842		1770	1739	
Flt Permitted		0.78			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1410			1581		1770	1842		1770	1739	
Volume (vph)	202	255	68	36	137	20	163	657	44	19	354	200
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	268	72	38	144	21	172	692	46	20	373	211
RTOR Reduction (vph)	0	10	0	0	8	0	0	4	0	0	37	0
Lane Group Flow (vph)	0	543	0	0	195	0	172	734	0	20	547	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		410			460		222	874		29	636	
v/s Ratio Prot							c0.10	c0.40		0.01	0.31	
v/s Ratio Perm		c0.39			0.12							
v/c Ratio		1.32			0.42		0.77	0.84		0.69	0.86	
Uniform Delay, d1		19.5			15.8		23.3	12.6		26.9	16.2	
Progression Factor		1.00			1.00		0.91	1.06		0.98	1.06	
Incremental Delay, d2		162.2			0.5		13.1	8.4		41.0	12.1	
Delay (s)		181.7			16.2		34.3	21.8		67.4	29.2	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		181.7			16.2			24.1			30.5	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	63.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	203	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	214	71	5	146	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	119	302	153
Volume Left (vph)	4	107	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.09	0.04
Departure Headway (s)	4.7	5.3	4.5	4.8
Degree Utilization, x	0.11	0.17	0.38	0.20
Capacity (veh/h)	674	623	762	700
Control Delay (s)	8.3	9.3	10.3	9.1
Approach Delay (s)	8.3	9.3	10.3	9.1
Approach LOS	A	A	B	A

Intersection Summary			
Delay	9.6		
HCM Level of Service	A		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	120	47	25	698	403	121
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	49	26	735	424	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	1275	488	552			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1275	488	552			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	30	91	97			
cM capacity (veh/h)	179	580	1018			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	176	26	735	552
Volume Left	126	26	0	0
Volume Right	49	0	0	127
cSH	223	1018	1700	1700
Volume to Capacity	0.79	0.03	0.43	0.32
Queue Length 95th (ft)	143	2	0	0
Control Delay (s)	63.2	8.6	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	63.2	0.3		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		7.6	
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1657		1770	3539	1452		3488	
Flt Permitted		0.97	1.00	0.95	0.96		0.23	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1657		428	3539	1452		3250	
Volume (vph)	12	5	95	771	63	53	137	459	360	22	643	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	812	66	56	144	483	379	23	677	63
RTOR Reduction (vph)	0	0	90	0	4	0	0	0	234	0	6	0
Lane Group Flow (vph)	0	18	10	480	450	0	144	483	145	0	757	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	744		164	1358	557		1247	
v/s Ratio Prot		c0.01		c0.29	0.27			0.14				
v/s Ratio Perm			0.01				c0.34		0.10		0.23	
v/c Ratio		0.17	0.10	0.64	0.60		0.88	0.36	0.26		0.61	
Uniform Delay, d1		49.3	49.1	23.4	22.9		31.5	24.2	23.2		27.2	
Progression Factor		1.00	1.00	0.32	0.31		1.25	0.83	4.18		1.00	
Incremental Delay, d2		0.6	0.4	3.3	3.0		6.4	0.1	0.1		2.2	
Delay (s)		49.8	49.4	10.9	10.0		45.9	20.1	97.1		29.4	
Level of Service		D	D	B	B		D	C	F		C	
Approach Delay (s)		49.5			10.5			52.8			29.4	
Approach LOS		D			B			D			C	

Intersection Summary					
HCM Average Control Delay	32.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	75.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	343	37	447	706	266	441
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	361	39	471	743	280	464
RTOR Reduction (vph)	0	20	0	0	0	193
Lane Group Flow (vph)	361	19	471	743	280	272
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	25.8	52.7	23.4	77.2	50.3	25.8
Effective Green, g (s)	25.3	52.2	22.9	76.7	49.8	25.3
Actuated g/C Ratio	0.23	0.47	0.21	0.70	0.45	0.23
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	407	751	715	1299	843	364
v/s Ratio Prot	c0.20	0.01	c0.14	c0.40	0.15	0.17
v/s Ratio Perm						
v/c Ratio	0.89	0.02	0.66	0.57	0.33	0.75
Uniform Delay, d1	41.0	15.4	40.0	8.4	19.4	39.4
Progression Factor	0.69	0.55	0.78	0.30	1.00	1.00
Incremental Delay, d2	18.3	0.0	1.9	1.6	1.1	8.1
Delay (s)	46.6	8.5	32.9	4.1	20.4	47.4
Level of Service	D	A	C	A	C	D
Approach Delay (s)	42.9			15.2	37.3	
Approach LOS	D			B	D	

Intersection Summary			
HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Volume (vph)	172	370	60	686	14	0	11	701	1594	269	563	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	722	15	0	12	738	1678	283	593	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	361	376	0	12	738	1678	283	640	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.2	16.2	16.2	23.0	23.0		1.2	23.9	96.5	17.9	40.6	
Effective Green, g (s)	15.7	15.7	15.7	23.0	23.0		0.7	24.4	96.5	17.4	41.1	
Actuated g/C Ratio	0.16	0.16	0.16	0.24	0.24		0.01	0.25	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	288	303	258	401	403		13	895	1583	319	778	
v/s Ratio Prot	0.10	0.21		0.21	0.22		0.01	0.21		0.16	0.35	
v/s Ratio Perm			0.03						c1.06			
v/c Ratio	0.63	1.28	0.18	0.90	0.93		0.92	0.82	1.06	0.89	0.82	
Uniform Delay, d1	37.7	40.4	34.8	35.6	36.0		47.9	34.0	48.2	38.6	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	150.5	0.1	22.6	28.4		205.3	6.1	40.4	23.7	6.9	
Delay (s)	40.8	190.9	34.9	58.3	64.4		253.1	40.1	88.7	62.3	31.3	
Level of Service	D	F	C	E	E		F	D	F	E	C	
Approach Delay (s)		132.5			61.4			74.7			40.8	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM Average Control Delay	73.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	0.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2916	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2916	1399				3433		1583
Volume (vph)	140	403	575	0	522	2065	0	0	0	1021	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	2174	0	0	0	1075	0	347
RTOR Reduction (vph)	0	235	0	0	266	0	0	0	0	0	0	177
Lane Group Flow (vph)	147	794	0	0	1170	1287	0	0	0	1075	0	170
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	66.2			42.2	110.0				35.3		35.3
Effective Green, g (s)	20.0	66.2			42.2	110.0				35.8		35.8
Actuated g/C Ratio	0.18	0.60			0.38	1.00				0.33		0.33
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1942			1119	1399				1117		515
v/s Ratio Prot	0.08	0.25			c0.40							0.11
v/s Ratio Perm						c0.92				0.31		
v/c Ratio	0.46	0.41			1.12dr	0.92				0.96		0.33
Uniform Delay, d1	40.2	11.6			33.9	0.0				36.4		28.0
Progression Factor	1.00	1.00			0.84	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			23.5	1.3				18.5		0.3
Delay (s)	40.5	12.2			51.9	1.3				54.9		28.3
Level of Service	D	B			D	A				D		C
Approach Delay (s)		15.7			28.0			0.0			48.4	
Approach LOS		B			C			A			D	

Intersection Summary				
HCM Average Control Delay	30.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	85.7%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1511	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1511	659			
Volume (vph)	142	1280	0	0	2017	434	571	226	1186	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1347	0	0	2123	457	601	238	1248	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	271	0	86	6	0	0	0
Lane Group Flow (vph)	149	1347	0	0	2123	186	601	776	618	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	508	335			
v/s Ratio Prot	0.08	c0.38			c0.46		0.36	0.51	c0.94			
v/s Ratio Perm						0.14						
v/c Ratio	0.44	0.90			1.26	0.38	1.06	1.53	1.84			
Uniform Delay, d1	39.3	29.9			35.0	25.8	36.5	36.5	27.0			
Progression Factor	1.56	0.36			0.94	1.27	1.00	1.00	1.00			
Incremental Delay, d2	2.3	5.5			117.9	0.7	55.9	247.6	391.0			
Delay (s)	63.5	16.3			150.7	33.5	92.4	284.1	418.0			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		21.0			130.0			268.9			0.0	
Approach LOS		C			F			F			A	

Intersection Summary				
HCM Average Control Delay	150.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.60			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1803	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1803	2628
Volume (vph)	667	1021	779	325	1174	300	132	16	66	322	163	1037
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	702	1075	820	342	1236	316	139	17	69	339	172	1092
RTOR Reduction (vph)	0	3	136	0	0	35	0	0	60	0	0	86
Lane Group Flow (vph)	702	1120	636	342	1236	281	76	80	9	0	511	1006
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		492	1123
v/s Ratio Prot	0.20	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.28	0.38
v/s Ratio Perm						0.18			0.01			
v/c Ratio	1.32	1.11	1.13	1.25	1.16	0.59	0.36	0.37	0.04		1.04	0.90
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	32.8	43.9	44.0	42.1		40.0	29.2
Progression Factor	1.20	1.05	1.12	1.06	1.07	1.13	1.02	1.03	2.10		0.98	0.78
Incremental Delay, d2	146.2	51.2	59.2	132.8	82.0	4.1	0.7	0.7	0.1		46.7	9.2
Delay (s)	202.0	91.5	92.2	182.2	123.1	41.1	45.6	45.8	88.7		85.9	32.0
Level of Service	F	F	F	F	F	D	D	D	F		F	C
Approach Delay (s)		121.6			120.1			58.9			49.2	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	100.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	98.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3526			1863	
Volume (vph)	121	156	824	0	0	0	0	1130	25	0	302	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1189	26	0	318	0
RTOR Reduction (vph)	0	0	192	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	197	675	0	0	0	0	1214	0	0	318	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.24					c0.34			0.17	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.40					0.59			0.52	
Uniform Delay, d1	25.4	25.4	11.6					14.3			30.0	
Progression Factor	1.26	1.24	1.81					1.00			1.22	
Incremental Delay, d2	0.6	0.3	0.1					1.2			3.1	
Delay (s)	32.6	31.7	21.2					15.6			39.6	
Level of Service	C	C	C					B			D	
Approach Delay (s)		23.9			0.0			15.6			39.6	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3357		1770	3480		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3357		1770	3480		1770	1846		1770	1863	1539
Volume (vph)	190	822	290	20	723	56	532	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	865	305	21	761	59	560	537	28	72	256	160
RTOR Reduction (vph)	0	31	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1139	0	21	814	0	560	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	943		34	728		677	707		304	320	264
v/s Ratio Prot	0.11	c0.34		0.01	c0.23		c0.32	0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.21		0.62	1.12		0.83	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.6		53.6	43.5		30.7	30.2		39.3	43.7	38.4
Progression Factor	1.24	0.91		1.00	1.00		1.01	1.01		1.24	1.19	2.48
Incremental Delay, d2	147.2	102.7		29.0	71.0		7.9	6.0		0.4	12.3	0.2
Delay (s)	209.3	138.8		82.5	114.5		38.8	36.5		49.0	64.1	95.6
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		149.1			113.7			37.7			72.2	
Approach LOS		F			F			D			E	

Intersection Summary					
HCM Average Control Delay	98.7	HCM Level of Service		F	
HCM Volume to Capacity ratio	0.94				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	92.3%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3422		1770	3481		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3422		1770	3481		1770	3491		1770	3477	
Volume (vph)	151	684	194	102	491	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	720	204	107	517	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	29	0	0	11	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	895	0	107	570	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.9		8.3	22.5		12.9	31.9		9.9	28.9	
Effective Green, g (s)	9.7	25.4		7.3	23.0		11.9	32.4		8.9	29.4	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	966		144	890		234	1257		175	1136	
v/s Ratio Prot	c0.09	c0.26		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.93		0.74	0.64		0.80	1.11		0.67	1.10	
Uniform Delay, d1	39.4	31.4		40.4	29.8		37.9	28.8		39.2	30.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	14.3		18.6	1.6		17.8	62.7		9.8	57.0	
Delay (s)	64.8	45.7		59.0	31.4		55.7	91.5		49.0	87.3	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		48.5			35.7			87.3			84.0	
Approach LOS		D			D			F			F	

Intersection Summary					
HCM Average Control Delay	70.0	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.97				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	87.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1018: 40th St & Horton St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3374		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3374		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	671	246	80	679	55	242	132	124	96	182	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	706	259	84	715	58	255	139	131	101	192	20
RTOR Reduction (vph)	0	30	0	0	0	34	0	38	0	0	2	0
Lane Group Flow (vph)	27	935	0	84	715	24	255	232	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	38.1		7.6	41.5	41.5	18.8	18.8			21.0	
Effective Green, g (s)	3.7	38.1		7.1	41.5	41.5	18.3	18.3			20.5	
Actuated g/C Ratio	0.04	0.38		0.07	0.42	0.42	0.18	0.18			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1285		126	1469	632	324	310			372	
v/s Ratio Prot	0.02	c0.28		c0.05	c0.20		c0.14	0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.73		0.67	0.49	0.04	0.79	0.75			0.83	
Uniform Delay, d1	47.1	26.5		45.3	21.4	17.4	39.0	38.7			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	3.6		11.4	1.2	0.1	11.5	9.1			14.6	
Delay (s)	50.2	30.1		56.7	22.6	17.5	50.5	47.8			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		30.7			25.6			49.1			52.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	35.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	78.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1019: 40th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3539	1495	1770	1863	1520	1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3428		1770	3539	1495	1770	1863	1520	1770	1825	
Volume (vph)	46	674	139	141	583	234	215	331	133	291	436	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	146	148	614	246	226	348	140	306	459	54
RTOR Reduction (vph)	0	17	0	0	0	151	0	0	100	0	4	0
Lane Group Flow (vph)	48	838	0	148	614	95	226	348	40	306	509	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.0		11.9	38.6	38.6	12.5	29.1	29.1	12.5	29.1	
Effective Green, g (s)	4.8	32.0		11.4	38.6	38.6	12.0	28.6	28.6	12.0	28.6	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1097		202	1366	577	212	533	435	212	522	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.13	0.19		c0.17	c0.28	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.76		0.73	0.45	0.16	1.07	0.65	0.09	1.44	0.97	
Uniform Delay, d1	46.6	30.6		42.8	22.8	20.1	44.0	31.3	26.2	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.94	
Incremental Delay, d2	6.8	5.1		12.2	1.1	0.6	80.4	2.6	0.1	220.9	29.8	
Delay (s)	53.4	35.7		55.0	23.9	20.7	124.4	33.9	26.2	263.8	63.0	
Level of Service	D	D		D	C	C	F	C	C	F	E	
Approach Delay (s)		36.6			27.7			61.0			138.0	
Approach LOS		D			C			E			F	

Intersection Summary				
HCM Average Control Delay	63.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1022	44	96	956	12	33	12	98	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1076	46	101	1006	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1019			1122			1864	2366	561	1908	2383	509
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1019			1122			1864	2366	561	1908	2383	509
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	55	78	100	69	98
cM capacity (veh/h)	677			618			29	28	471	18	27	509

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	717	405	101	671	348	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	677	1700	1700	618	1700	1700	29	246	55
Volume to Capacity	0.03	0.42	0.24	0.16	0.39	0.20	1.43	0.44	0.33
Queue Length 95th (ft)	3	0	0	15	0	0	119	53	29
Control Delay (s)	10.5	0.0	0.0	12.0	0.0	0.0	529.0	30.9	100.1
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			166.7		100.1
Approach LOS							F		F

Intersection Summary				
Average Delay	11.6			
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3432		1770	3490			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3432		1770	3490			1809	1555		1813	
Volume (vph)	30	972	159	158	874	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	1023	167	166	920	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	11	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1179	0	166	976	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1222		221	1393			385	331		265	
v/s Ratio Prot	0.02	c0.34		0.09	c0.28			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.96		0.75	0.70			0.87	0.27		0.71	
Uniform Delay, d1	42.9	31.6		42.2	25.1			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	18.6		1.3	0.3			18.9	0.3		8.2	
Delay (s)	43.5	50.2		50.8	15.7			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		50.0			20.7			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3292		1770	3374		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3292		1770	3374		3433	3531		1770	3479	
Volume (vph)	207	691	391	47	495	180	497	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	727	412	49	521	189	523	1266	16	281	1236	107
RTOR Reduction (vph)	0	78	0	0	36	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1061	0	49	674	0	523	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	935		81	641		446	1285		258	1322	
v/s Ratio Prot	c0.12	c0.32		0.03	0.20		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.13		0.60	1.05		1.17	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.85		1.02	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.5	67.8		7.8	48.3		99.2	24.4		81.9	27.5	
Delay (s)	41.1	98.4		55.4	86.3		142.7	56.2		124.6	58.5	
Level of Service	D	F		E	F		F	E		F	E	
Approach Delay (s)		89.2			84.3			81.2			70.0	
Approach LOS		F			F			F			E	

Intersection Summary				
HCM Average Control Delay	80.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	99.2%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3452			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3452			3117			2416	
Volume (vph)	22	834	17	45	580	97	19	292	107	81	229	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	878	18	47	611	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	20	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	894	0	47	693	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1906			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.49		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.7		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.25		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.0	9.6		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.4			8.3			20.5			28.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	372	89	11	86	103	46	19	83	50	65	59	330
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	392	94	12	91	108	48	20	87	53	68	62	347

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	392	105	247	160	478
Volume Left (vph)	392	0	91	20	68
Volume Right (vph)	0	12	48	53	347
Hadj (s)	0.53	-0.04	-0.01	-0.14	-0.37
Departure Headway (s)	8.0	7.4	7.6	7.8	6.6
Degree Utilization, x	0.87	0.22	0.52	0.35	0.87
Capacity (veh/h)	441	473	436	415	527
Control Delay (s)	43.5	11.2	18.8	14.9	39.1
Approach Delay (s)	36.6		18.8	14.9	39.1
Approach LOS	E		C	B	E

Intersection Summary				
Delay	31.8			
HCM Level of Service	D			
Intersection Capacity Utilization	81.2%	ICU Level of Service	D	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery Street

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.96	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.5			12.4			10.5	
Approach LOS		C			C			B			B	

Intersection Summary						
HCM Average Control Delay	17.9	HCM Level of Service		B		
HCM Volume to Capacity ratio	0.68					
Actuated Cycle Length (s)	63.3	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	82.1%	ICU Level of Service		E		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	332	32	121	216	36	0	1444	92	0	1518	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1520	97	0	1598	106
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1613	0	0	1700	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.82			0.86	
Uniform Delay, d1		43.5			42.5			18.7			19.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.9			5.3	
Delay (s)		109.8			47.1			22.6			24.8	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.6			24.8	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	36.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.76			1.00	
Satd. Flow (perm)					3514	1583		2706			5075	
Volume (vph)	0	0	0	64	385	732	49	1005	0	0	1536	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1058	0	0	1617	22
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	694	0	1110	0	0	1637	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1654			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.41				
v/c Ratio					0.45	1.46		0.67			0.53	
Uniform Delay, d1					25.5	31.5		11.5			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	218.9		2.2			0.6	
Delay (s)					25.6	250.4		13.7			10.7	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			165.0			13.7			10.7	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM Average Control Delay	59.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3500		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3500		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	972	78	749	888	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1023	82	788	935	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1100	0	788	935	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1324		889	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.83		0.89	0.39	
Uniform Delay, d1		40.4						31.0		39.2	8.0	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						6.2		10.3	0.0	
Delay (s)		60.4						37.2		49.5	8.0	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			37.2			27.0	
Approach LOS		E			A			D			C	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	105	12	1	0	3	175	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	190	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	447	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	447	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	82	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1067	404	603	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	193	12
Volume Left	0	114	0	1
Volume Right	0	1	190	3
cSH	1604	1605	1053	651
Volume to Capacity	0.00	0.07	0.18	0.02
Queue Length 95th (ft)	0	6	17	1
Control Delay (s)	0.0	6.7	9.2	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.2	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2010 Plus Alternative 4 Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	110	46	13	214	67	91	13	480	292	83	496	39	147	23	39	158	60	13

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	169	372	785	618	170	197	73
Delay	42.9	8.2	43.1	27.6	0.7	37.5	43.5
LOS	D	A	D	C	A	D	D

HCM Average Control Delay	**37.3**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.91			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1702			1860	1583	1770	1843	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1702			1828	1583	1770	1843	
Volume (vph)	110	46	13	214	67	91	13	480	292	83	496	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	50	14	233	73	99	14	522	317	90	539	42
RTOR Reduction (vph)	0	9	0	0	43	0	0	0	169	0	2	0
Lane Group Flow (vph)	120	55	0	233	129	0	0	536	148	90	579	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	11.4	11.4		31.1	31.1			31.0	31.0	8.5	43.5	
Effective Green, g (s)	11.4	11.4		31.1	31.1			31.0	31.0	8.5	43.5	
Actuated g/C Ratio	0.12	0.12		0.32	0.32			0.32	0.32	0.09	0.44	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	206	210		562	540			578	501	154	818	
v/s Ratio Prot	c0.07	0.03		c0.13	0.08					0.05	c0.31	
v/s Ratio Perm								c0.29	0.09			
v/c Ratio	0.58	0.26		0.41	0.24			0.93	0.30	0.58	0.71	
Uniform Delay, d1	41.0	39.5		26.3	24.7			32.4	25.3	43.1	22.1	
Progression Factor	1.00	1.00		0.42	0.17			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	0.5		0.2	0.1			21.1	0.2	3.6	2.6	
Delay (s)	44.5	40.0		11.2	4.3			53.5	25.5	46.7	24.7	
Level of Service	D	D		B	A			D	C	D	C	
Approach Delay (s)		42.9			8.2			43.1			27.6	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	31.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Alt#4 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1829		1770	1863	1746	
Flt Permitted	1.00		0.22	1.00	0.96	
Satd. Flow (perm)	1829		401	1863	1746	
Volume (vph)	147	23	39	158	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	25	42	172	65	14
RTOR Reduction (vph)	4	0	0	0	6	0
Lane Group Flow (vph)	181	0	42	172	73	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	81.5		18.6	18.6	8.5	
Effective Green, g (s)	81.5		18.6	18.6	8.5	
Actuated g/C Ratio	0.83		0.19	0.19	0.09	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1521		76	354	151	
v/s Ratio Prot	c0.10			0.09	c0.04	
v/s Ratio Perm			c0.10			
v/c Ratio	0.12		0.55	0.49	0.48	
Uniform Delay, d1	1.5		35.9	35.4	42.6	
Progression Factor	0.41		1.00	1.00	1.00	
Incremental Delay, d2	0.0		6.8	0.8	0.9	
Delay (s)	0.7		42.7	36.2	43.5	
Level of Service	A		D	D	D	
Approach Delay (s)	0.7			37.5	43.5	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	26.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	159	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	173	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	271	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.10	-0.17	0.04
Departure Headway (s)	4.4	4.8	4.2	4.5
Degree Utilization, x	0.02	0.15	0.31	0.12
Capacity (veh/h)	739	690	836	750
Control Delay (s)	7.5	8.7	9.0	8.2
Approach Delay (s)	7.5	8.7	9.0	8.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.7	
HCM Level of Service			A	
Intersection Capacity Utilization			35.2%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	112	33	23	715	590	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	122	36	25	777	641	153
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	1545	718	795			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1660	659	751			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	91	96			
cM capacity (veh/h)	85	383	709			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	25	777	795
Volume Left	122	25	0	0
Volume Right	36	0	0	153
cSH	104	709	1700	1700
Volume to Capacity	1.52	0.04	0.46	0.47
Queue Length 95th (ft)	294	3	0	0
Control Delay (s)	349.1	10.3	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	349.1	0.3		0.0
Approach LOS	F			

Intersection Summary					
Average Delay			31.5		
Intersection Capacity Utilization			54.5%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1646		1770	3539	1488		3485	
Flt Permitted		0.97	1.00	0.95	0.97		0.21	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1646		400	3539	1488		3212	
Volume (vph)	31	22	136	893	78	72	151	456	530	25	561	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	971	85	78	164	496	576	27	610	60
RTOR Reduction (vph)	0	0	41	0	5	0	0	0	318	0	6	0
Lane Group Flow (vph)	0	58	107	587	542	0	164	496	258	0	691	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	39.0	39.0		35.0	35.0	35.0		35.0	
Effective Green, g (s)		24.5	24.5	39.0	39.0		34.5	34.5	34.5		34.5	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.31	0.31	0.31		0.31	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	596	584		125	1110	467		1007	
v/s Ratio Prot		0.03		c0.35	0.33			0.14				
v/s Ratio Perm			c0.07				c0.41		0.17		0.22	
v/c Ratio		0.14	0.30	0.98	0.93		1.31	0.45	0.55		0.69	
Uniform Delay, d1		34.3	35.6	35.2	34.1		37.7	30.1	31.3		33.0	
Progression Factor		1.00	1.00	0.58	0.57		0.44	0.42	1.30		1.00	
Incremental Delay, d2		0.7	2.2	30.2	18.9		145.7	0.1	0.4		3.8	
Delay (s)		35.1	37.8	50.5	38.2		162.3	12.7	41.1		36.8	
Level of Service		D	D	D	D		F	B	D		D	
Approach Delay (s)		37.1			44.6			45.8			36.8	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	42.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	489	72	655	933	290	404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	532	78	712	1014	315	439
RTOR Reduction (vph)	0	34	0	0	0	22
Lane Group Flow (vph)	532	44	712	1014	315	417
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	31.5	62.2	27.2	71.5	40.8	75.8
Effective Green, g (s)	31.0	61.7	26.7	71.0	40.3	75.3
Actuated g/C Ratio	0.28	0.56	0.24	0.65	0.37	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	499	888	833	1202	683	1084
v/s Ratio Prot	c0.30	0.03	0.21	c0.54	0.17	0.26
v/s Ratio Perm						
v/c Ratio	1.07	0.05	0.85	0.84	0.46	0.38
Uniform Delay, d1	39.5	10.9	39.8	15.2	26.6	7.4
Progression Factor	0.59	0.44	0.59	1.86	1.00	1.00
Incremental Delay, d2	52.5	0.0	4.5	3.8	2.2	0.2
Delay (s)	75.7	4.9	27.9	32.0	28.8	7.7
Level of Service	E	A	C	C	C	A
Approach Delay (s)	66.6			30.3	16.5	
Approach LOS	E			C	B	

Intersection Summary				
HCM Average Control Delay	34.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	82.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Volume (vph)	26	21	7	1003	13	16	41	303	1302	135	442	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	1090	14	17	45	329	1415	147	480	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	569	551	0	45	329	1415	147	511	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.5	3.5	3.5	26.0	26.0		4.0	19.6	73.3	8.7	24.3	
Effective Green, g (s)	3.0	3.0	3.0	26.0	26.0		3.5	20.1	73.3	8.2	24.8	
Actuated g/C Ratio	0.04	0.04	0.04	0.35	0.35		0.05	0.27	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	65	596	597		85	970	1583	198	621	
v/s Ratio Prot	0.02	0.01		0.34	0.33		0.03	0.09		0.08	0.28	
v/s Ratio Perm			0.00						c0.89			
v/c Ratio	0.39	0.30	0.01	0.95	0.92		0.53	0.34	0.89	0.74	0.82	
Uniform Delay, d1	34.3	34.1	33.7	23.1	22.7		34.1	21.3	0.0	31.5	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	25.8	19.9		2.7	0.2	8.2	12.3	8.5	
Delay (s)	35.5	35.0	33.7	48.9	42.6		36.8	21.4	8.2	43.8	30.7	
Level of Service	D	C	C	D	D		D	C	A	D	C	
Approach Delay (s)		35.1			45.8			11.3			33.7	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	26.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			2948	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			2948	1399				3433		1583
Volume (vph)	113	281	1	0	359	1543	0	0	0	1223	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1677	0	0	0	1329	0	263
RTOR Reduction (vph)	0	0	0	0	190	0	0	0	0	0	0	116
Lane Group Flow (vph)	123	306	0	0	727	1150	0	0	0	1329	0	147
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	55.6			40.3	110.0				45.9		45.9
Effective Green, g (s)	11.3	55.6			40.3	110.0				46.4		46.4
Actuated g/C Ratio	0.10	0.51			0.37	1.00				0.42		0.42
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1788			1080	1399				1448		668
v/s Ratio Prot	0.07	0.09			0.25							0.09
v/s Ratio Perm						c0.82				c0.39		
v/c Ratio	0.68	0.17			0.67	0.82				0.92		0.22
Uniform Delay, d1	47.6	14.7			29.3	0.0				30.0		20.3
Progression Factor	1.00	1.00			1.10	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.4	2.4				9.5		0.1
Delay (s)	55.2	14.9			33.8	2.4				39.5		20.4
Level of Service	E	B			C	A				D		C
Approach Delay (s)		26.5			16.3			0.0			36.3	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	25.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	111	1392	0	0	1516	419	386	21	1372	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1513	0	0	1648	455	420	23	1491	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	291	0	161	1	0	0	0
Lane Group Flow (vph)	121	1513	0	0	1648	164	420	607	745	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.8	37.0			39.7	39.7	48.0	48.0	65.0			
Effective Green, g (s)	10.3	37.0			39.7	39.7	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	166	1197			1674	526	734	632	389			
v/s Ratio Prot	0.07	c0.43			c0.36		0.25	0.42	c1.13			
v/s Ratio Perm						0.11						
v/c Ratio	0.73	1.26			0.98	0.31	0.57	0.96	1.92			
Uniform Delay, d1	48.5	36.5			34.8	25.3	23.3	30.1	22.5			
Progression Factor	1.24	0.59			0.96	1.20	1.00	1.00	1.00			
Incremental Delay, d2	9.0	123.6			13.4	0.9	3.2	27.4	421.5			
Delay (s)	69.2	145.0			46.8	31.2	26.5	57.5	444.0			
Level of Service	E	F			D	C	C	E	F			
Approach Delay (s)		139.4			43.4			199.9			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	124.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1815	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1815	2628
Volume (vph)	754	759	1251	350	668	305	227	62	101	299	270	1034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	820	825	1360	380	726	332	247	67	110	325	293	1124
RTOR Reduction (vph)	0	120	85	0	0	91	0	0	98	0	0	34
Lane Group Flow (vph)	820	1331	649	380	726	241	153	161	12	0	618	1090
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.24	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.34	0.41
v/s Ratio Perm						0.16			0.01			
v/c Ratio	1.38	1.35	1.25	1.39	0.68	0.53	0.84	0.86	0.07		1.25	0.86
Uniform Delay, d1	45.5	37.5	31.5	46.5	33.9	32.0	48.0	48.2	44.0		40.0	25.2
Progression Factor	1.23	1.03	1.08	1.00	1.00	1.00	1.26	1.26	2.47		0.90	0.67
Incremental Delay, d2	173.2	157.5	111.8	195.1	3.6	4.3	23.7	26.6	0.1		121.2	4.6
Delay (s)	229.4	196.3	145.7	241.6	37.5	36.3	84.3	87.3	108.7		157.4	21.6
Level of Service	F	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		193.0			91.2			91.8			69.8	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	131.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1555	21	0	364	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1690	23	0	396	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1712	0	0	396	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.48			0.21	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.92			0.46	
Uniform Delay, d1	21.7	21.7	26.3					23.9			20.4	
Progression Factor	1.03	1.04	1.10					0.56			0.52	
Incremental Delay, d2	0.7	0.3	5.7					6.4			1.7	
Delay (s)	23.0	22.8	34.5					19.8			12.4	
Level of Service	C	C	C					B			B	
Approach Delay (s)		31.5			0.0			19.8			12.4	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Volume (vph)	86	622	344	38	751	36	284	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	676	374	41	816	39	309	238	24	39	250	103
RTOR Reduction (vph)	0	101	0	0	5	0	0	5	0	0	0	83
Lane Group Flow (vph)	93	949	0	41	850	0	309	257	0	39	250	20
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.7		2.3	18.0		14.2	14.2		12.8	12.8	12.8
Effective Green, g (s)	4.0	19.7		2.3	18.0		14.2	14.2		12.8	12.8	12.8
Actuated g/C Ratio	0.06	0.30		0.04	0.28		0.22	0.22		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	109	1010		63	972		387	400		349	367	305
v/s Ratio Prot	c0.05	c0.28		0.02	0.24		c0.17	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.94		0.65	0.87		0.80	0.64		0.11	0.68	0.07
Uniform Delay, d1	30.2	22.1		31.0	22.4		24.0	23.1		21.4	24.2	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.8	15.6		21.5	8.8		10.9	3.5		0.1	5.1	0.1
Delay (s)	74.1	37.7		52.5	31.3		35.0	26.6		21.6	29.3	21.3
Level of Service	E	D		D	C		C	C		C	C	C
Approach Delay (s)		40.7			32.2			31.1			26.5	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	34.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3436		1770	3519			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3436		1770	3519			1802	1555		1774	
Volume (vph)	18	1039	164	175	1117	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1129	178	190	1214	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1298	0	190	1245	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1519		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.38		c0.11	0.35			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.85		0.97	0.65			0.76	0.15		0.22	
Uniform Delay, d1	49.4	25.0		44.3	16.2			39.8	35.7		39.7	
Progression Factor	1.05	0.54		0.81	0.67			1.00	1.00		1.00	
Incremental Delay, d2	217.1	6.0		23.6	0.4			9.9	0.2		0.4	
Delay (s)	269.1	19.4		59.2	11.4			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		23.1			17.7			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3065		1770	3364		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3065		1770	3364		3433	3511		1770	3339	
Volume (vph)	167	658	422	72	540	102	572	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	715	459	78	587	111	622	988	27	160	1017	200
RTOR Reduction (vph)	0	102	0	0	15	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1072	0	78	683	0	622	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	990		83	817		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.35		0.04	0.20		c0.18	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.08		0.94	0.84		1.13	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.8		47.5	36.0		42.0	29.4		42.9	34.5	
Progression Factor	1.18	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.5	49.1		77.0	9.9		80.6	6.1		15.0	82.9	
Delay (s)	62.4	63.4		124.5	45.8		122.6	35.5		57.8	117.4	
Level of Service	E	E		F	D		F	D		E	F	
Approach Delay (s)		63.3			53.8			68.6			110.5	
Approach LOS		E			D			E			F	

Intersection Summary				
HCM Average Control Delay	76.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	100.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #4
2030

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3379		1770	3502		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3379		1770	3502		1770	3436		1770	1863	1583
Volume (vph)	577	881	380	118	778	59	124	271	66	68	283	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	400	124	819	62	131	285	69	72	298	214
RTOR Reduction (vph)	0	42	0	0	5	0	0	20	0	0	0	177
Lane Group Flow (vph)	607	1285	0	124	876	0	131	334	0	72	298	37
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	48.7		11.1	24.8		14.3	14.3		18.9	18.9	18.9
Effective Green, g (s)	35.0	49.7		11.1	25.8		14.3	14.3		18.9	18.9	18.9
Actuated g/C Ratio	0.32	0.45		0.10	0.23		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1527		179	821		230	447		304	320	272
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.16	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.84		0.69	1.07		0.57	0.75		0.24	0.93	0.14
Uniform Delay, d1	37.5	26.7		47.8	42.1		45.0	46.1		39.3	44.9	38.6
Progression Factor	1.00	1.00		0.87	1.14		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.8		3.0	37.7		2.6	6.4		0.4	32.8	0.2
Delay (s)	98.2	32.4		44.8	85.7		47.6	52.5		39.7	77.7	38.8
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		53.1			80.7			51.1			58.8	
Approach LOS		D			F			D			E	

Intersection Summary					
HCM Average Control Delay	60.6	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.00				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	90.4%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3420		1770	3483		1770	3462	
Flt Permitted	0.19	1.00			0.60		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	356	3451			2053		1770	3483		1770	3462	
Volume (vph)	123	746	148	104	602	162	218	801	95	119	918	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	109	634	171	229	843	100	125	966	164
RTOR Reduction (vph)	0	15	0	0	18	0	0	8	0	0	12	0
Lane Group Flow (vph)	129	926	0	0	896	0	229	935	0	125	1118	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		15.7	33.0		16.0	33.3	
Effective Green, g (s)	48.0	48.0			48.0		15.7	34.0		16.0	34.3	
Actuated g/C Ratio	0.44	0.44			0.44		0.14	0.31		0.15	0.31	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	155	1506			896		253	1077		257	1080	
v/s Ratio Prot		0.27					0.13	c0.27		0.07	c0.32	
v/s Ratio Perm	0.36				c0.44							
v/c Ratio	0.83	0.61			1.00		0.91	0.87		0.49	1.03	
Uniform Delay, d1	27.4	23.9			31.0		46.4	35.9		43.2	37.8	
Progression Factor	0.39	0.39			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.5	0.4			29.8		32.4	9.5		1.5	36.8	
Delay (s)	30.1	9.7			60.8		78.8	45.3		44.7	74.6	
Level of Service	C	A			E		E	D		D	E	
Approach Delay (s)		12.1			60.8			51.9			71.6	
Approach LOS		B			E			D			E	

Intersection Summary				
HCM Average Control Delay	49.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	105.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	102	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	107	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	461	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	461	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	90	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	429	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	109	1
Volume Left	0	145	2	0
Volume Right	2	1	107	0
cSH	1545	1616	1060	520
Volume to Capacity	0.00	0.09	0.10	0.00
Queue Length 95th (ft)	0	7	9	0
Control Delay (s)	0.0	5.5	8.8	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.8	11.9
Approach LOS			A	B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 4 AM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	66	61	5	153	47	222	11	144	86	120	496	152	259	9	50	253	169	14

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	132	422	241	768	268	303	183
Delay	44.8	1.2	29.4	40.4	0.8	50.8	52.2
LOS	D	A	C	D	A	D	D

HCM Average Control Delay	**42.4**
HCM Level of Service	**D**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1632			1856	1583	1770	1797	
Flt Permitted	0.95	1.00		0.95	1.00			0.86	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1842		1770	1632			1601	1583	1770	1797	
Volume (vph)	66	61	5	153	47	222	11	144	86	120	496	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	64	5	161	49	234	12	152	91	126	522	160
RTOR Reduction (vph)	0	3	0	0	133	0	0	0	67	0	9	0
Lane Group Flow (vph)	69	66	0	161	150	0	0	164	24	126	673	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	9.0	9.0		37.4	37.4			27.1	27.1	11.5	42.6	
Effective Green, g (s)	9.0	9.0		37.4	37.4			27.1	27.1	11.5	42.6	
Actuated g/C Ratio	0.09	0.09		0.37	0.37			0.27	0.27	0.11	0.42	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	158	164		655	604			430	425	202	758	
v/s Ratio Prot	c0.04	0.04		0.09	c0.09					0.07	c0.37	
v/s Ratio Perm								0.10	0.02			
v/c Ratio	0.44	0.40		0.25	0.25			0.38	0.06	0.62	0.89	
Uniform Delay, d1	43.6	43.5		22.0	22.0			30.1	27.5	42.7	27.0	
Progression Factor	1.00	1.00		0.11	0.02			1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	1.2		0.1	0.1			0.4	0.0	4.3	12.2	
Delay (s)	45.0	44.7		2.5	0.5			30.5	27.5	47.0	39.2	
Level of Service	D	D		A	A			C	C	D	D	
Approach Delay (s)		44.8			1.2			29.4			40.4	
Approach LOS		D			A			C			D	

Intersection Summary				
HCM Average Control Delay	28.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1762	
Flt Permitted	1.00		0.21	1.00	0.96	
Satd. Flow (perm)	1855		394	1863	1762	
Volume (vph)	259	9	50	253	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	9	53	266	178	15
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	281	0	53	266	190	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	78.5		18.9	18.9	14.5	
Effective Green, g (s)	78.5		18.9	18.9	14.5	
Actuated g/C Ratio	0.78		0.19	0.19	0.14	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1442		74	349	253	
v/s Ratio Prot	c0.15			c0.14	c0.11	
v/s Ratio Perm			0.13			
v/c Ratio	0.19		0.72	0.76	0.75	
Uniform Delay, d1	3.0		38.5	38.9	41.5	
Progression Factor	0.25		1.00	1.00	1.00	
Incremental Delay, d2	0.0		26.3	9.1	10.7	
Delay (s)	0.8		64.8	48.0	52.2	
Level of Service	A		E	D	D	
Approach Delay (s)	0.8			50.8	52.2	
Approach LOS	A			D	D	

Intersection Summary				
HCM Average Control Delay	33.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1834		1770	1851		1770	1806	
Flt Permitted		0.88			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1535			1507		1770	1851		1770	1806	
Volume (vph)	77	92	132	37	112	4	36	338	14	23	524	135
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	97	139	39	118	4	38	356	15	24	552	142
RTOR Reduction (vph)	0	56	0	0	2	0	0	2	0	0	15	0
Lane Group Flow (vph)	0	261	0	0	159	0	38	369	0	24	679	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		307			301		85	1003		32	925	
v/s Ratio Prot							c0.02	0.20		0.01	c0.38	
v/s Ratio Perm		c0.17			0.11							
v/c Ratio		0.85			0.53		0.45	0.37		0.75	0.73	
Uniform Delay, d1		19.3			17.9		23.2	6.5		24.4	9.5	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		19.4			1.3		2.7	1.0		62.8	5.1	
Delay (s)		38.7			19.2		23.4	8.5		87.2	14.7	
Level of Service		D			B		C	A		F	B	
Approach Delay (s)		38.7			19.2			9.9			17.1	
Approach LOS		D			B			A			B	

Intersection Summary				
HCM Average Control Delay	19.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	101	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	106	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	196	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.15	0.01
Departure Headway (s)	4.5	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.22	0.18
Capacity (veh/h)	730	689	846	801
Control Delay (s)	7.5	8.3	8.3	8.3
Approach Delay (s)	7.5	8.3	8.3	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.3			
HCM Level of Service	A			
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	68	22	29	190	576	79
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	72	23	31	200	606	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	909	648	689			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	531	586			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	94	96			
cM capacity (veh/h)	229	412	742			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	95	31	200	689
Volume Left	72	31	0	0
Volume Right	23	0	0	83
cSH	257	742	1700	1700
Volume to Capacity	0.37	0.04	0.12	0.41
Queue Length 95th (ft)	41	3	0	0
Control Delay (s)	27.0	10.1	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	27.0	1.3		0.0
Approach LOS	D			

Intersection Summary				
Average Delay			2.8	
Intersection Capacity Utilization			46.9%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1667		1770	3539	1583		3521	
Flt Permitted		0.97	1.00	0.95	0.96		0.50	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1667		935	3539	1583		3308	
Volume (vph)	39	28	117	497	4	29	60	262	332	17	372	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	523	4	31	63	276	349	18	392	8
RTOR Reduction (vph)	0	0	116	0	5	0	0	0	118	0	1	0
Lane Group Flow (vph)	0	70	7	289	264	0	63	276	231	0	417	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	16.0	16.0		66.6	66.6	66.6		66.6	
Effective Green, g (s)		5.9	5.9	16.0	16.0		66.1	66.1	66.1		66.1	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	269	267		618	2339	1046		2187	
v/s Ratio Prot		c0.04		c0.17	0.16			0.08				
v/s Ratio Perm			0.00				0.07		c0.15		0.13	
v/c Ratio		0.65	0.08	1.07	0.99		0.10	0.12	0.22		0.19	
Uniform Delay, d1		46.1	44.5	42.0	41.9		6.2	6.2	6.7		6.6	
Progression Factor		1.00	1.00	1.35	1.35		0.08	0.09	1.52		1.00	
Incremental Delay, d2		12.1	0.3	74.3	49.7		0.3	0.1	0.4		0.2	
Delay (s)		58.2	44.7	130.8	106.4		0.7	0.6	10.6		6.8	
Level of Service		E	D	F	F		A	A	B		A	
Approach Delay (s)		49.6			119.1			5.7			6.8	
Approach LOS		D			F			A			A	

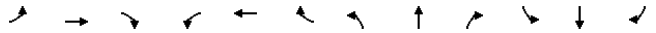
Intersection Summary				
HCM Average Control Delay		44.6	HCM Level of Service	D
HCM Volume to Capacity ratio		0.40		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		49.7%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	294	38	285	247	147	294
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	309	40	300	260	155	309
RTOR Reduction (vph)	0	26	0	0	0	248
Lane Group Flow (vph)	309	14	300	260	155	61
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	20.4	36.0	12.1	72.6	57.0	20.4
Effective Green, g (s)	19.9	35.5	11.6	72.1	56.5	19.9
Actuated g/C Ratio	0.20	0.36	0.12	0.72	0.56	0.20
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	352	562	398	1343	1053	315
v/s Ratio Prot	c0.17	0.01	c0.09	c0.14	0.08	0.04
v/s Ratio Perm						
v/c Ratio	0.88	0.03	0.75	0.19	0.15	0.20
Uniform Delay, d1	38.9	21.0	42.8	4.5	10.3	33.4
Progression Factor	1.10	3.31	0.83	0.31	1.00	1.00
Incremental Delay, d2	20.4	0.0	7.8	0.3	0.3	0.3
Delay (s)	63.2	69.6	43.1	1.7	10.6	33.7
Level of Service	E	E	D	A	B	C
Approach Delay (s)	64.0			23.9	26.0	
Approach LOS	E			C	C	

Intersection Summary				
HCM Average Control Delay	34.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	42.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1700		1770	3539	1583	1770	1805	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1700		1770	3539	1583	1770	1805	
Volume (vph)	5	21	16	758	79	0	88	107	992	76	272	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	798	83	0	93	113	1044	80	286	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	429	452	0	93	113	1044	80	351	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	26.9	26.9		6.6	19.6	70.0	4.9	17.9	
Effective Green, g (s)	2.6	2.6	2.6	26.9	26.9		6.1	20.1	70.0	4.4	18.4	
Actuated g/C Ratio	0.04	0.04	0.04	0.38	0.38		0.09	0.29	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	646	653		154	1016	1583	111	474	
v/s Ratio Prot	0.00	0.01		0.26	0.27		0.05	0.03		0.05	0.19	
v/s Ratio Perm			0.00						c0.66			
v/c Ratio	0.08	0.32	0.01	0.66	0.69		0.60	0.11	0.66	0.72	0.74	
Uniform Delay, d1	32.5	32.8	32.5	17.8	18.1		30.8	18.4	0.0	32.2	23.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	2.3	2.9		4.5	0.0	2.2	17.6	5.8	
Delay (s)	32.7	33.8	32.5	20.1	21.0		35.3	18.4	2.2	49.8	29.5	
Level of Service	C	C	C	C	C		D	B	A	D	C	
Approach Delay (s)		33.2			20.6			6.1			33.2	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			0.99	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3288			3365	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3288			3365	1441				3433		1583
Volume (vph)	120	236	211	0	741	1178	0	0	0	889	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1240	0	0	0	936	0	151
RTOR Reduction (vph)	0	88	0	0	3	0	0	0	0	0	0	103
Lane Group Flow (vph)	126	382	0	0	818	1199	0	0	0	936	0	48
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	60.2			37.2	100.0				31.3		31.3
Effective Green, g (s)	19.0	60.2			37.2	100.0				31.8		31.8
Actuated g/C Ratio	0.19	0.60			0.37	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	1979			1252	1441				1092		503
v/s Ratio Prot	0.07	0.12			0.24					0.27		
v/s Ratio Perm						c0.83						0.03
v/c Ratio	0.38	0.19			0.65	0.83				0.86		0.10
Uniform Delay, d1	35.3	9.0			26.0	0.0				32.0		24.0
Progression Factor	1.00	1.00			0.65	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	2.0				6.7		0.1
Delay (s)	35.6	9.2			17.8	2.0				38.7		24.0
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.8			8.4			0.0			36.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1449	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1449	1504			
Volume (vph)	82	1042	0	0	1274	409	645	2	1387	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1097	0	0	1341	431	679	2	1460	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	293	0	71	26	0	0	0
Lane Group Flow (vph)	86	1097	0	0	1341	138	647	682	715	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	551	677			
v/s Ratio Prot	0.05	c0.22			c0.29		0.38	c0.47	c0.48			
v/s Ratio Perm						0.09						
v/c Ratio	0.27	0.46			0.90	0.27	1.01	1.24	1.06			
Uniform Delay, d1	35.3	17.9			32.5	25.3	31.0	31.0	27.5			
Progression Factor	0.76	0.46			0.53	0.32	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.5			7.2	1.0	38.8	121.7	50.2			
Delay (s)	28.5	8.8			24.4	9.1	69.8	152.7	77.7			
Level of Service	C	A			C	A	E	F	E			
Approach Delay (s)		10.2			20.7			101.7			0.0	
Approach LOS		B			C			F			A	

Intersection Summary			
HCM Average Control Delay	52.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1790	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1790	2628
Volume (vph)	494	1601	334	75	843	171	42	3	42	202	45	804
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	494	1601	334	75	843	171	42	3	42	202	45	804
RTOR Reduction (vph)	0	0	145	0	0	31	0	0	39	0	0	194
Lane Group Flow (vph)	494	1601	189	75	843	140	22	23	3	0	247	610
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.5	41.2	52.2	6.8	26.5	26.5	7.5	7.5	7.5		30.5	51.0
Effective Green, g (s)	20.0	40.7	51.7	6.3	27.0	27.0	7.0	7.0	7.0		30.0	50.0
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	687	1380	745	112	956	427	118	119	111		537	1314
v/s Ratio Prot	0.14	c0.47	c0.13	0.04	c0.24		0.01	0.01			0.14	c0.23
v/s Ratio Perm						0.09			0.00			
v/c Ratio	0.72	1.16	0.25	0.67	0.88	0.33	0.19	0.19	0.03		0.46	0.46
Uniform Delay, d1	37.4	29.6	13.4	45.8	35.0	29.2	43.8	43.8	43.3		28.4	16.3
Progression Factor	1.08	0.64	0.39	1.00	1.00	1.00	1.00	1.00	1.00		1.32	1.44
Incremental Delay, d2	3.3	76.6	0.1	11.2	11.5	2.0	0.6	0.6	0.1		2.1	0.9
Delay (s)	43.7	95.6	5.3	57.0	46.5	31.3	44.4	44.4	43.4		39.6	24.4
Level of Service	D	F	A	E	D	C	D	D	D		D	C
Approach Delay (s)		72.6			44.8			43.9			27.9	
Approach LOS		E			D			D			C	

Intersection Summary					
HCM Average Control Delay	55.5	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.81				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	82.2%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3531			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3531			1863	
Volume (vph)	55	29	221	0	0	0	0	541	9	0	187	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	569	9	0	197	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	577	0	0	197	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.16			0.11	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.25			0.19	
Uniform Delay, d1	26.8	26.8	21.1					7.5			10.8	
Progression Factor	0.98	0.98	0.90					1.00			1.10	
Incremental Delay, d2	0.3	0.1	0.0					0.3			0.4	
Delay (s)	26.6	26.4	19.1					7.8			12.3	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.1			0.0			7.8			12.3	
Approach LOS		C			A			A			B	

Intersection Summary					
HCM Average Control Delay	12.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.20				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	25.2%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3337		1770	3485		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3337		1770	3485		1770	1839		1770	1863	1583
Volume (vph)	405	504	312	36	556	63	337	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	531	328	38	585	66	355	286	27	32	306	115
RTOR Reduction (vph)	0	86	0	0	8	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	773	0	38	643	0	355	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.5	37.3		5.7	22.5		22.5	22.5		19.5	19.5	19.5
Effective Green, g (s)	20.0	37.8		5.2	23.0		22.0	22.0		19.0	19.0	19.0
Actuated g/C Ratio	0.20	0.38		0.05	0.23		0.22	0.22		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	354	1261		92	802		389	405		336	354	301
v/s Ratio Prot	c0.24	0.23		0.02	c0.18		c0.20	0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.20	0.61		0.41	0.80		0.91	0.77		0.10	0.86	0.07
Uniform Delay, d1	40.0	25.2		45.9	36.3		38.1	36.6		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.02	1.01		0.75	0.80	1.33
Incremental Delay, d2	115.4	2.2		3.0	8.3		25.1	8.3		0.1	17.7	0.1
Delay (s)	155.4	27.4		48.9	44.6		63.8	45.4		25.1	49.1	44.2
Level of Service	F	C		D	D		E	D		C	D	D
Approach Delay (s)		69.8			44.9			55.2			46.2	
Approach LOS		E			D			E			D	

Intersection Summary					
HCM Average Control Delay	57.7	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.94				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	87.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3389		1770	3518		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3389		1770	3518		1770	3497		1770	3487	
Volume (vph)	103	324	127	105	532	22	125	706	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	341	134	111	560	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	44	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	431	0	111	580	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.7		10.8	21.5		12.5	48.3		7.2	43.0	
Effective Green, g (s)	7.0	19.2		9.8	22.0		11.5	48.8		6.2	43.5	
Actuated g/C Ratio	0.07	0.19		0.10	0.22		0.12	0.49		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	651		173	774		204	1707		110	1517	
v/s Ratio Prot	c0.06	0.13		0.06	c0.16		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.66		0.64	0.75		0.65	0.47		0.47	0.68	
Uniform Delay, d1	46.1	37.4		43.4	36.4		42.3	17.0		45.3	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.5		7.9	4.0		6.9	0.9		3.2	2.5	
Delay (s)	90.2	39.9		51.3	40.4		49.2	17.9		48.5	25.2	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.2			42.2			22.3			26.3	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	32.5	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	69.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3418		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	292	86	83	417	324	117	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	307	91	87	439	341	123	395	45	101	151	9
RTOR Reduction (vph)	0	24	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	374	0	87	439	129	123	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1128		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.07	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.33		0.67	0.33	0.22	0.27	0.93			0.78	
Uniform Delay, d1	48.1	25.2		45.2	22.2	21.1	29.8	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.8		11.9	0.7	0.8	0.2	25.3			11.1	
Delay (s)	60.4	26.0		57.1	22.8	21.9	30.1	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.1			25.9			54.8			50.1	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	37.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3455		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	67	57	770	245	143	334	40	179	256	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	71	60	811	258	151	352	42	188	269	11
RTOR Reduction (vph)	0	13	0	0	0	138	0	0	31	0	2	0
Lane Group Flow (vph)	29	432	0	60	811	120	151	352	11	188	278	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.0		7.1	46.6	46.6	12.6	25.9	25.9	8.5	21.8	
Effective Green, g (s)	4.0	44.0		6.6	46.6	46.6	12.1	25.4	25.4	8.0	21.3	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.21	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1520		117	1649	738	214	473	402	142	394	
v/s Ratio Prot	0.02	0.13		c0.03	c0.23		c0.09	c0.19		c0.11	0.15	
v/s Ratio Perm						0.08			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.16	0.71	0.74	0.03	1.32	0.71	
Uniform Delay, d1	46.8	17.9		45.1	18.5	15.4	42.2	34.3	28.0	46.0	36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.84	
Incremental Delay, d2	2.8	0.5		2.8	1.1	0.5	9.4	5.9	0.0	183.3	4.8	
Delay (s)	49.6	18.4		48.0	19.5	15.9	51.6	40.2	28.0	230.3	35.5	
Level of Service	D	B		D	B	B	D	D	C	F	D	
Approach Delay (s)		20.3			20.2			42.5			113.8	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM Average Control Delay	41.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	531	16	90	1048	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	559	17	95	1103	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1128			576			1364	1938	288	1722	1934	564
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1128			576			1364	1938	288	1722	1934	564
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			90			70	76	89	94	94	100
cM capacity (veh/h)	615			994			91	56	709	37	56	469

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	373	203	95	735	393	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	615	1700	1700	994	1700	1700	81	365	55
Volume to Capacity	0.04	0.22	0.12	0.10	0.43	0.23	0.42	0.23	0.11
Queue Length 95th (ft)	3	0	0	8	0	0	42	22	9
Control Delay (s)	11.1	0.0	0.0	9.0	0.0	0.0	78.5	17.8	78.5
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			35.3		78.5
Approach LOS							E		F

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3463		1770	3507			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3463		1770	3507			1810	1583		1408	
Volume (vph)	3	512	86	122	850	54	244	178	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	539	91	128	895	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	618	0	128	948	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.1		11.1	49.3			26.5	26.5		8.8	
Effective Green, g (s)	0.4	39.1		10.6	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.39		0.11	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1354		188	1729			471	412		117	
v/s Ratio Prot	0.00	c0.18		c0.07	c0.27			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.46		0.68	0.55			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.6		43.1	17.6			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.98	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.1		4.5	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.7		46.6	11.1			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.9			15.3			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	28.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3360		1770	3392		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3360		1770	3392		3433	3535		1770	3509	
Volume (vph)	98	365	185	32	588	225	371	961	8	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	384	195	34	619	237	391	1012	8	175	1072	64
RTOR Reduction (vph)	0	63	0	0	36	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	516	0	34	820	0	391	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	31.1		7.1	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	30.1		6.1	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.30		0.06	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	1011		108	957		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.51		0.31	0.86		0.81	0.82		0.78	0.95	
Uniform Delay, d1	44.9	28.9		44.9	34.0		41.7	29.5		42.4	32.3	
Progression Factor	1.50	1.28		1.12	1.05		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.3		0.6	6.8		9.6	6.1		15.3	17.2	
Delay (s)	80.9	37.1		51.1	42.7		51.3	35.6		57.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		43.7			43.0			40.0			50.6	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	44.4	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	82.9%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3500			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3506		1770	3500			3169			2905	
Volume (vph)	58	458	30	111	743	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	482	32	117	782	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	505	0	117	835	0	0	195	0	0	367	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		166	1883			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.24							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.44			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.83	1.15		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.7	0.4		10.6	0.8			0.4			5.2	
Delay (s)	38.1	9.0		32.5	7.8			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.1			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	14.6	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.50				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	56.8%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	1.00			0.94			0.95			0.89	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	1854			1738			1728			1643	
Flt Permitted	0.44	1.00			0.98			0.92			0.95	
Satd. Flow (perm)	819	1854			1714			1620			1566	
Volume (vph)	468	58	2	8	83	84	2	1	2	49	4	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	493	61	2	8	87	88	2	1	2	52	4	256
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	197	0
Lane Group Flow (vph)	493	62	0	0	120	0	0	3	0	0	115	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.8	20.8			6.5			8.6			8.6	
Effective Green, g (s)	20.8	20.8			6.5			8.6			8.6	
Actuated g/C Ratio	0.56	0.56			0.17			0.23			0.23	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	717	1031			298			373			360	
v/s Ratio Prot	c0.19	0.03										
v/s Ratio Perm	c0.19				0.07			0.00			c0.07	
v/c Ratio	0.69	0.06			0.40			0.01			0.32	
Uniform Delay, d1	5.9	3.8			13.7			11.1			12.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.8	0.0			0.9			0.0			0.5	
Delay (s)	8.6	3.8			14.6			11.1			12.5	
Level of Service	A	A			B			B			B	
Approach Delay (s)		8.1			14.6			11.1			12.5	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3510			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3510			3494	
Volume (vph)	77	193	12	112	289	20	0	1237	72	0	1134	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1302	76	0	1194	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1374	0	0	1299	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2046			2037	
v/s Ratio Prot					c0.13			c0.39			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.67			0.64	
Uniform Delay, d1		44.0			41.9			15.0			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.8			1.5	
Delay (s)		57.5			47.6			16.8			16.1	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.8			16.1	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3256			5077	
Volume (vph)	0	0	0	65	656	814	12	646	0	0	1180	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	680	0	0	1242	13
RTOR Reduction (vph)	0	0	0	0	0	137	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	720	0	693	0	0	1254	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1791			2792	
v/s Ratio Prot					0.22						c0.25	
v/s Ratio Perm						c0.45		0.21				
v/c Ratio					0.58	1.23		0.39			0.45	
Uniform Delay, d1					25.3	31.5		12.9			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	117.6		0.6			0.5	
Delay (s)					25.7	149.1		13.5			14.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			91.1			13.5			14.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	48.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	75.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3498		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3498		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	640	54	532	681	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	674	57	560	717	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	724	0	560	717	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1514		638	2391	
v/s Ratio Prot		c0.15						c0.21		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.48		0.88	0.30	
Uniform Delay, d1		25.6						14.2		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.1		12.6	0.0	
Delay (s)		28.2						15.3		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.3			20.3	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3427		1770	3498		1770	3427		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3427		1770	3498		1770	3427		1770	1863	1583
Volume (vph)	300	794	213	148	903	76	211	520	140	151	387	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	224	156	951	80	222	547	147	159	407	533
RTOR Reduction (vph)	0	22	0	0	6	0	0	22	0	0	0	290
Lane Group Flow (vph)	316	1038	0	156	1025	0	222	672	0	159	407	243
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	38.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1221		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.13	c0.20		0.09	c0.22	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.69	1.08		0.45	1.09	0.77
Uniform Delay, d1	43.5	32.7		47.1	39.6		42.1	45.0		38.7	44.0	41.6
Progression Factor	1.00	1.00		1.18	0.91		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.5		1.5	25.7		4.3	55.0		0.9	73.3	10.5
Delay (s)	72.8	40.2		57.1	61.8		46.4	100.5		39.6	117.3	52.1
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.7			61.2			87.4			74.4	
Approach LOS		D			E			F			E	

Intersection Summary				
HCM Average Control Delay	65.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	89.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3438		1770	3481		1770	3459	
Flt Permitted	0.16	1.00			0.58		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	292	3382			2017		1770	3481		1770	3459	
Volume (vph)	202	684	288	101	702	149	279	1278	159	191	1140	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	106	739	157	294	1345	167	201	1200	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	9	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	988	0	294	1503	0	201	1400	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	127	1476			880		274	1108		241	1038	
v/s Ratio Prot		0.29					0.17	c0.43		0.11	c0.40	
v/s Ratio Perm	c0.73				0.49							
v/c Ratio	1.68	0.66			1.12		1.07	1.36		0.83	1.35	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.09	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	325.2	0.7			70.0		75.1	166.4		21.3	163.3	
Delay (s)	358.9	27.3			101.0		121.6	203.9		67.6	201.8	
Level of Service	F	C			F		F	F		E	F	
Approach Delay (s)		84.4			101.0			190.5			185.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	149.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	122.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	198	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	208	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	643	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	643	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	80	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	280	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	212	2
Volume Left	1	197	2	1
Volume Right	0	0	208	0
cSH	1599	1596	1038	346
Volume to Capacity	0.00	0.12	0.20	0.01
Queue Length 95th (ft)	0	11	19	0
Control Delay (s)	0.4	7.0	9.4	15.5
Lane LOS	A	A	A	C
Approach Delay (s)	0.4	7.0	9.4	15.5
Approach LOS			A	C

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 4 PM Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	158	79	6	205	106	501	10	447	316	93	484	110	387	21	37	374	388	43

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	243	812	773	687	408	411	431
Delay	56.6	11.5	89.5	47.3	2.5	223.0	276.0
LOS	E	B	F	D	A	F	F

HCM Average Control Delay	**128.1**
HCM Level of Service	**F**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.88			1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1632			1861	1583	1770	1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.87	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1844		1770	1632			1613	1583	1770	1811	
Volume (vph)	158	79	6	205	106	501	10	447	316	93	484	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	166	83	6	216	112	527	11	471	333	98	509	116
RTOR Reduction (vph)	0	2	0	0	132	0	0	0	216	0	7	0
Lane Group Flow (vph)	166	87	0	216	507	0	0	482	117	98	618	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	15.5	15.5		46.0	46.0			32.0	32.0	11.0	47.0	
Effective Green, g (s)	15.5	15.5		46.0	46.0			32.0	32.0	11.0	47.0	
Actuated g/C Ratio	0.13	0.13		0.38	0.38			0.27	0.27	0.09	0.39	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	228	237		676	623			428	420	162	706	
v/s Ratio Prot	c0.09	0.05		0.12	c0.31					0.06	c0.34	
v/s Ratio Perm								c0.30	0.07			
v/c Ratio	0.73	0.37		0.32	0.81			1.13	0.28	0.60	0.88	
Uniform Delay, d1	50.5	48.0		26.2	33.4			44.2	35.1	52.7	34.0	
Progression Factor	1.00	1.00		0.26	0.37			1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.4	0.7		0.0	0.7			82.6	0.3	4.3	11.7	
Delay (s)	60.8	48.7		6.9	13.0			126.8	35.4	57.0	45.7	
Level of Service	E	D		A	B			F	D	E	D	
Approach Delay (s)		56.6			11.5			89.5			47.3	
Approach LOS		E			B			F			D	

Intersection Summary				
HCM Average Control Delay	49.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	114.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1852		1770	1863	1759	
Flt Permitted	1.00		0.19	1.00	0.96	
Satd. Flow (perm)	1852		355	1863	1759	
Volume (vph)	468	21	37	425	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	493	22	39	447	408	45
RTOR Reduction (vph)	1	0	0	0	3	0
Lane Group Flow (vph)	514	0	39	447	450	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	91.5		21.0	21.0	21.0	
Effective Green, g (s)	91.5		21.0	21.0	21.0	
Actuated g/C Ratio	0.76		0.17	0.17	0.17	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1406		62	325	307	
v/s Ratio Prot	c0.28			c0.24	c0.26	
v/s Ratio Perm			0.11			
v/c Ratio	0.37		0.63	1.38	1.46	
Uniform Delay, d1	4.8		46.1	49.8	49.8	
Progression Factor	0.50		1.00	1.00	1.00	
Incremental Delay, d2	0.1		16.0	187.2	226.2	
Delay (s)	2.5		62.1	237.0	276.0	
Level of Service	A		E	F	F	
Approach Delay (s)	2.5			223.0	276.0	
Approach LOS	A			F	F	

Intersection Summary				
HCM Average Control Delay	161.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	120.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1778			1811		1770	1843		1770	1748	
Flt Permitted		0.77			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1390			1587		1770	1843		1770	1748	
Volume (vph)	225	255	68	36	137	20	163	712	44	19	404	204
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	268	72	38	144	21	172	749	46	20	425	215
RTOR Reduction (vph)	0	9	0	0	8	0	0	3	0	0	33	0
Lane Group Flow (vph)	0	568	0	0	195	0	172	792	0	20	607	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		404			462		222	875		29	639	
v/s Ratio Prot							c0.10	c0.43		0.01	0.35	
v/s Ratio Perm		c0.41			0.12							
v/c Ratio		1.41			0.42		0.77	0.90		0.69	0.95	
Uniform Delay, d1		19.5			15.8		23.3	13.3		26.9	17.0	
Progression Factor		1.00			1.00		0.91	1.07		0.99	1.12	
Incremental Delay, d2		196.8			0.5		13.4	13.3		39.8	21.7	
Delay (s)		216.3			16.2		34.7	27.5		66.4	40.7	
Level of Service		F			B		C	C		E	D	
Approach Delay (s)		216.3			16.2			28.8			41.5	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	76.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	202	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	213	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	301	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.16	-0.09	0.04
Departure Headway (s)	4.9	5.4	4.6	4.9
Degree Utilization, x	0.11	0.20	0.39	0.27
Capacity (veh/h)	645	604	741	692
Control Delay (s)	8.5	9.7	10.6	9.7
Approach Delay (s)	8.5	9.7	10.6	9.7
Approach LOS	A	A	B	A

Intersection Summary			
Delay	9.9		
HCM Level of Service	A		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	120	47	25	643	566	134
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	49	26	677	596	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	1396	666	737			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1481	595	680			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	88	96			
cM capacity (veh/h)	110	415	751			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	176	26	677	737
Volume Left	126	26	0	0
Volume Right	49	0	0	141
cSH	138	751	1700	1700
Volume to Capacity	1.27	0.04	0.40	0.43
Queue Length 95th (ft)	270	3	0	0
Control Delay (s)	228.3	10.0	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	228.3	0.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		25.0	
Intersection Capacity Utilization		54.1%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1660		1770	3539	1452		3482	
Flt Permitted		0.97	1.00	0.95	0.96		0.22	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1660		413	3539	1452		3260	
Volume (vph)	12	5	95	861	63	53	130	375	325	22	650	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	906	66	56	137	395	342	23	684	71
RTOR Reduction (vph)	0	0	78	0	4	0	0	0	211	0	7	0
Lane Group Flow (vph)	0	18	22	528	496	0	137	395	131	0	771	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		7.1	7.1	49.2	49.2		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.6	6.6	49.2	49.2		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		108	95	752	742		158	1358	557		1251	
v/s Ratio Prot		0.01		c0.31	0.30			0.11				
v/s Ratio Perm			c0.01				c0.33		0.09		0.24	
v/c Ratio		0.17	0.23	0.70	0.67		0.87	0.29	0.24		0.62	
Uniform Delay, d1		49.1	49.3	24.5	24.0		31.3	23.5	23.0		27.4	
Progression Factor		1.00	1.00	0.32	0.30		1.20	0.89	2.88		1.00	
Incremental Delay, d2		0.5	0.9	4.0	3.5		26.4	0.3	0.5		2.3	
Delay (s)		49.6	50.2	11.7	10.6		63.9	21.2	66.6		29.6	
Level of Service		D	D	B	B		E	C	E		C	
Approach Delay (s)		50.1			11.2			45.6			29.6	
Approach LOS		D			B			D			C	

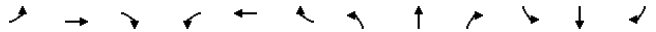
Intersection Summary				
HCM Average Control Delay	28.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	311	34	474	684	329	503
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	327	36	499	720	346	529
RTOR Reduction (vph)	0	18	0	0	0	176
Lane Group Flow (vph)	327	18	499	720	346	353
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	26.6	54.6	24.5	76.4	48.4	26.6
Effective Green, g (s)	26.1	54.1	24.0	75.9	47.9	26.1
Actuated g/C Ratio	0.24	0.49	0.22	0.69	0.44	0.24
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	420	779	749	1285	811	376
v/s Ratio Prot	0.18	0.01	c0.15	c0.39	0.19	c0.22
v/s Ratio Perm						
v/c Ratio	0.78	0.02	0.67	0.56	0.43	0.94
Uniform Delay, d1	39.2	14.4	39.3	8.6	21.5	41.2
Progression Factor	0.67	0.47	0.75	0.29	1.00	1.00
Incremental Delay, d2	8.1	0.0	1.9	1.5	1.6	30.7
Delay (s)	34.5	6.8	31.3	4.0	23.2	71.9
Level of Service	C	A	C	A	C	E
Approach Delay (s)	31.8			15.2	52.6	
Approach LOS	C			B	D	

Intersection Summary				
HCM Average Control Delay	31.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	598	14	0	11	734	1668	269	595	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	629	15	0	12	773	1756	283	626	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	315	329	0	12	773	1756	283	673	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.2	16.2	16.2	21.0	21.0		1.2	24.4	94.7	17.6	40.8	
Effective Green, g (s)	15.7	15.7	15.7	21.0	21.0		0.7	24.9	94.7	17.1	41.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	293	309	262	373	375		13	931	1583	320	798	
v/s Ratio Prot	0.10	0.21		0.19	0.19		0.01	0.22		0.16	0.37	
v/s Ratio Perm			0.03						c1.11			
v/c Ratio	0.62	1.26	0.17	0.84	0.88		0.92	0.83	1.11	0.88	0.84	
Uniform Delay, d1	36.7	39.5	33.9	35.3	35.6		47.0	32.9	47.4	37.8	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	140.1	0.1	15.7	19.8		205.3	6.2	58.8	23.3	8.0	
Delay (s)	39.4	179.6	34.0	51.0	55.5		252.2	39.2	106.2	61.1	31.8	
Level of Service	D	F	C	D	E		F	D	F	E	C	
Approach Delay (s)		125.0			53.3			86.5			40.5	
Approach LOS		F			D			F			D	

Intersection Summary				
HCM Average Control Delay	77.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	88.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2926	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2926	1399				3433		1583
Volume (vph)	142	429	603	0	569	2170	0	0	0	951	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	2284	0	0	0	1001	0	361
RTOR Reduction (vph)	0	225	0	0	248	0	0	0	0	0	0	200
Lane Group Flow (vph)	149	862	0	0	1268	1367	0	0	0	1001	0	161
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.2			43.2	110.0				34.3		34.3
Effective Green, g (s)	20.0	67.2			43.2	110.0				34.8		34.8
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1973			1149	1399				1086		501
v/s Ratio Prot	0.08	0.27			c0.43							0.10
v/s Ratio Perm						c0.98				0.29		
v/c Ratio	0.46	0.44			1.16dr	0.98				0.92		0.32
Uniform Delay, d1	40.2	11.4			33.4	0.0				36.3		28.6
Progression Factor	1.00	1.00			0.76	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			48.2	3.7				12.5		0.3
Delay (s)	40.6	12.1			73.6	3.7				48.8		28.9
Level of Service	D	B			E	A				D		C
Approach Delay (s)		15.5			40.4			0.0			43.5	
Approach LOS		B			D			A			D	

Intersection Summary				
HCM Average Control Delay	35.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	86.2%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1508	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1508	659			
Volume (vph)	153	1226	0	0	2137	505	603	226	1251	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1226	0	0	2137	505	603	226	1251	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	90	10	0	0	0
Lane Group Flow (vph)	153	1226	0	0	2137	227	603	761	616	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	507	335			
v/s Ratio Prot	0.09	c0.34			c0.46		0.36	0.50	c0.93			
v/s Ratio Perm						0.17						
v/c Ratio	0.45	0.82			1.27	0.46	1.07	1.50	1.84			
Uniform Delay, d1	39.4	28.4			35.0	26.8	36.5	36.5	27.0			
Progression Factor	1.53	0.39			0.95	1.19	1.00	1.00	1.00			
Incremental Delay, d2	2.7	3.3			121.2	0.8	57.1	235.4	389.1			
Delay (s)	63.2	14.4			154.5	32.6	93.6	271.9	416.1			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		19.8			131.2			263.6			0.0	
Approach LOS		B			F			F			A	

Intersection Summary				
HCM Average Control Delay	151.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.60			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1803	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1803	2628
Volume (vph)	541	1191	745	325	1274	300	132	16	66	328	163	1128
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	541	1191	745	325	1274	300	132	16	66	328	163	1128
RTOR Reduction (vph)	0	0	143	0	0	32	0	0	58	0	0	92
Lane Group Flow (vph)	541	1191	602	325	1274	268	72	76	8	0	491	1036
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		492	1123
v/s Ratio Prot	0.16	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.27	0.39
v/s Ratio Perm						0.17			0.01			
v/c Ratio	1.02	1.17	1.07	1.19	1.20	0.56	0.34	0.35	0.04		1.00	0.92
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	32.4	43.8	43.8	42.1		40.0	29.8
Progression Factor	1.19	1.02	1.07	1.08	1.08	1.15	1.02	1.02	2.08		0.94	0.72
Incremental Delay, d2	16.8	78.1	33.8	107.3	96.6	3.5	0.7	0.7	0.1		34.8	11.0
Delay (s)	72.0	117.3	65.4	157.4	138.4	40.7	45.5	45.6	87.7		72.4	32.6
Level of Service	E	F	E	F	F	D	D	D	F		E	C
Approach Delay (s)		91.8			126.2			58.5			44.7	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	88.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	788	0	0	0	0	1148	25	0	357	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1208	26	0	376	0
RTOR Reduction (vph)	0	0	151	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	678	0	0	0	0	1233	0	0	376	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.24					c0.35			0.20	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.41					0.60			0.62	
Uniform Delay, d1	25.4	25.4	11.6					14.5			31.2	
Progression Factor	1.22	1.20	1.51					1.00			1.19	
Incremental Delay, d2	0.7	0.3	0.1					1.3			4.3	
Delay (s)	31.7	30.7	17.7					15.7			41.4	
Level of Service	C	C	B					B			D	
Approach Delay (s)		21.2			0.0			15.7			41.4	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3346		1770	3481		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3346		1770	3481		1770	1849		1770	1863	1540
Volume (vph)	206	875	333	23	768	59	571	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	921	351	24	808	62	601	633	28	73	314	158
RTOR Reduction (vph)	0	35	0	0	5	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1237	0	24	865	0	601	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	900		55	728		624	652		357	376	311
v/s Ratio Prot	0.12	c0.37		0.01	c0.25		0.34	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.37		0.44	1.19		0.96	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		34.9	35.6		36.5	42.1	35.8
Progression Factor	1.22	1.03		1.00	1.00		1.08	1.08		1.23	1.18	2.42
Incremental Delay, d2	186.0	174.2		5.5	98.3		25.1	36.3		0.2	13.0	0.1
Delay (s)	246.9	215.6		57.8	141.8		62.8	74.7		45.2	62.8	86.8
Level of Service	F	F		E	F		E	E		D	E	F
Approach Delay (s)		220.1			139.5			69.0			67.4	
Approach LOS		F			F			E			E	

Intersection Summary					
HCM Average Control Delay	137.6	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.08				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	99.5%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3434		1770	3485		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3434		1770	3485		1770	3494		1770	3481	
Volume (vph)	181	761	189	106	540	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	801	199	112	568	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	24	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	976	0	112	622	0	195	1585	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.5		8.4	22.9		13.1	31.2		9.9	28.0	
Effective Green, g (s)	10.0	26.0		7.4	23.4		12.1	31.7		8.9	28.5	
Actuated g/C Ratio	0.11	0.29		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	992		146	906		238	1231		175	1102	
v/s Ratio Prot	c0.11	c0.28		0.06	0.18		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.98		0.77	0.69		0.82	1.29		0.67	1.32	
Uniform Delay, d1	39.8	31.8		40.5	30.0		37.9	29.2		39.2	30.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	24.5		21.1	2.2		19.3	135.6		9.8	148.5	
Delay (s)	94.5	56.2		61.6	32.2		57.2	164.8		49.0	179.3	
Level of Service	F	E		E	C		E	F		D	F	
Approach Delay (s)		62.4			36.6			153.0			169.5	
Approach LOS		E			D			F			F	

Intersection Summary					
HCM Average Control Delay	121.2	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	95.5%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3379		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3379		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	720	251	158	761	107	259	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	758	264	166	801	113	273	362	178	273	418	20
RTOR Reduction (vph)	0	35	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	987	0	166	801	29	273	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	777		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.29		c0.09	c0.23		0.15	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.27		1.34	0.87	0.07	0.57	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.3	27.8	31.5	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	131.9		196.8	10.8	0.4	1.4	73.9			212.2	
Delay (s)	50.8	170.4		243.3	46.0	28.2	32.9	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		166.6			74.5			84.3			248.7	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	137.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.32			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	115.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3453		1770	3539	1494	1770	1863	1520	1770	1834	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3453		1770	3539	1494	1770	1863	1520	1770	1834	
Volume (vph)	46	928	142	143	794	263	219	396	133	357	591	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	149	151	836	277	231	417	140	376	622	54
RTOR Reduction (vph)	0	12	0	0	0	171	0	0	99	0	3	0
Lane Group Flow (vph)	48	1114	0	151	836	106	231	417	41	376	673	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.5	29.5	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1088		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.21	c0.37	
v/s Ratio Perm						0.07			0.03			
v/c Ratio	0.56	1.02		0.74	0.62	0.19	1.09	0.77	0.09	1.77	1.27	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.6	44.0	32.5	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	6.8	33.6		12.8	2.1	0.7	87.8	6.5	0.1	356.3	126.0	
Delay (s)	53.4	67.8		55.6	27.1	21.3	131.8	39.0	26.0	398.3	159.6	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		67.3			29.2			63.9			244.9	
Approach LOS		E			C			E			F	

Intersection Summary				
HCM Average Control Delay	99.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1342	44	96	1219	13	33	12	98	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1413	46	101	1283	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1297			1459			2339	2981	729	2354	2997	648
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1297			1459			2339	2981	729	2354	2997	648
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			78			0	0	72	0	16	98
cM capacity (veh/h)	530			459			5	10	365	0	10	413

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	942	517	101	855	441	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	530	1700	1700	459	1700	1700	5	122	0
Volume to Capacity	0.04	0.55	0.30	0.22	0.50	0.26	8.10	0.90	Err
Queue Length 95th (ft)	3	0	0	21	0	0	Err	142	Err
Control Delay (s)	12.1	0.0	0.0	15.0	0.0	0.0	Err	123.3	Err
Lane LOS	B			C			F	F	F
Approach Delay (s)	0.2			1.1			2816.7		Err
Approach LOS							F		F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3425		1770	3495			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3425		1770	3495			1814	1555		1814	
Volume (vph)	32	1235	216	158	1053	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1300	227	166	1108	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1515	0	166	1168	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1096		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.44		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.38		0.78	0.93			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	31.0			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.59			1.00	1.00		1.00	
Incremental Delay, d2	0.6	177.7		1.7	1.7			101.1	0.6		10.7	
Delay (s)	43.6	211.7		52.0	20.0			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		208.0			23.9			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary					
HCM Average Control Delay	114.4	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.16				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	106.0%	ICU Level of Service	G		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3304		1770	3393		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3304		1770	3393		3433	3532		1770	3482	
Volume (vph)	223	875	457	47	610	187	550	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	921	481	49	642	197	579	1415	16	298	1511	123
RTOR Reduction (vph)	0	65	0	0	29	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1337	0	49	810	0	579	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		5.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	955		81	645		446	1286		250	1306	
v/s Ratio Prot	c0.13	c0.40		0.03	0.24		0.17	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.40		0.60	1.26		1.30	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.60	0.90		0.97	0.97		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	180.4		7.5	126.1		149.9	61.8		118.9	117.4	
Delay (s)	30.2	212.5		53.0	165.2		193.4	93.6		161.8	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		186.4			159.0			122.4			150.7	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	152.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.21			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	115.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3461			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3461			3110			2395	
Volume (vph)	47	1010	17	45	678	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1063	18	47	714	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	18	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1079	0	47	800	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1793			603			465	
v/s Ratio Prot	c0.03	c0.31		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.59		0.58	0.45			0.62			0.82	
Uniform Delay, d1	23.3	8.3		23.4	7.6			18.4			19.3	
Progression Factor	1.03	1.42		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.8			1.9			11.2	
Delay (s)	24.5	11.9		30.0	8.4			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.5			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	15.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	80.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.94			0.96			0.90	
Flt Protected	0.95	1.00			0.99			0.99			0.99	
Satd. Flow (prot)	1770	1833			1734			1768			1666	
Flt Permitted	0.28	1.00			0.87			0.90			0.89	
Satd. Flow (perm)	518	1833			1537			1601			1493	
Volume (vph)	560	95	11	86	105	140	19	83	50	167	59	562
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	589	100	12	91	111	147	20	87	53	176	62	592
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	100	0
Lane Group Flow (vph)	589	107	0	0	320	0	0	140	0	0	730	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			729			680	
v/s Ratio Prot	c0.25	0.06										
v/s Ratio Perm	c0.27				0.21			0.09			c0.49	
v/c Ratio	1.15	0.13			1.10			0.19			1.07	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	86.5	0.1			83.2			0.1			56.1	
Delay (s)	107.8	14.2			119.7			14.8			80.6	
Level of Service	F	B			F			B			F	
Approach Delay (s)		92.8			119.7			14.8			80.6	
Approach LOS		F			F			B			F	

Intersection Summary				
HCM Average Control Delay	86.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	118.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00			0.97	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1760			1801	1583		1787			1805	
Flt Permitted	0.95	1.00			0.97	1.00		0.67			0.97	
Satd. Flow (perm)	1770	1760			1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	748	0	0	574	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	17.6	17.6			8.5	8.5		31.5			31.5	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary				
HCM Average Control Delay	86.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	110.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	216	36	0	1629	92	0	1835	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1715	97	0	1932	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1808	0	0	2044	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.52			c0.58	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.92			1.04	
Uniform Delay, d1		43.5			42.5			20.8			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			8.2			30.4	
Delay (s)		120.0			47.1			29.0			53.4	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			29.0			53.4	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	50.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2533			5077	
Volume (vph)	0	0	0	64	561	803	49	1119	0	0	1854	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	591	845	52	1178	0	0	1952	22
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	786	0	1230	0	0	1973	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1548			3103	
v/s Ratio Prot					0.19						0.39	
v/s Ratio Perm						c0.50		c0.49				
v/c Ratio					0.62	1.66		0.79			0.64	
Uniform Delay, d1					27.1	31.5		13.2			11.1	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	304.1		4.3			1.0	
Delay (s)					27.9	335.6		17.5			12.1	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			200.9			17.5			12.1	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	73.8	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	91.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3504		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3504		3433	3539	
Volume (vph)	28	861	78	0	0	0	0	1086	78	927	1026	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1143	82	976	1080	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1220	0	976	1080	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						38.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.35		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2381	
v/s Ratio Prot		c0.29						c0.35		c0.28	0.31	
v/s Ratio Perm												
v/c Ratio		1.14						0.98		1.01	0.45	
Uniform Delay, d1		41.0						35.2		39.5	8.5	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						21.7		31.2	0.1	
Delay (s)		116.5						56.9		70.7	8.5	
Level of Service		F						E		E	A	
Approach Delay (s)		116.5			0.0			56.9			38.1	
Approach LOS		F			A			E			D	

Intersection Summary				
HCM Average Control Delay	62.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	181	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	197	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	532	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	532	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	82	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	345	531	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	200	12
Volume Left	0	153	0	1
Volume Right	0	1	197	3
cSH	1604	1605	1050	582
Volume to Capacity	0.00	0.10	0.19	0.02
Queue Length 95th (ft)	0	8	18	2
Control Delay (s)	0.0	6.9	9.2	11.3
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.2	11.3
Approach LOS			A	B

Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	33.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004&1005: 65th/Shellmound/Overland Single Controller

Emeryville Marketplace Redevelopment
2030 Plus Alternative 4 Saturday Peak Hour

Intersection	1004: 65th St & Shellmound St												1005: 65th St & Overland Ave					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBT	EBR	WBL	WBT	NBL	NBR
Volume	116	46	13	214	67	256	13	434	292	90	737	75	147	29	43	158	225	16

Approach	EB	WB	NB	SB	EB	WB	NB
Volume	175	537	739	902	176	201	241
Delay	64.4	8.4	62.7	48.5	1.8	78.0	80.8
LOS	E	A	E	D	A	E	F

HCM Average Control Delay	**60.5**
HCM Level of Service	**E**

NOTE:

Approach Delays computed using Sychro 6.0 with a single controller for these two intersections.

Synchro output sheets are attached.

HCM Calculation does not include WB approach at Intersection of 65th/Shellmound nor the EB approach at 65th/Overland.

Source: Fehr & Peers, 2007

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.88			1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1860	1583	1770	1837	
Flt Permitted	0.95	1.00		0.95	1.00			0.64	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802		1770	1641			1198	1583	1770	1837	
Volume (vph)	116	46	13	214	67	256	13	434	292	90	737	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	50	14	233	73	278	14	472	317	98	801	82
RTOR Reduction (vph)	0	8	0	0	106	0	0	0	194	0	3	0
Lane Group Flow (vph)	126	56	0	233	245	0	0	486	123	98	880	0
Turn Type	Split			Split			Perm		Perm	Prot		
Protected Phases	2	2		3 9	3 9			8		7	4	
Permitted Phases							8		8			
Actuated Green, G (s)	10.4	10.4		34.7	34.7			44.6	44.6	8.9	57.5	
Effective Green, g (s)	10.4	10.4		34.7	34.7			44.6	44.6	8.9	57.5	
Actuated g/C Ratio	0.09	0.09		0.30	0.30			0.39	0.39	0.08	0.50	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.5	2.5						2.5	2.5	2.0	2.5	
Lane Grp Cap (vph)	161	164		536	497			466	616	137	922	
v/s Ratio Prot	c0.07	0.03		0.13	c0.15					0.06	c0.48	
v/s Ratio Perm								c0.41	0.08			
v/c Ratio	0.78	0.34		0.43	0.49			1.04	0.20	0.72	0.95	
Uniform Delay, d1	51.0	48.9		32.1	32.7			35.0	23.2	51.6	27.3	
Progression Factor	1.00	1.00		0.42	0.15			1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.8	0.9		0.2	0.2			53.3	0.1	13.7	19.4	
Delay (s)	71.8	49.8		13.6	5.0			88.3	23.3	65.3	46.7	
Level of Service	E	D		B	A			F	C	E	D	
Approach Delay (s)		64.4			8.4			62.7			48.5	
Approach LOS		E			A			E			D	

Intersection Summary				
HCM Average Control Delay	45.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	106.0%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Alt#4 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1821		1770	1863	1764	
Flt Permitted	1.00		0.32	1.00	0.96	
Satd. Flow (perm)	1821		601	1863	1764	
Volume (vph)	147	29	43	158	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	32	47	172	245	17
RTOR Reduction (vph)	6	0	0	0	2	0
Lane Group Flow (vph)	186	0	47	172	260	0
Turn Type			Perm			
Protected Phases	10 9 8 7			6	3	
Permitted Phases			6			
Actuated Green, G (s)	88.3		12.4	12.4	18.3	
Effective Green, g (s)	88.3		12.4	12.4	18.3	
Actuated g/C Ratio	0.77		0.11	0.11	0.16	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			2.5	2.5	2.0	
Lane Grp Cap (vph)	1403		65	202	282	
v/s Ratio Prot	c0.10			c0.09	c0.15	
v/s Ratio Perm			0.08			
v/c Ratio	0.13		0.72	0.85	0.92	
Uniform Delay, d1	3.4		49.4	50.2	47.5	
Progression Factor	0.53		1.00	1.00	1.00	
Incremental Delay, d2	0.0		30.8	27.2	33.4	
Delay (s)	1.8		80.3	77.4	80.8	
Level of Service	A		F	E	F	
Approach Delay (s)	1.8			78.0	80.8	
Approach LOS	A			E	F	

Intersection Summary				
HCM Average Control Delay	57.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	165	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	179	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	277	133
Volume Left (vph)	0	108	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.11	-0.16	0.04
Departure Headway (s)	4.5	5.0	4.3	4.6
Degree Utilization, x	0.02	0.18	0.33	0.17
Capacity (veh/h)	704	669	812	738
Control Delay (s)	7.6	9.0	9.4	8.6
Approach Delay (s)	7.6	9.0	9.4	8.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay			9.0	
HCM Level of Service			A	
Intersection Capacity Utilization			36.7%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	112	33	23	670	815	156
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	122	36	25	728	886	170
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.53	0.53	0.53			
vC, conflicting volume	1749	971	1055			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2403	945	1104			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	79	93			
cM capacity (veh/h)	18	170	338			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	25	728	1055
Volume Left	122	25	0	0
Volume Right	36	0	0	170
cSH	23	338	1700	1700
Volume to Capacity	6.94	0.07	0.43	0.62
Queue Length 95th (ft)	Err	6	0	0
Control Delay (s)	Err	16.5	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	0.5		0.0
Approach LOS	F			

Intersection Summary					
Average Delay			801.7		
Intersection Capacity Utilization			67.3%	ICU Level of Service	C
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1648		1770	3539	1488		3479	
Flt Permitted		0.97	1.00	0.95	0.97		0.21	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1648		389	3539	1488		3231	
Volume (vph)	31	22	136	958	78	72	143	356	479	25	563	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	1041	85	78	155	387	521	27	612	68
RTOR Reduction (vph)	0	0	38	0	5	0	0	0	358	0	8	0
Lane Group Flow (vph)	0	58	110	623	576	0	155	387	163	0	699	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	39.0	39.0		35.0	35.0	35.0		35.0	
Effective Green, g (s)		24.5	24.5	39.0	39.0		34.5	34.5	34.5		34.5	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.31	0.31	0.31		0.31	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	596	584		122	1110	467		1013	
v/s Ratio Prot		0.03		c0.37	0.35			0.11				
v/s Ratio Perm			c0.07				c0.40		0.11		0.22	
v/c Ratio		0.14	0.31	1.05	0.99		1.27	0.35	0.35		0.69	
Uniform Delay, d1		34.3	35.7	35.5	35.2		37.7	29.1	29.1		33.1	
Progression Factor		1.00	1.00	0.60	0.59		0.56	0.55	1.32		1.00	
Incremental Delay, d2		0.7	2.3	46.2	30.3		151.0	0.5	1.1		3.9	
Delay (s)		35.1	38.0	67.4	51.2		172.0	16.6	39.4		36.9	
Level of Service		D	D	E	D		F	B	D		D	
Approach Delay (s)		37.2			59.6			50.5			36.9	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	50.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	443	67	691	910	398	432
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	482	73	751	989	433	470
RTOR Reduction (vph)	0	31	0	0	0	20
Lane Group Flow (vph)	482	42	751	989	433	450
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	31.4	63.2	28.3	71.6	39.8	74.7
Effective Green, g (s)	30.9	62.7	27.8	71.1	39.3	74.2
Actuated g/C Ratio	0.28	0.57	0.25	0.65	0.36	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	497	902	868	1204	666	1068
v/s Ratio Prot	c0.27	0.03	0.22	c0.53	0.23	0.28
v/s Ratio Perm						
v/c Ratio	0.97	0.05	0.87	0.82	0.65	0.42
Uniform Delay, d1	39.1	10.4	39.3	14.7	29.6	8.1
Progression Factor	0.57	0.39	0.59	1.85	1.00	1.00
Incremental Delay, d2	28.0	0.0	4.5	3.1	4.9	0.3
Delay (s)	50.5	4.0	27.7	30.2	34.5	8.4
Level of Service	D	A	C	C	C	A
Approach Delay (s)	44.4			29.1	20.9	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Volume (vph)	26	21	7	836	13	16	41	337	1321	135	481	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	909	14	17	45	366	1436	147	523	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	477	462	0	45	366	1436	147	555	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	661	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.10		0.08	0.30	
v/s Ratio Perm			0.00						c0.91			
v/c Ratio	0.38	0.30	0.01	0.84	0.81		0.53	0.35	0.91	0.75	0.84	
Uniform Delay, d1	35.2	35.1	34.7	23.0	22.7		35.1	20.8	0.0	32.6	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	10.1	8.0		2.7	0.1	9.1	13.6	9.1	
Delay (s)	36.4	35.9	34.7	33.0	30.7		37.8	20.9	9.1	46.2	31.2	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			31.9			12.2			34.3	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			2988	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			2988	1399				3433		1583
Volume (vph)	115	309	31	0	418	1595	0	0	0	1077	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1734	0	0	0	1171	0	282
RTOR Reduction (vph)	0	6	0	0	147	0	0	0	0	0	0	150
Lane Group Flow (vph)	125	364	0	0	803	1238	0	0	0	1171	0	132
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	59.5			44.1	110.0				42.0		42.0
Effective Green, g (s)	11.4	59.5			44.1	110.0				42.5		42.5
Actuated g/C Ratio	0.10	0.54			0.40	1.00				0.39		0.39
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1888			1198	1399				1326		612
v/s Ratio Prot	0.07	0.10			0.27							0.08
v/s Ratio Perm						c0.88				0.34		
v/c Ratio	0.68	0.19			0.67	0.88				0.88		0.22
Uniform Delay, d1	47.6	12.9			27.0	0.0				31.4		22.6
Progression Factor	1.00	1.00			0.97	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.9				7.2		0.1
Delay (s)	55.7	13.2			27.1	2.9				38.7		22.7
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.9			13.4			0.0			35.6	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	77.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	123	1262	0	0	1586	491	427	21	1464	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1372	0	0	1724	534	464	23	1591	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	344	0	161	2	0	0	0
Lane Group Flow (vph)	134	1372	0	0	1724	190	464	657	794	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.39			0.37		0.28	0.45	c1.20			
v/s Ratio Perm						0.13						
v/c Ratio	0.77	1.15			1.04	0.37	0.63	1.04	2.04			
Uniform Delay, d1	48.4	36.5			35.4	26.2	24.1	31.0	22.5			
Progression Factor	1.20	0.62			0.98	1.30	1.00	1.00	1.00			
Incremental Delay, d2	14.0	74.1			28.3	1.0	4.1	46.4	477.8			
Delay (s)	72.2	96.6			63.1	35.1	28.2	77.4	500.3			
Level of Service	E	F			E	D	C	E	F			
Approach Delay (s)		94.4			56.5			228.4			0.0	
Approach LOS		F			E			F			A	

Intersection Summary			
HCM Average Control Delay	127.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1814	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1814	2628
Volume (vph)	558	946	1230	350	751	306	227	62	101	306	270	1092
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	607	1028	1337	380	816	333	247	67	110	333	293	1187
RTOR Reduction (vph)	0	50	85	0	0	81	0	0	98	0	0	27
Lane Group Flow (vph)	607	1488	742	380	816	252	153	161	12	0	626	1160
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.18	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.35	0.44
v/s Ratio Perm						0.17			0.01			
v/c Ratio	1.02	1.48	1.42	1.39	0.77	0.55	0.84	0.86	0.07		1.26	0.92
Uniform Delay, d1	45.5	37.5	31.5	46.5	35.0	32.3	48.0	48.2	44.0		40.0	26.4
Progression Factor	1.20	1.03	1.06	1.00	1.00	1.00	1.26	1.26	2.47		0.90	0.66
Incremental Delay, d2	17.7	214.9	191.6	195.1	5.3	4.7	23.7	26.6	0.1		127.2	6.6
Delay (s)	72.3	253.4	224.9	241.6	40.4	37.0	84.3	87.3	108.7		163.1	24.0
Level of Service	E	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		208.5			89.7			91.8			72.0	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	137.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1581	21	0	459	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1718	23	0	499	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1740	0	0	499	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.49			0.27	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.93			0.58	
Uniform Delay, d1	21.7	21.7	25.2					24.2			22.0	
Progression Factor	1.04	1.04	1.10					0.55			0.48	
Incremental Delay, d2	0.7	0.3	3.5					7.4			2.4	
Delay (s)	23.2	23.0	31.2					20.8			12.9	
Level of Service	C	C	C					C			B	
Approach Delay (s)		29.0			0.0			20.8			12.9	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	23.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3335		1770	3508		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3335		1770	3508		1770	1839		1770	1863	1549
Volume (vph)	101	701	386	40	764	38	332	288	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	762	420	43	830	41	361	313	24	40	308	107
RTOR Reduction (vph)	0	102	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1080	0	43	866	0	361	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.5		2.3	17.8		15.3	15.3		14.2	14.2	14.2
Effective Green, g (s)	4.0	19.5		2.3	17.8		15.3	15.3		14.2	14.2	14.2
Actuated g/C Ratio	0.06	0.29		0.03	0.26		0.23	0.23		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	105	966		60	928		402	418		373	393	327
v/s Ratio Prot	c0.06	c0.32		0.02	0.25		c0.20	0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.05	1.12		0.72	0.93		0.90	0.80		0.11	0.78	0.07
Uniform Delay, d1	31.6	23.9		32.2	24.2		25.2	24.5		21.4	25.1	21.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	101.2	67.0		33.3	15.8		22.0	10.1		0.1	9.8	0.1
Delay (s)	132.9	90.9		65.5	39.9		47.2	34.7		21.6	34.9	21.3
Level of Service	F	F		E	D		D	C		C	C	C
Approach Delay (s)		94.4			41.1			41.2			30.6	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM Average Control Delay	60.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3422		1770	3520			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3422		1770	3520			1809	1555		1785	
Volume (vph)	19	1249	226	175	1343	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1358	246	190	1460	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1591	0	190	1494	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1228		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.46		0.11	c0.42			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.30		0.97	0.92			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	25.4			37.8	31.0		39.8	
Progression Factor	0.94	0.73		0.81	0.69			1.00	1.00		1.00	
Incremental Delay, d2	238.0	139.0		12.7	1.2			59.1	0.4		0.6	
Delay (s)	284.4	162.4		48.7	18.8			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		163.9			22.2			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	87.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3077		1770	3387		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3077		1770	3387		3433	3516		1770	3354	
Volume (vph)	192	787	483	72	680	109	635	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	855	525	78	739	118	690	1205	27	170	1276	228
RTOR Reduction (vph)	0	92	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1288	0	78	844	0	690	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	994		83	806		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.42		0.04	0.25		c0.20	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.30		0.94	1.05		1.26	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.35	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	133.8		77.0	44.8		129.9	25.6		18.3	200.1	
Delay (s)	62.1	143.1		124.5	82.9		171.9	58.1		61.1	234.6	
Level of Service	E	F		F	F		F	E		E	F	
Approach Delay (s)		132.4			86.3			98.9			217.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	138.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.33			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	115.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

APPENDIX C:
QUEUING CALCULATIONS

SYNCHRO QUEUE SHEETS
NO PROJECT ALTERNATIVE
EXISTING

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1171	111	692	91	229	64	192	202
v/c Ratio	0.97	0.66	0.65	0.67	0.50	0.61	0.25	0.72	0.51
Control Delay	68.2	22.2	48.1	54.9	50.0	44.7	42.4	52.6	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	22.2	48.1	54.9	50.0	44.7	42.4	52.6	9.3
Queue Length 50th (ft)	375	302	77	270	62	74	41	131	0
Queue Length 95th (ft)	#596	429	140	#352	111	111	79	203	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1771	193	1040	257	519	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.66	0.58	0.67	0.35	0.44	0.21	0.60	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	720	141	564	123	774
v/c Ratio	0.47	0.78	0.80	0.67	0.37	0.48	0.48
Control Delay	19.0	20.6	34.7	54.1	22.9	50.1	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	20.6	34.7	54.1	22.9	50.1	23.3
Queue Length 50th (ft)	19	175	239	96	135	81	190
Queue Length 95th (ft)	m25	107	280	160	204	141	291
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	227	1522	1251	257	1520	257	1596
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.57	0.58	0.55	0.37	0.48	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	234	82	39	309	25	451
v/c Ratio	0.54	0.28	0.20	0.28	0.14	0.44
Control Delay	13.2	19.3	18.7	8.0	21.0	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	19.3	18.7	8.0	21.0	9.9
Queue Length 50th (ft)	23	20	11	28	7	49
Queue Length 95th (ft)	75	50	31	131	24	169
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	435	291	283	1109	283	1024
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.28	0.14	0.28	0.09	0.44

Intersection Summary

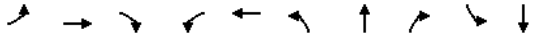
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	275	291	111	272
v/c Ratio	0.17	0.18	0.14	0.18
Control Delay	3.9	3.1	1.5	16.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	3.9	3.1	1.5	16.3
Queue Length 50th (ft)	8	3	0	52
Queue Length 95th (ft)	21	2	m0	78
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1575	1628	788	1509
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.14	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

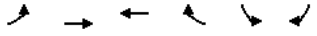
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	64	16	242	162	61	85
v/c Ratio	0.42	0.04	0.53	0.10	0.05	0.40
Control Delay	42.6	29.5	49.6	0.3	8.4	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	29.5	49.6	0.3	8.4	10.8
Queue Length 50th (ft)	44	0	77	2	12	0
Queue Length 95th (ft)	89	20	47	3	38	44
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	748	1236	1604	1264	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.02	0.20	0.10	0.05	0.21

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	318	336	96	37	610	65	314
v/c Ratio	0.03	0.12	0.10	0.61	0.64	0.41	0.03	0.39	0.30	0.57
Control Delay	34.8	34.9	18.1	22.9	23.1	31.0	18.2	0.7	31.7	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	34.9	18.1	22.9	23.1	31.0	18.2	0.7	31.7	20.8
Queue Length 50th (ft)	2	8	0	106	113	33	5	0	23	97
Queue Length 95th (ft)	14	36	20	254	269	95	17	0	71	219
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	452	476	417	740	751	440	1529	1583	554	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.43	0.45	0.22	0.02	0.39	0.12	0.37

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	734	668	139
v/c Ratio	0.38	0.19	0.48	0.51	0.82	0.29
Control Delay	39.3	3.6	19.0	2.8	36.9	5.4
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	39.3	3.6	19.3	2.8	36.9	5.4
Queue Length 50th (ft)	72	23	119	8	210	0
Queue Length 95th (ft)	129	52	m186	m141	245	42
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2316	1539	1441	1373	717
Starvation Cap Reductn	0	0	292	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.59	0.51	0.49	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	824	833	312	519	627	616
v/c Ratio	0.24	0.34	0.56	0.43	0.84	0.96	0.84
Control Delay	18.3	9.7	13.3	2.3	40.3	46.3	32.3
Queue Delay	0.0	1.0	0.1	0.0	0.0	0.5	0.1
Total Delay	18.3	10.7	13.3	2.3	40.3	46.8	32.4
Queue Length 50th (ft)	14	146	75	0	307	325	301
Queue Length 95th (ft)	39	138	101	16	#492	#587	#529
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	339	2403	1484	719	639	667	732
Starvation Cap Reductn	0	1234	0	0	0	0	0
Spillback Cap Reductn	0	91	53	0	0	3	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.70	0.58	0.43	0.81	0.94	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	396	1201	347	49	647	70	24	25	46	112	466
v/c Ratio	0.58	0.86	0.38	0.38	0.68	0.16	0.20	0.21	0.30	0.21	0.31
Control Delay	45.4	22.0	1.5	39.0	25.9	13.4	44.6	44.7	15.4	35.5	6.3
Queue Delay	0.0	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	23.9	1.7	39.0	25.9	13.4	44.6	44.7	15.4	35.5	6.3
Queue Length 50th (ft)	129	268	10	29	108	12	15	15	0	66	0
Queue Length 95th (ft)	m160	m#527	m14	m50	140	m30	42	43	34	113	17
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	684	1401	913	142	956	443	185	186	215	544	1513
Starvation Cap Reductn	0	94	124	0	0	0	0	0	0	0	91
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.92	0.44	0.35	0.68	0.16	0.13	0.13	0.21	0.21	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	373	83
v/c Ratio	0.03	0.03	0.14	0.08	0.22	0.24	0.13
Control Delay	19.4	19.0	2.4	45.0	19.4	17.9	30.2
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	17.9	30.2
Queue Length 50th (ft)	8	9	0	4	0	75	34
Queue Length 95th (ft)	26	22	21	19	24	107	89
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1553	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.24	0.13

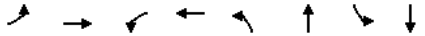
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	591	37	481	224	216	28	153	101
v/c Ratio	0.70	0.34	0.28	0.59	0.75	0.69	0.12	0.63	0.34
Control Delay	25.6	10.3	46.6	36.7	43.1	40.3	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	10.3	46.6	36.7	43.1	40.3	31.3	38.9	9.9
Queue Length 50th (ft)	223	111	22	140	140	130	16	95	0
Queue Length 95th (ft)	m#426	m217	54	193	214	199	29	100	39
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	550	1748	159	810	409	428	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.34	0.23	0.59	0.55	0.50	0.08	0.39	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

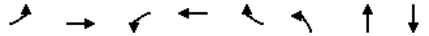
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	279	97	416	112	548	53	702
v/c Ratio	0.63	0.51	0.59	0.71	0.61	0.28	0.41	0.38
Control Delay	65.8	27.0	50.0	39.5	45.6	13.2	45.9	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	27.0	50.0	39.5	45.6	13.2	45.9	16.7
Queue Length 50th (ft)	47	57	60	131	69	94	33	138
Queue Length 95th (ft)	#108	96	111	173	120	151	70	220
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	909	212	1056	301	1987	230	1828
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.31	0.46	0.39	0.37	0.28	0.23	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

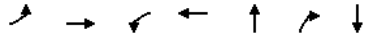


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	211	47	320	66	42	91	38
v/c Ratio	0.25	0.11	0.38	0.15	0.07	0.24	0.46	0.16
Control Delay	48.0	11.6	50.1	11.3	4.6	42.1	31.3	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	11.6	50.1	11.3	4.6	42.1	31.3	28.6
Queue Length 50th (ft)	16	26	29	32	0	25	38	17
Queue Length 95th (ft)	42	69	64	104	26	58	87	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	2004	140	2145	986	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.11	0.34	0.15	0.07	0.09	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	204	55	404	161	126	239	42	51	141
v/c Ratio	0.28	0.12	0.42	0.22	0.18	0.64	0.57	0.13	0.42	0.42
Control Delay	46.9	15.7	48.9	17.0	4.4	47.9	34.4	9.0	54.1	32.1
Queue Delay	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.7	48.9	17.4	4.8	47.9	34.4	9.0	54.1	32.1
Queue Length 50th (ft)	19	27	34	65	0	78	149	0	33	85
Queue Length 95th (ft)	47	70	71	142	43	133	180	25	73	93
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1702	164	1844	902	266	671	489	142	536
Starvation Cap Reductn	0	0	0	971	412	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.12	0.34	0.46	0.33	0.47	0.36	0.09	0.36	0.26

Intersection Summary

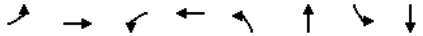


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	286	75	558	164	120	37
v/c Ratio	0.04	0.16	0.53	0.27	0.87	0.28	0.26
Control Delay	47.3	17.7	50.0	8.1	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.7	50.0	8.3	52.9	6.6	37.5
Queue Length 50th (ft)	2	51	43	21	99	0	21
Queue Length 95th (ft)	11	110	m91	180	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1800	195	2096	237	515	323
Starvation Cap Reductn	0	0	0	719	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.16	0.38	0.41	0.69	0.23	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	291	32	469	248	785	147	795
v/c Ratio	0.62	0.50	0.18	0.81	0.52	0.44	0.73	0.48
Control Delay	59.4	41.3	47.6	43.8	44.1	20.1	47.6	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	41.3	47.6	43.8	44.1	20.1	47.6	20.9
Queue Length 50th (ft)	43	42	18	108	76	177	92	188
Queue Length 95th (ft)	122	133	m50	187	116	288	149	277
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1021	188	762	481	1765	301	1663
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.29	0.17	0.62	0.52	0.44	0.49	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	327	7	472	145	318
v/c Ratio	0.27	0.15	0.05	0.23	0.27	0.60
Control Delay	11.8	5.9	21.2	6.2	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	5.9	21.2	6.2	16.5	19.4
Queue Length 50th (ft)	19	41	2	20	16	36
Queue Length 95th (ft)	m23	85	11	66	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2247	212	2075	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.23	0.24	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1009	846
v/c Ratio	0.57	0.58	0.44	0.37
Control Delay	46.2	43.7	9.7	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.7	8.9
Queue Length 50th (ft)	58	76	151	117
Queue Length 95th (ft)	92	112	234	184
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.44	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	473	742
v/c Ratio	0.36	0.96	0.24	0.24
Control Delay	26.2	29.3	10.5	10.2
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	26.2	29.3	11.1	10.2
Queue Length 50th (ft)	94	232	76	83
Queue Length 95th (ft)	130	#477	108	109
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1298	819	2000	3086
Starvation Cap Reductn	0	0	1119	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.88	0.54	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	512	240	526
v/c Ratio	0.51	0.26	0.48	0.20
Control Delay	22.3	8.8	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	8.8	28.9	3.2
Queue Length 50th (ft)	41	52	50	24
Queue Length 95th (ft)	71	94	78	44
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1951	638	2689
Starvation Cap Reductn	0	0	0	1605
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.26	0.38	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	808	114	867	182	560	141	273	501
v/c Ratio	0.87	0.59	0.61	0.78	0.58	0.89	0.45	0.82	0.83
Control Delay	61.6	28.6	69.0	28.6	47.6	54.9	43.3	55.5	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	28.6	69.0	28.6	47.6	54.9	43.3	55.5	20.5
Queue Length 50th (ft)	194	235	77	281	126	201	88	184	70
Queue Length 95th (ft)	#330	315	m122	#433	m184	m#288	149	#293	#243
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1380	225	1108	322	646	354	373	629
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.59	0.51	0.78	0.57	0.87	0.40	0.73	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	832	187	1040	197	961
v/c Ratio	0.79	0.74	0.81	0.76	0.67	0.82	0.63
Control Delay	44.8	33.7	34.2	58.7	29.1	72.7	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	33.7	34.2	58.7	29.1	72.7	28.4
Queue Length 50th (ft)	78	307	281	126	287	137	265
Queue Length 95th (ft)	m118	m333	284	#217	#503	#258	#463
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	184	1518	1413	274	1546	241	1530
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.53	0.59	0.68	0.67	0.82	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	362	146	177	699	21	467
v/c Ratio	0.81	0.31	0.78	0.71	0.12	0.70
Control Delay	33.7	15.7	44.4	18.1	22.6	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	15.7	44.4	18.1	22.6	20.0
Queue Length 50th (ft)	101	33	58	191	8	106
Queue Length 95th (ft)	#229	71	m#127	#444	m16	163
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	451	471	228	979	225	670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.31	0.78	0.71	0.09	0.70

Intersection Summary

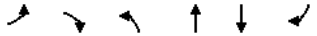
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	703	392	127	466
v/c Ratio	0.44	0.24	0.17	0.32
Control Delay	11.8	3.0	0.4	19.9
Queue Delay	1.1	0.3	0.0	0.0
Total Delay	12.9	3.4	0.4	19.9
Queue Length 50th (ft)	229	10	0	107
Queue Length 95th (ft)	67	12	m0	145
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1608	1609	746	1475
Starvation Cap Reductn	631	694	0	0
Spillback Cap Reductn	102	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.43	0.17	0.32

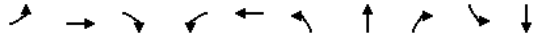
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	109	37	513	646	202	190
v/c Ratio	0.62	0.06	0.62	0.42	0.20	0.66
Control Delay	28.1	0.5	39.3	1.5	16.6	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	0.5	39.3	1.5	16.6	15.4
Queue Length 50th (ft)	41	1	124	14	66	33
Queue Length 95th (ft)	50	2	69	18	155	96
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	767	1155	1542	1023	522
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.05	0.44	0.42	0.20	0.36

Intersection Summary

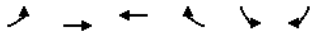


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	218	229	12	695	1150	274	612
v/c Ratio	0.56	1.14	0.21	0.69	0.72	0.12	0.82	0.73	0.83	0.73
Control Delay	42.3	126.8	27.1	36.6	37.1	45.9	37.7	2.9	43.0	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	126.8	27.1	36.6	37.1	45.9	37.7	2.9	43.0	26.7
Queue Length 50th (ft)	97	~281	21	121	127	7	189	0	145	241
Queue Length 95th (ft)	#201	#524	64	204	213	26	#320	0	#280	#568
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	336	353	317	457	459	259	934	1583	414	840
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.14	0.21	0.48	0.50	0.05	0.74	0.73	0.66	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1101	1062	745	359
v/c Ratio	0.47	0.45	0.74	0.76	0.83	0.53
Control Delay	45.8	4.4	13.3	13.3	40.8	5.2
Queue Delay	0.0	0.0	102.1	0.0	0.1	0.0
Total Delay	45.8	4.4	115.4	13.3	40.9	5.2
Queue Length 50th (ft)	97	59	321	508	255	0
Queue Length 95th (ft)	163	117	m354	m604	297	64
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2344	1485	1399	1124	760
Starvation Cap Reductn	0	0	584	0	0	0
Spillback Cap Reductn	0	6	0	0	34	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.45	1.22	0.76	0.68	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1020	1565	496	598	709	463
v/c Ratio	0.45	0.69	0.93	0.66	1.06	1.23	1.30
Control Delay	65.7	12.5	39.1	10.1	90.5	148.0	179.4
Queue Delay	0.0	1.4	69.3	0.4	7.8	1.9	1.6
Total Delay	65.7	13.8	108.4	10.5	98.4	149.8	181.0
Queue Length 50th (ft)	110	63	312	62	~488	~634	~691
Queue Length 95th (ft)	m172	100	m329	m72	#716	#889	#1037
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	753	565	576	356
Starvation Cap Reductn	0	265	118	47	0	0	0
Spillback Cap Reductn	0	79	333	0	11	2	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.83	1.16	0.70	1.08	1.24	1.30

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	385	925	636	282	1075	158	78	82	72	354	717
v/c Ratio	0.73	0.92	0.90	1.03	1.01	0.32	0.36	0.38	0.27	0.71	0.59
Control Delay	58.5	40.7	22.3	108.6	69.5	26.2	50.2	50.5	24.8	33.1	4.4
Queue Delay	0.0	3.3	0.8	0.0	31.9	0.0	0.0	0.0	0.0	7.1	0.1
Total Delay	58.5	44.0	23.1	108.6	101.3	26.2	50.2	50.5	24.8	40.2	4.5
Queue Length 50th (ft)	143	268	271	~214	~408	69	63	66	20	186	20
Queue Length 95th (ft)	m155	m298	m331	#382	#554	127	116	121	68	326	31
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	495	214	217	264	496	1208
Starvation Cap Reductn	0	39	9	0	0	0	0	0	0	101	47
Spillback Cap Reductn	0	0	0	0	84	0	0	0	0	0	3
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.96	0.91	1.03	1.10	0.32	0.36	0.38	0.27	0.90	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1000	239
v/c Ratio	0.13	0.12	0.45	0.42	0.51	0.62	0.36
Control Delay	30.4	29.3	6.0	50.5	12.6	24.9	38.4
Queue Delay	1.3	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	31.8	29.3	6.6	50.5	12.6	24.9	38.4
Queue Length 50th (ft)	52	51	3	35	0	274	174
Queue Length 95th (ft)	102	82	132	73	52	344	249
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1734	241	307	1603	668
Starvation Cap Reductn	377	0	577	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.67	0.21	0.34	0.62	0.36

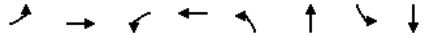
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	849	22	661	507	484	63	215	170
v/c Ratio	1.02	0.79	0.24	0.90	0.71	0.65	0.25	0.82	0.47
Control Delay	123.4	41.7	55.7	59.1	34.5	31.9	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	5.1	3.4	0.0	0.0	0.0
Total Delay	123.4	41.7	55.7	59.1	39.6	35.3	43.8	49.2	12.1
Queue Length 50th (ft)	~153	271	15	238	268	248	39	134	3
Queue Length 95th (ft)	#295	#449	42	#345	#499	456	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	180	1078	97	731	713	744	499	525	556
Starvation Cap Reductn	0	0	0	0	145	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.79	0.23	0.90	0.89	0.84	0.13	0.41	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

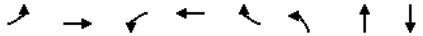


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	810	109	455	152	1189	122	1053
v/c Ratio	0.76	0.84	0.64	0.53	0.71	0.90	0.69	0.85
Control Delay	59.5	37.2	49.9	29.1	47.6	39.7	53.4	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	37.2	49.9	29.1	47.6	39.7	53.4	37.0
Queue Length 50th (ft)	78	213	60	107	83	~386	67	307
Queue Length 95th (ft)	#165	#292	113	153	145	#520	#137	#467
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	983	197	977	256	1316	197	1243
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.82	0.55	0.47	0.59	0.90	0.62	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	820	87	638	29	188	232	182
v/c Ratio	0.25	0.52	0.57	0.35	0.04	0.66	0.74	0.65
Control Delay	48.1	24.0	57.5	19.1	9.7	40.5	33.2	39.3
Queue Delay	0.0	1.1	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	48.1	25.2	57.5	19.7	9.7	40.5	33.2	39.3
Queue Length 50th (ft)	16	180	53	97	0	116	114	109
Queue Length 95th (ft)	42	#406	#120	267	23	163	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1583	158	1846	805	478	492	492
Starvation Cap Reductn	0	496	0	790	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.75	0.55	0.60	0.04	0.39	0.47	0.37

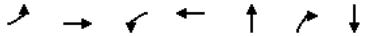
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	715	153	541	155	195	295	125	160	381
v/c Ratio	0.39	0.56	0.74	0.35	0.21	0.92	0.66	0.27	0.81	0.90
Control Delay	46.8	27.6	56.0	21.9	4.7	89.2	37.8	6.2	63.8	42.4
Queue Delay	0.0	1.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.7	56.0	22.7	4.7	89.2	37.8	6.2	63.8	42.4
Queue Length 50th (ft)	31	186	94	123	0	125	171	0	102	234
Queue Length 95th (ft)	67	268	#177	192	43	#259	244	42	#201	286
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1288	235	1537	736	212	540	530	212	531
Starvation Cap Reductn	0	330	0	651	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.65	0.61	0.21	0.92	0.55	0.24	0.75	0.72

Intersection Summary

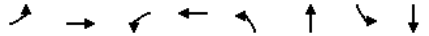
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	912	135	819	328	255	191
v/c Ratio	0.18	0.70	0.70	0.56	0.86	0.50	0.71
Control Delay	40.0	32.5	52.4	18.0	47.6	8.6	45.0
Queue Delay	0.0	8.5	0.0	0.3	0.0	0.0	0.0
Total Delay	40.0	41.1	52.4	18.3	47.6	8.6	45.0
Queue Length 50th (ft)	19	253	90	104	201	12	115
Queue Length 95th (ft)	47	#461	m57	m#281	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1303	301	1453	452	562	348
Starvation Cap Reductn	0	356	0	191	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.96	0.45	0.65	0.73	0.45	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	867	50	573	434	1051	241	1163
v/c Ratio	0.91	0.89	0.49	0.91	0.97	0.78	0.95	0.84
Control Delay	56.1	34.9	60.0	46.2	80.9	32.3	89.6	34.6
Queue Delay	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.8
Total Delay	56.1	36.6	60.0	46.2	80.9	32.3	89.6	35.4
Queue Length 50th (ft)	142	73	33	176	143	311	155	353
Queue Length 95th (ft)	m#247	#337	m71	#235	#242	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	254	978	111	679	446	1352	253	1380
Starvation Cap Reductn	0	37	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.92	0.45	0.84	0.97	0.78	0.95	0.88

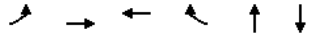
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	710	10	579	276	377
v/c Ratio	0.10	0.32	0.07	0.27	0.49	0.66
Control Delay	20.8	6.3	21.2	5.1	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	6.3	21.2	5.1	19.1	17.1
Queue Length 50th (ft)	7	91	3	26	35	36
Queue Length 95th (ft)	m7	m112	14	78	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2219	248	2175	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.32	0.04	0.27	0.43	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1270	1413
v/c Ratio	0.69	0.63	0.59	0.65
Control Delay	46.8	43.3	14.2	15.5
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.6	15.5
Queue Length 50th (ft)	90	88	248	295
Queue Length 95th (ft)	131	127	369	437
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2169	2165
Starvation Cap Reductn	0	0	396	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.72	0.65

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	898	1317
v/c Ratio	0.31	1.01	0.46	0.42
Control Delay	25.4	64.2	10.4	9.7
Queue Delay	0.1	0.0	4.7	0.1
Total Delay	25.5	64.2	15.2	9.8
Queue Length 50th (ft)	75	~269	132	130
Queue Length 95th (ft)	111	#494	175	160
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	591	1946	3100
Starvation Cap Reductn	0	0	960	0
Spillback Cap Reductn	148	0	0	561
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.01	0.91	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	926	643	760
v/c Ratio	0.82	0.59	0.82	0.30
Control Delay	44.3	26.1	43.5	6.6
Queue Delay	0.2	0.7	12.7	1.8
Total Delay	44.6	26.8	56.2	8.4
Queue Length 50th (ft)	216	252	223	93
Queue Length 95th (ft)	272	373	270	135
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1536
Spillback Cap Reductn	32	309	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.74	0.97	0.78

Intersection Summary

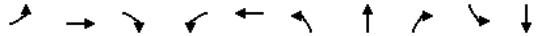
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	897	328	284	381
v/c Ratio	0.52	0.22	0.36	0.28
Control Delay	8.9	13.5	6.2	21.8
Queue Delay	2.6	0.0	1.9	0.0
Total Delay	11.4	13.5	8.1	21.8
Queue Length 50th (ft)	234	90	121	91
Queue Length 95th (ft)	39	m95	m188	128
Internal Link Dist (ft)	342	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1730	1480	789	1347
Starvation Cap Reductn	680	0	351	0
Spillback Cap Reductn	146	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.22	0.65	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	239	55	717	849	233	197
v/c Ratio	0.75	0.07	0.70	0.61	0.31	0.19
Control Delay	18.4	0.2	14.1	10.9	25.4	6.2
Queue Delay	0.0	0.0	0.0	1.3	0.0	0.0
Total Delay	18.4	0.2	14.2	12.2	25.4	6.2
Queue Length 50th (ft)	53	1	95	567	111	36
Queue Length 95th (ft)	61	1	216	711	194	65
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	911	1186	1391	763	1171
Starvation Cap Reductn	0	0	0	323	0	0
Spillback Cap Reductn	0	0	13	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.06	0.61	0.79	0.31	0.17

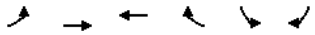
Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	381	370	45	265	845	130	458
v/c Ratio	0.18	0.14	0.05	0.69	0.67	0.26	0.28	0.53	0.52	0.70
Control Delay	35.5	35.5	20.7	26.4	25.7	34.8	21.9	1.3	31.7	24.6
Queue Delay	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1
Total Delay	35.5	35.5	20.7	26.6	26.0	34.8	21.9	1.3	31.7	24.7
Queue Length 50th (ft)	13	11	0	170	163	21	52	0	61	193
Queue Length 95th (ft)	39	34	13	#326	#310	54	92	0	115	#361
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	393	414	358	677	678	376	1279	1583	518	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	3	41	41	0	0	0	0	18
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.02	0.60	0.58	0.12	0.21	0.53	0.25	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	576	853	901	263
v/c Ratio	0.68	0.13	0.37	0.61	0.88	0.40
Control Delay	51.4	9.4	13.4	10.0	37.5	4.0
Queue Delay	0.0	0.0	1.1	0.0	2.5	0.0
Total Delay	51.4	9.4	14.5	10.0	40.0	4.0
Queue Length 50th (ft)	85	41	130	313	312	0
Queue Length 95th (ft)	141	74	212	527	344	52
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2223	1566	1399	1592	875
Starvation Cap Reductn	0	0	718	0	133	0
Spillback Cap Reductn	0	128	0	0	540	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.14	0.68	0.61	0.86	0.30

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1077	1024	446	404	555	533
v/c Ratio	0.74	0.90	0.61	0.55	0.55	0.69	1.35
Control Delay	65.7	32.3	31.2	8.6	26.5	16.4	196.7
Queue Delay	0.0	102.7	0.0	0.2	0.0	196.7	512.7
Total Delay	65.7	135.0	31.2	8.8	26.6	213.1	709.4
Queue Length 50th (ft)	65	294	242	79	217	159	~837
Queue Length 95th (ft)	127	#354	304	m127	320	307	#723
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1681	812	734	799	395
Starvation Cap Reductn	0	321	0	44	0	0	0
Spillback Cap Reductn	0	25	6	0	8	411	238
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.23	0.61	0.58	0.56	1.43	3.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	413	1109	620	293	480	137	153	161	110	428	729
v/c Ratio	0.70	0.95	1.01	1.07	0.45	0.27	0.84	0.86	0.42	0.86	0.54
Control Delay	52.1	27.6	35.1	119.0	32.9	14.4	91.5	93.8	26.5	39.9	15.6
Queue Delay	252.2	121.8	26.8	0.0	0.0	0.0	0.0	0.0	0.0	19.8	0.3
Total Delay	304.3	149.4	61.9	119.0	32.9	14.4	91.5	93.8	26.5	59.6	15.9
Queue Length 50th (ft)	135	191	~154	~230	144	29	121	127	25	245	74
Queue Length 95th (ft)	m148	m267	m#416	#401	193	77	m#235	m#249	m69	#454	95
Internal Link Dist (ft)		92			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1169	616	274	1062	514	183	188	261	500	1344
Starvation Cap Reductn	327	302	45	0	0	0	0	0	0	75	189
Spillback Cap Reductn	0	0	0	0	0	2	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.55	1.28	1.09	1.07	0.45	0.27	0.84	0.86	0.42	1.01	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

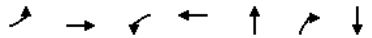
Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1345	290
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.82	0.44
Control Delay	31.2	30.3	33.0	50.5	12.1	22.0	33.9
Queue Delay	1.2	0.7	1.9	0.0	0.3	0.0	0.0
Total Delay	32.4	31.0	35.0	50.5	12.5	22.0	33.9
Queue Length 50th (ft)	64	66	250	38	0	480	190
Queue Length 95th (ft)	135	117	381	78	57	565	302
Internal Link Dist (ft)		150				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1637	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	4	0	0	0	32	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.44	0.82	0.44

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	645	40	651	183	187	38	190	97
v/c Ratio	0.60	0.40	0.35	0.46	0.56	0.55	0.12	0.56	0.27
Control Delay	52.6	16.1	38.4	20.4	24.2	22.9	20.7	24.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	16.1	38.4	20.4	24.2	22.9	20.7	24.0	6.8
Queue Length 50th (ft)	25	72	14	104	58	56	11	61	0
Queue Length 95th (ft)	#93	#175	44	#206	120	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	121	1607	114	1449	440	460	440	463	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.40	0.35	0.45	0.42	0.41	0.09	0.41	0.21

Intersection Summary

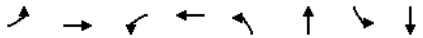
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	994	165	1012	204	197	59
v/c Ratio	0.32	0.60	1.04	0.50	0.72	0.48	0.24
Control Delay	62.2	13.4	107.5	13.2	42.4	7.0	27.7
Queue Delay	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	62.2	13.4	107.5	14.1	42.4	7.0	27.7
Queue Length 50th (ft)	13	32	~117	66	126	0	27
Queue Length 95th (ft)	m21	#502	m#180	m#410	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1659	159	2032	441	530	445
Starvation Cap Reductn	0	0	0	684	0	0	0
Spillback Cap Reductn	0	32	0	0	0	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.61	1.04	0.75	0.46	0.37	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	895	75	513	488	728	123	943
v/c Ratio	0.80	0.80	0.74	0.60	0.91	0.57	0.68	0.91
Control Delay	63.7	16.0	80.7	36.1	61.2	28.1	50.5	45.3
Queue Delay	0.0	0.9	0.0	0.5	3.2	0.0	0.0	0.1
Total Delay	63.7	16.8	80.7	36.7	64.4	28.1	50.5	45.4
Queue Length 50th (ft)	82	251	48	151	158	192	77	292
Queue Length 95th (ft)	#218	#60	#121	207	#247	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1117	106	851	549	1273	239	1041
Starvation Cap Reductn	0	63	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	23	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.85	0.71	0.68	0.93	0.57	0.51	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

SYNCHRO QUEUE SHEETS
NO PROJECT ALTERNATIVE
2010

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1231	109	813	120	297	64	218	208
v/c Ratio	0.97	0.73	0.64	0.85	0.57	0.69	0.24	0.78	0.50
Control Delay	67.5	25.5	51.9	57.5	51.5	46.2	41.9	55.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	25.5	51.9	57.5	51.5	46.2	41.9	55.7	9.2
Queue Length 50th (ft)	374	353	78	321	81	96	40	148	0
Queue Length 95th (ft)	#593	475	m122	#465	139	140	79	229	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1694	193	957	257	522	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.73	0.56	0.85	0.47	0.57	0.21	0.68	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

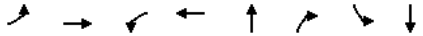
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	753	204	741	124	934
v/c Ratio	0.75	0.73	0.77	0.83	0.53	0.48	0.66
Control Delay	23.1	16.6	32.1	68.5	28.5	50.2	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	16.6	32.1	68.5	28.5	50.2	31.0
Queue Length 50th (ft)	25	82	233	141	209	82	281
Queue Length 95th (ft)	m31	88	268	#258	304	142	#415
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	214	1522	1221	257	1393	257	1408
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.58	0.62	0.79	0.53	0.48	0.66

Intersection Summary

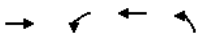
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	69	59	167	166	44	125	236
v/c Ratio	0.18	0.32	0.11	0.29	0.27	0.08	0.51	0.26
Control Delay	34.0	32.9	1.1	0.4	30.0	10.5	32.6	15.2
Queue Delay	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Delay	34.0	32.9	1.2	0.6	30.0	10.5	32.6	15.2
Queue Length 50th (ft)	13	24	1	0	60	0	46	56
Queue Length 95th (ft)	52	82	1	0	159	29	130	146
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	582	607	908	906	878	791	582	1072
Starvation Cap Reductn	0	0	330	244	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.11	0.10	0.25	0.19	0.06	0.21	0.22

Intersection Summary



Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	234	26	165	73
v/c Ratio	0.15	0.43	0.54	0.37
Control Delay	0.4	36.4	30.7	32.2
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	0.6	36.4	30.7	32.2
Queue Length 50th (ft)	3	9	60	25
Queue Length 95th (ft)	3	43	158	84
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1687	123	612	580
Starvation Cap Reductn	891	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.21	0.27	0.13

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	266	107	38	323	24	532
v/c Ratio	0.67	0.36	0.19	0.29	0.14	0.52
Control Delay	22.3	21.0	18.4	7.8	20.9	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	21.0	18.4	7.8	20.9	11.0
Queue Length 50th (ft)	44	27	10	30	7	60
Queue Length 95th (ft)	#132	62	27	137	23	208
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	396	296	283	1109	283	1021
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.36	0.13	0.29	0.08	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	175	165	62	258	103	326
v/c Ratio	0.65	0.59	0.73	0.68	0.09	0.11	0.09	0.15
Control Delay	72.9	20.3	79.0	74.2	0.4	0.3	0.2	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	79.0	74.2	0.4	0.3	0.2	6.1
Queue Length 50th (ft)	45	0	123	109	1	1	0	36
Queue Length 95th (ft)	#112	56	#203	175	m1	1	0	53
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	273	702	2403	1108	2237
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.65	0.60	0.09	0.11	0.09	0.15

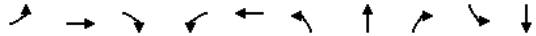
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	58	45	266	223	73	124
v/c Ratio	0.42	0.10	0.55	0.14	0.06	0.53
Control Delay	37.1	19.1	43.2	0.4	7.9	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	19.1	43.2	0.4	7.9	10.0
Queue Length 50th (ft)	34	7	78	2	14	0
Queue Length 95th (ft)	m63	m26	75	4	41	53
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	779	1236	1570	1234	430
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.06	0.22	0.14	0.06	0.29

Intersection Summary

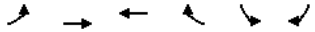
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	372	393	93	88	799	80	322
v/c Ratio	0.03	0.13	0.10	0.62	0.65	0.42	0.09	0.50	0.38	0.62
Control Delay	35.6	35.8	18.2	24.2	24.7	32.4	19.2	1.2	32.3	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	35.8	18.2	24.2	24.7	32.4	19.2	1.2	32.3	22.3
Queue Length 50th (ft)	2	9	0	135	146	37	14	0	32	117
Queue Length 95th (ft)	14	35	20	#332	#358	93	34	0	83	224
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	424	446	392	736	745	412	1412	1583	525	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.51	0.53	0.23	0.06	0.50	0.15	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	727	971	795	136
v/c Ratio	0.37	0.19	0.51	0.67	0.85	0.26
Control Delay	39.1	4.4	18.0	8.9	35.8	5.0
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	39.1	4.4	18.6	8.9	35.8	5.0
Queue Length 50th (ft)	70	25	103	328	248	0
Queue Length 95th (ft)	126	55	m171	m576	287	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2204	1418	1441	1373	715
Starvation Cap Reductn	0	0	319	0	0	0
Spillback Cap Reductn	0	1	0	0	21	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.19	0.66	0.67	0.59	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	944	1055	362	547	647	635
v/c Ratio	0.24	0.39	0.71	0.48	0.86	1.00	0.88
Control Delay	23.1	9.3	15.9	2.4	43.5	61.6	38.3
Queue Delay	0.0	1.7	0.1	0.1	0.0	4.2	2.4
Total Delay	23.1	10.9	16.0	2.5	43.5	65.8	40.6
Queue Length 50th (ft)	15	152	112	0	331	~378	341
Queue Length 95th (ft)	m42	138	147	m14	#534	#649	#585
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	753	639	646	718
Starvation Cap Reductn	0	1214	0	40	0	0	0
Spillback Cap Reductn	0	122	39	0	0	10	29
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.80	0.73	0.51	0.86	1.02	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	364	1375	389	79	782	69	23	24	44	199	597
v/c Ratio	0.54	0.99	0.41	0.61	0.82	0.16	0.19	0.19	0.28	0.37	0.40
Control Delay	44.5	37.6	1.6	60.1	42.5	22.6	44.0	44.0	15.4	34.1	3.6
Queue Delay	0.0	11.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Total Delay	44.5	49.3	1.8	60.1	42.5	22.6	44.0	44.0	15.4	35.0	3.6
Queue Length 50th (ft)	112	~318	8	49	245	25	14	15	0	93	0
Queue Length 95th (ft)	m144	m#652	m14	#106	318	59	40	41	32	156	63
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	676	1393	930	142	956	441	185	186	213	538	1500
Starvation Cap Reductn	0	59	110	0	0	0	0	0	0	156	29
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	1.03	0.47	0.56	0.82	0.16	0.12	0.13	0.21	0.52	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

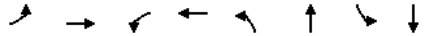
Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	504	123
v/c Ratio	0.07	0.07	0.23	0.22	0.12
Control Delay	26.0	25.7	2.6	7.6	10.2
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.0	25.7	3.3	7.6	10.2
Queue Length 50th (ft)	14	14	1	62	35
Queue Length 95th (ft)	38	31	23	85	49
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1189	2278	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.22	0.12

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	723	38	560	245	248	29	212	108
v/c Ratio	0.84	0.44	0.29	0.69	0.79	0.76	0.11	0.74	0.32
Control Delay	53.4	18.5	46.7	39.6	44.2	42.2	28.1	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	18.5	46.7	39.6	44.2	42.2	28.1	38.9	10.3
Queue Length 50th (ft)	249	144	23	168	154	150	13	131	1
Queue Length 95th (ft)	#538	238	55	228	233	231	30	152	40
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	494	1638	159	810	407	426	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.44	0.24	0.69	0.60	0.58	0.08	0.54	0.26

Intersection Summary

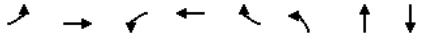
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	394	105	458	134	634	52	872
v/c Ratio	0.80	0.59	0.62	0.69	0.65	0.34	0.41	0.53
Control Delay	87.5	32.3	51.1	38.3	46.2	15.6	45.9	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	32.3	51.1	38.3	46.2	15.6	45.9	21.7
Queue Length 50th (ft)	63	102	65	144	83	117	32	195
Queue Length 95th (ft)	#154	145	118	183	137	191	69	314
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	899	212	1057	301	1847	230	1640
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.44	0.50	0.43	0.45	0.34	0.23	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



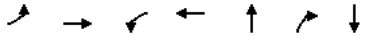
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	352	45	364	186	62	197	88
v/c Ratio	0.24	0.19	0.37	0.18	0.19	0.25	0.74	0.37
Control Delay	47.9	15.0	49.9	14.5	4.0	37.1	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	15.0	49.9	14.5	4.0	37.1	40.7	36.0
Queue Length 50th (ft)	16	53	28	43	0	36	116	50
Queue Length 95th (ft)	42	127	62	136	49	70	180	81
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1846	138	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.19	0.33	0.18	0.19	0.13	0.40	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	334	55	555	176	137	266	41	114	203
v/c Ratio	0.27	0.20	0.42	0.31	0.20	0.67	0.63	0.10	0.81	0.57
Control Delay	46.8	17.5	48.9	18.3	4.3	48.9	34.9	7.4	84.1	31.2
Queue Delay	0.0	0.0	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.5	48.9	19.1	4.7	48.9	34.9	7.4	84.1	31.2
Queue Length 50th (ft)	18	52	34	98	0	85	165	0	77	99
Queue Length 95th (ft)	46	115	71	196	45	144	200	23	#175	120
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1650	164	1793	889	266	671	596	142	538
Starvation Cap Reductn	0	0	0	884	390	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.20	0.34	0.61	0.35	0.52	0.40	0.07	0.80	0.38

Intersection Summary

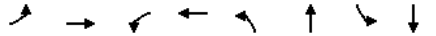
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	453	128	695	247	127	38
v/c Ratio	0.04	0.26	0.67	0.31	0.79	0.34	0.25
Control Delay	47.3	17.9	57.4	8.6	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.2	57.4	8.8	42.7	7.2	36.5
Queue Length 50th (ft)	2	83	82	18	153	0	21
Queue Length 95th (ft)	11	171	m123	m226	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1755	210	2227	487	520	329
Starvation Cap Reductn	0	677	0	733	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.42	0.61	0.47	0.51	0.24	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	432	34	645	303	834	168	974
v/c Ratio	0.63	0.57	0.20	0.90	0.63	0.53	0.77	0.64
Control Delay	60.8	31.4	47.0	48.0	47.1	24.2	49.1	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	60.8	31.4	47.0	48.0	47.1	24.2	49.1	26.6
Queue Length 50th (ft)	43	54	17	160	95	213	105	267
Queue Length 95th (ft)	121	182	m49	#260	140	318	168	368
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1034	181	786	481	1587	301	1519
Starvation Cap Reductn	0	0	0	0	0	0	0	73
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.42	0.19	0.82	0.63	0.53	0.56	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

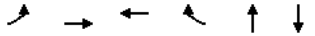
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	426	82	635	240	394
v/c Ratio	0.28	0.22	0.44	0.31	0.40	0.73
Control Delay	15.9	8.9	26.3	6.9	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	8.9	26.3	6.9	16.0	26.0
Queue Length 50th (ft)	19	78	23	30	25	51
Queue Length 95th (ft)	m28	114	55	92	51	#104
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2043	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.22	0.39	0.31	0.39	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.51	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	658	594	1096	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1122	1094
v/c Ratio	0.77	0.74	0.54	0.53
Control Delay	54.3	46.4	14.3	14.1
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.6	14.1
Queue Length 50th (ft)	94	136	227	218
Queue Length 95th (ft)	#144	185	299	288
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	389	631	2085	2079
Starvation Cap Reductn	0	0	373	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.66	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	538	1051
v/c Ratio	0.44	0.98	0.29	0.37
Control Delay	25.4	43.8	12.3	12.7
Queue Delay	0.0	0.0	1.4	0.0
Total Delay	25.4	43.8	13.7	12.7
Queue Length 50th (ft)	136	309	91	131
Queue Length 95th (ft)	184	#575	124	161
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	785	1833	2856
Starvation Cap Reductn	0	0	1051	0
Spillback Cap Reductn	14	0	0	55
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.96	0.69	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	576	457	616
v/c Ratio	0.68	0.36	0.75	0.25
Control Delay	25.3	13.4	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.5
Total Delay	25.3	13.4	34.4	5.1
Queue Length 50th (ft)	93	78	96	41
Queue Length 95th (ft)	130	127	#143	74
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1612	638	2462
Starvation Cap Reductn	0	0	0	1354
Spillback Cap Reductn	35	2	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.36	0.72	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1015	146	974	193	600	146	321	509
v/c Ratio	0.90	0.79	0.72	0.96	0.60	0.93	0.43	0.89	0.83
Control Delay	67.1	36.2	61.4	48.7	48.4	61.5	42.8	66.0	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.2	61.4	48.7	48.4	61.5	42.8	66.0	23.1
Queue Length 50th (ft)	210	335	98	~390	135	218	91	221	85
Queue Length 95th (ft)	#361	422	m114	m#441	m181	m#307	154	#375	#267
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1279	225	1019	322	646	354	373	621
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.79	0.65	0.96	0.60	0.93	0.41	0.86	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

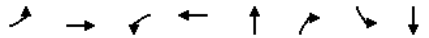
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	905	284	1206	196	1229
v/c Ratio	1.32	0.62	0.77	1.04	1.08	0.81	1.17
Control Delay	200.7	25.8	30.8	110.4	86.7	72.2	122.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	200.7	25.8	30.8	110.4	86.7	72.2	122.1
Queue Length 50th (ft)	~192	313	271	~217	~500	136	~541
Queue Length 95th (ft)	m#273	m375	355	#386	#637	#257	#678
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	158	1517	1176	274	1119	241	1050
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.62	0.77	1.04	1.08	0.81	1.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	99	89	144	351	457	220	94	261
v/c Ratio	0.56	0.48	0.21	0.50	0.89	0.37	0.61	0.36
Control Delay	50.2	48.2	1.1	1.2	59.5	8.5	60.4	24.0
Queue Delay	0.0	0.0	0.7	1.1	0.0	0.0	0.0	0.0
Total Delay	50.2	48.2	1.8	2.3	59.5	8.5	60.4	24.0
Queue Length 50th (ft)	67	58	2	0	307	10	64	116
Queue Length 95th (ft)	128	116	m2	m0	#580	76	#132	213
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	330	345	791	803	515	587	181	758
Starvation Cap Reductn	0	0	411	240	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.26	0.38	0.62	0.89	0.37	0.52	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	397	35	375	141
v/c Ratio	0.26	0.51	0.86	0.68
Control Delay	1.5	67.6	62.3	49.4
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	2.1	67.6	62.3	49.4
Queue Length 50th (ft)	23	21	254	92
Queue Length 95th (ft)	28	#79	#492	165
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1485	69	434	315
Starvation Cap Reductn	711	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.51	0.86	0.45

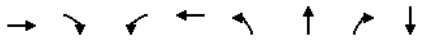
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	441	165	172	738	20	550
v/c Ratio	0.99	0.35	0.78	0.76	0.12	0.82
Control Delay	64.1	16.8	44.3	20.0	22.8	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	16.8	44.3	20.0	22.8	24.7
Queue Length 50th (ft)	137	39	56	205	8	125
Queue Length 95th (ft)	#302	81	m#128	#476	m14	m#189
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	445	466	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.35	0.76	0.76	0.09	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



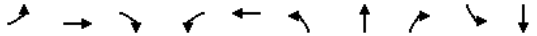
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	342	324	144	386	133	460
v/c Ratio	0.17	0.54	0.45	0.43	0.49	0.28	0.21	0.37
Control Delay	50.6	16.8	6.7	5.7	28.5	19.8	4.9	24.4
Queue Delay	0.0	0.3	1.3	1.1	0.0	0.4	0.0	0.0
Total Delay	50.6	17.1	8.0	6.8	28.5	20.2	4.9	24.4
Queue Length 50th (ft)	12	0	52	44	36	51	8	115
Queue Length 95th (ft)	35	52	83	73	m65	m78	m23	159
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	746	294	1358	639	1237
Starvation Cap Reductn	0	0	232	222	0	497	0	0
Spillback Cap Reductn	0	9	158	155	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.48	0.65	0.62	0.49	0.45	0.21	0.37

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	39	471	697	205	197
v/c Ratio	0.63	0.07	0.68	0.45	0.19	0.67
Control Delay	32.9	1.2	51.8	1.3	13.7	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	1.2	51.8	1.3	13.7	15.9
Queue Length 50th (ft)	47	0	161	4	58	35
Queue Length 95th (ft)	75	5	111	16	147	100
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	773	1155	1536	1093	524
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.05	0.41	0.45	0.19	0.38

Intersection Summary

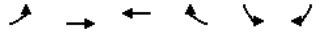


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	305	319	12	722	1275	283	632
v/c Ratio	0.58	1.19	0.21	0.81	0.84	0.13	0.88	0.81	0.85	0.78
Control Delay	46.0	149.1	28.4	42.7	44.1	47.5	43.9	4.5	48.5	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	149.1	28.4	42.7	44.1	47.5	43.9	4.5	48.5	30.8
Queue Length 50th (ft)	106	~312	23	185	194	7	228	0	167	300
Queue Length 95th (ft)	#193	#506	62	#296	#326	26	#341	0	#294	#600
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	310	326	295	446	449	243	877	1583	391	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.19	0.21	0.68	0.71	0.05	0.82	0.81	0.72	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1187	1117	953	347
v/c Ratio	0.46	0.46	0.86	0.80	0.90	0.50
Control Delay	45.4	5.1	16.1	14.9	44.6	7.9
Queue Delay	0.0	0.0	137.2	0.0	2.1	0.0
Total Delay	45.4	5.1	153.3	14.9	46.7	7.9
Queue Length 50th (ft)	94	71	365	614	321	25
Queue Length 95th (ft)	158	114	m353	m575	404	99
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2226	1382	1399	1124	717
Starvation Cap Reductn	0	0	472	0	0	0
Spillback Cap Reductn	0	12	0	0	76	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.46	1.30	0.80	0.91	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1225	1704	427	601	793	556
v/c Ratio	0.44	0.82	1.01	0.56	1.06	1.35	1.61
Control Delay	64.8	14.4	50.9	6.2	92.1	196.6	312.2
Queue Delay	0.0	8.6	100.0	0.3	29.6	30.2	71.4
Total Delay	64.8	23.0	150.9	6.5	121.8	226.8	383.7
Queue Length 50th (ft)	108	82	~328	35	~493	~750	~954
Queue Length 95th (ft)	m142	99	m311	m36	#723	#1013	#916
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	761	565	587	345
Starvation Cap Reductn	0	159	108	54	0	0	0
Spillback Cap Reductn	0	241	324	0	37	28	31
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.98	1.25	0.60	1.14	1.42	1.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	441	1124	771	342	1236	234	76	80	69	390	643
v/c Ratio	0.83	1.11	1.10	1.25	1.16	0.47	0.36	0.37	0.26	0.79	0.53
Control Delay	56.8	89.0	70.0	174.7	119.7	32.3	50.0	50.4	25.1	48.9	9.6
Queue Delay	0.0	21.2	5.2	0.0	94.4	0.0	0.0	0.0	0.0	15.4	0.1
Total Delay	56.8	110.2	75.2	174.7	214.0	32.3	50.0	50.4	25.1	64.3	9.7
Queue Length 50th (ft)	166	~490	~437	~295	~532	134	61	64	19	290	135
Queue Length 95th (ft)	m160	m#429	m#422	#494	#697	224	113	118	66	#403	98
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1011	700	274	1062	501	214	217	262	494	1209
Starvation Cap Reductn	0	43	8	0	0	0	0	0	0	94	60
Spillback Cap Reductn	0	0	0	0	164	0	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	1.16	1.11	1.25	1.38	0.47	0.36	0.37	0.26	0.97	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1170	243
v/c Ratio	0.17	0.17	0.45	0.57	0.40
Control Delay	33.3	32.2	7.4	15.4	42.9
Queue Delay	2.3	1.3	0.4	0.0	0.0
Total Delay	35.5	33.4	7.9	15.4	42.9
Queue Length 50th (ft)	62	65	67	252	167
Queue Length 95th (ft)	118	104	128	313	253
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1932	2069	610
Starvation Cap Reductn	352	752	549	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.63	0.57	0.40

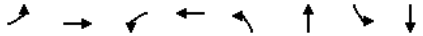
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1049	21	788	509	565	72	256	160
v/c Ratio	1.24	1.01	0.23	1.08	0.75	0.80	0.24	0.80	0.40
Control Delay	198.8	65.5	55.4	96.8	39.1	41.1	47.2	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	3.3	7.6	0.0	0.0	0.0
Total Delay	198.8	65.5	55.4	96.8	42.4	48.8	47.2	54.1	15.9
Queue Length 50th (ft)	~183	211	15	~325	282	328	51	187	13
Queue Length 95th (ft)	#330	#590	41	#451	#542	#613	100	273	86
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1037	97	733	677	707	499	525	549
Starvation Cap Reductn	0	0	0	0	92	108	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.01	0.22	1.08	0.87	0.94	0.14	0.49	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

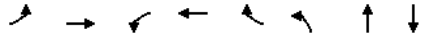


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	879	107	549	188	1408	118	1256
v/c Ratio	0.83	0.89	0.64	0.63	0.80	1.09	0.67	1.07
Control Delay	69.8	41.9	49.4	31.1	55.8	84.2	52.2	79.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	41.9	49.4	31.1	55.8	84.2	52.2	79.8
Queue Length 50th (ft)	90	241	59	136	104	~526	65	~466
Queue Length 95th (ft)	#194	#354	112	189	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	991	197	978	256	1290	197	1171
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.89	0.54	0.56	0.73	1.09	0.60	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	892	84	705	58	218	270	313
v/c Ratio	0.26	0.65	0.58	0.46	0.08	0.70	0.81	0.84
Control Delay	48.8	30.5	58.8	25.3	8.4	40.7	36.1	43.2
Queue Delay	0.0	2.1	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	32.6	58.8	25.8	8.4	40.7	36.1	43.2
Queue Length 50th (ft)	17	242	52	172	0	133	140	191
Queue Length 95th (ft)	44	#460	#127	#325	32	189	206	266
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1367	152	1544	694	478	491	494
Starvation Cap Reductn	0	322	0	401	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.85	0.55	0.62	0.08	0.46	0.55	0.63

Intersection Summary

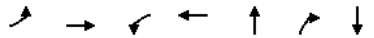
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	841	148	614	205	218	340	140	243	501
v/c Ratio	0.39	0.75	0.74	0.43	0.28	1.03	0.65	0.26	1.15	0.97
Control Delay	46.8	34.9	56.0	24.2	4.6	114.2	37.3	6.0	144.0	59.1
Queue Delay	0.0	5.7	0.0	1.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	40.6	56.0	25.3	4.9	114.2	37.3	6.0	144.0	59.1
Queue Length 50th (ft)	30	252	91	157	0	~149	188	0	~183	314
Queue Length 95th (ft)	64	328	#168	220	48	#296	284	44	#341	#481
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1128	230	1427	724	212	540	540	212	533
Starvation Cap Reductn	0	230	0	536	197	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.94	0.64	0.69	0.39	1.03	0.63	0.26	1.15	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

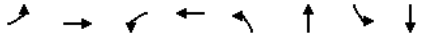


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1127	166	938	336	301	193
v/c Ratio	0.18	0.92	0.75	0.65	0.87	0.56	0.72
Control Delay	39.9	45.6	49.6	19.8	48.4	9.2	45.1
Queue Delay	0.0	82.0	0.0	0.6	0.0	1.5	3.3
Total Delay	39.9	127.6	49.6	20.4	48.4	10.7	48.5
Queue Length 50th (ft)	18	354	103	129	205	17	116
Queue Length 95th (ft)	46	#642	m59	m270	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1231	301	1444	452	589	349
Starvation Cap Reductn	0	279	0	189	0	0	0
Spillback Cap Reductn	0	151	0	0	0	143	84
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.18	0.55	0.75	0.74	0.67	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1075	49	692	500	1282	281	1343
v/c Ratio	0.92	1.07	0.51	1.02	1.12	0.98	1.08	1.00
Control Delay	50.0	71.1	59.8	74.4	120.9	52.7	123.1	55.0
Queue Delay	0.0	14.7	0.0	0.0	11.7	0.0	0.0	13.0
Total Delay	50.0	85.8	59.8	74.4	132.6	52.7	123.1	68.0
Queue Length 50th (ft)	111	~370	32	~235	~190	418	~210	~453
Queue Length 95th (ft)	m#136	m#439	m67	#328	#292	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1007	106	679	446	1307	259	1349
Starvation Cap Reductn	0	33	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	11	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.10	0.46	1.02	1.15	0.98	1.08	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	870	47	695	440	450
v/c Ratio	0.14	0.44	0.26	0.33	0.66	0.83
Control Delay	20.8	9.2	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	9.2	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	125	13	35	50	51
Queue Length 95th (ft)	m8	m142	36	100	88	#117
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	248	2116	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.19	0.33	0.64	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1594	1667
v/c Ratio	1.08	0.74	0.81	0.84
Control Delay	107.2	47.0	22.9	24.7
Queue Delay	0.0	0.0	2.4	0.0
Total Delay	107.2	47.0	25.3	24.7
Queue Length 50th (ft)	~197	129	433	472
Queue Length 95th (ft)	#306	180	552	601
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1973
Starvation Cap Reductn	0	0	253	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.93	0.84

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1087	1603
v/c Ratio	0.45	1.39	0.66	0.52
Control Delay	27.1	210.0	13.7	10.7
Queue Delay	0.3	0.0	29.3	0.3
Total Delay	27.4	210.0	43.0	11.0
Queue Length 50th (ft)	113	~544	192	172
Queue Length 95th (ft)	159	#768	259	208
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	556	1659	3103
Starvation Cap Reductn	0	0	622	0
Spillback Cap Reductn	158	0	0	793
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.39	1.05	0.69

Intersection Summary

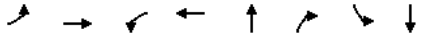
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1082	788	898
v/c Ratio	0.96	0.81	0.88	0.38
Control Delay	61.0	37.2	46.6	8.4
Queue Delay	27.3	43.0	145.2	4.7
Total Delay	88.2	80.2	191.8	13.2
Queue Length 50th (ft)	308	364	269	132
Queue Length 95th (ft)	#437	#464	341	166
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1328	967	2384
Starvation Cap Reductn	0	0	370	1396
Spillback Cap Reductn	91	332	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.09	1.32	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	64	64	125	172	478	229	90	359
v/c Ratio	0.41	0.39	0.22	0.30	0.81	0.36	0.55	0.43
Control Delay	45.7	39.9	1.3	0.7	45.3	8.3	51.7	21.4
Queue Delay	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0
Total Delay	45.7	39.9	1.7	1.1	45.3	8.3	51.7	21.4
Queue Length 50th (ft)	39	33	1	0	283	13	55	151
Queue Length 95th (ft)	87	80	2	0	#551	78	117	274
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	380	388	775	745	590	645	209	880
Starvation Cap Reductn	0	0	359	272	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.16	0.30	0.36	0.81	0.36	0.43	0.41

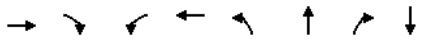
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	371	42	232	79
v/c Ratio	0.24	0.72	0.64	0.50
Control Delay	1.2	63.6	39.4	42.9
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	1.6	63.6	39.4	42.9
Queue Length 50th (ft)	17	24	130	44
Queue Length 95th (ft)	21	#88	231	97
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1635	80	500	356
Starvation Cap Reductn	802	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.53	0.46	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	491	459	164	333	291	451
v/c Ratio	0.14	0.32	0.91	0.86	0.66	0.27	0.41	0.41
Control Delay	35.6	8.5	30.4	26.4	26.4	13.0	1.6	28.6
Queue Delay	0.0	0.3	25.1	11.7	0.0	0.0	0.8	0.0
Total Delay	35.6	8.8	55.5	38.1	26.4	13.0	2.5	28.6
Queue Length 50th (ft)	33	3	376	329	31	33	1	126
Queue Length 95th (ft)	69	55	#514	#461	m153	m49	m7	177
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	464	596	588	248	1227	706	1111
Starvation Cap Reductn	0	0	117	110	0	0	194	0
Spillback Cap Reductn	0	69	96	95	0	0	0	29
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.37	1.03	0.96	0.66	0.27	0.57	0.42

Intersection Summary

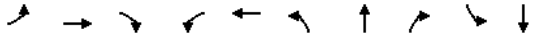
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	247	78	712	940	255	254
v/c Ratio	0.78	0.10	0.81	0.67	0.30	0.23
Control Delay	30.2	1.6	21.3	19.5	22.3	5.9
Queue Delay	0.0	0.0	0.8	2.2	0.0	0.0
Total Delay	30.2	1.6	22.0	21.7	22.3	5.9
Queue Length 50th (ft)	165	7	207	673	107	40
Queue Length 95th (ft)	238	13	m215	m804	209	92
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	921	1186	1395	851	1242
Starvation Cap Reductn	0	0	0	305	0	0
Spillback Cap Reductn	0	0	205	0	0	34
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.08	0.73	0.86	0.30	0.21

Intersection Summary

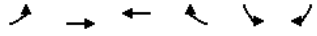
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	487	473	45	316	1111	147	499
v/c Ratio	0.21	0.16	0.06	0.76	0.74	0.31	0.34	0.70	0.62	0.80
Control Delay	35.8	35.6	20.7	33.8	32.3	35.4	23.8	2.6	32.6	29.3
Queue Delay	0.0	0.0	0.0	2.2	1.7	0.0	0.0	0.0	0.0	1.2
Total Delay	35.8	35.6	20.7	36.0	34.1	35.4	23.8	2.6	32.6	30.5
Queue Length 50th (ft)	13	11	0	238	228	21	64	0	69	218
Queue Length 95th (ft)	39	34	13	#466	#449	54	110	0	126	#413
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	338	355	308	639	641	321	1109	1583	451	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	21	64	64	0	0	0	0	78
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.85	0.82	0.14	0.28	0.70	0.33	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	747	1003	1152	263
v/c Ratio	0.68	0.16	0.55	0.72	0.88	0.35
Control Delay	51.4	13.9	19.8	15.4	34.0	4.7
Queue Delay	0.0	0.0	3.2	0.0	21.2	0.0
Total Delay	51.4	13.9	23.0	15.4	55.2	4.7
Queue Length 50th (ft)	85	53	215	525	386	14
Queue Length 95th (ft)	141	93	298	678	409	57
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1932	1348	1399	1592	858
Starvation Cap Reductn	0	0	482	0	304	0
Spillback Cap Reductn	0	0	0	0	470	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.86	0.72	1.03	0.31

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1335	1330	432	420	688	665
v/c Ratio	0.73	1.12	0.79	0.54	0.57	0.87	1.70
Control Delay	67.5	85.3	37.8	7.9	27.1	29.1	348.4
Queue Delay	0.0	145.4	0.6	0.2	0.3	459.6	356.3
Total Delay	67.5	230.7	38.5	8.1	27.5	488.7	704.7
Queue Length 50th (ft)	70	~408	308	20	229	301	~708
Queue Length 95th (ft)	m109	#508	397	m105	336	#585	#1094
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1677	803	734	794	391
Starvation Cap Reductn	0	272	103	49	0	0	0
Spillback Cap Reductn	0	44	62	0	58	454	257
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.44	0.84	0.57	0.62	2.02	4.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	482	1451	734	380	726	223	153	161	110	528	783
v/c Ratio	0.81	1.31	1.21	1.39	0.68	0.43	0.84	0.86	0.42	1.06	0.60
Control Delay	52.3	168.3	114.6	231.4	37.8	21.4	91.5	93.8	26.5	85.2	8.1
Queue Delay	378.5	221.2	57.7	0.0	0.3	0.0	0.0	0.0	0.0	78.3	1.7
Total Delay	430.9	389.5	172.3	231.4	38.1	21.4	91.5	93.8	26.5	163.5	9.8
Queue Length 50th (ft)	162	~668	~598	~358	237	74	121	127	25	~397	35
Queue Length 95th (ft)	m143	m#521	m#433	#545	304	147	m#235	m#249	m69	m#595	115
Internal Link Dist (ft)		92			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	518	183	188	261	497	1300
Starvation Cap Reductn	331	302	59	0	0	0	0	0	0	75	333
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.84	1.80	1.34	1.39	0.72	0.43	0.84	0.86	0.42	1.25	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1638	336
v/c Ratio	0.21	0.22	0.88	0.88	0.39
Control Delay	23.3	22.9	31.6	18.3	16.2
Queue Delay	1.2	0.7	5.6	0.3	0.0
Total Delay	24.5	23.5	37.3	18.6	16.2
Queue Length 50th (ft)	78	82	336	571	178
Queue Length 95th (ft)	127	114	#540	148	262
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	47	98	0	30	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.89	0.39

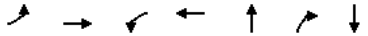
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	960	41	815	239	262	39	250	103
v/c Ratio	0.80	0.83	0.38	0.88	0.65	0.68	0.11	0.66	0.26
Control Delay	79.7	29.9	40.5	37.2	28.2	27.9	21.0	27.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.7	29.9	40.5	37.2	28.2	27.9	21.0	27.9	6.7
Queue Length 50th (ft)	37	~195	16	160	84	90	12	88	0
Queue Length 95th (ft)	#120	#337	#46	#294	156	166	35	160	34
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	116	1154	109	925	438	459	437	460	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.83	0.38	0.88	0.55	0.57	0.09	0.54	0.22

Intersection Summary

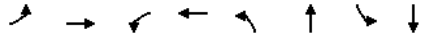
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1260	190	1186	226	237	60
v/c Ratio	0.32	0.78	1.19	0.59	0.75	0.52	0.24
Control Delay	62.3	21.5	141.4	15.0	43.0	6.8	27.9
Queue Delay	0.0	37.9	0.0	3.5	0.0	0.1	0.0
Total Delay	62.3	59.5	141.4	18.5	43.0	6.9	27.9
Queue Length 50th (ft)	14	82	~144	63	140	0	28
Queue Length 95th (ft)	m24	#698	m#160	m#447	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1619	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	702	0	0	0
Spillback Cap Reductn	0	446	0	0	0	30	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.07	1.19	0.91	0.51	0.45	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1125	78	673	587	1015	160	1217
v/c Ratio	0.81	1.02	0.76	0.81	1.07	0.82	0.78	1.16
Control Delay	62.7	43.3	84.2	43.8	99.3	36.3	57.0	114.3
Queue Delay	0.0	20.3	0.0	3.8	61.6	0.0	0.0	0.5
Total Delay	62.7	63.7	84.2	47.5	160.9	36.3	57.0	114.8
Queue Length 50th (ft)	88	~397	50	210	~214	312	99	~481
Queue Length 95th (ft)	m167	#496	#128	#303	#322	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1107	106	833	549	1243	239	1051
Starvation Cap Reductn	0	59	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	94	67	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.07	0.74	0.91	1.22	0.82	0.67	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
NO PROJECT ALTERNATIVE
2030

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1318	124	881	124	347	72	282	214
v/c Ratio	1.08	0.83	0.70	1.05	0.54	0.75	0.24	0.90	0.48
Control Delay	97.5	31.1	50.3	81.6	51.1	49.6	41.7	72.3	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	31.1	50.3	81.6	51.1	49.6	41.7	72.3	9.3
Queue Length 50th (ft)	~479	415	89	~378	82	116	44	196	0
Queue Length 95th (ft)	#697	#531	m95	m#492	142	166	88	#346	65
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1587	193	843	257	519	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.83	0.64	1.05	0.48	0.67	0.24	0.88	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

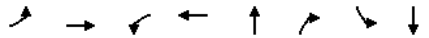
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	882	229	907	125	1081
v/c Ratio	0.84	0.67	0.93	0.91	0.76	0.49	0.90
Control Delay	34.4	12.2	39.7	81.2	37.5	50.4	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	12.2	39.7	81.2	37.5	50.4	46.0
Queue Length 50th (ft)	19	65	280	161	309	82	394
Queue Length 95th (ft)	m28	97	#406	#302	391	143	#547
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	166	1521	1022	257	1201	257	1203
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.62	0.86	0.89	0.76	0.49	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	69	59	283	137	44	126	387
v/c Ratio	0.27	0.38	0.08	0.34	0.55	0.17	0.58	0.68
Control Delay	40.0	39.0	2.6	0.9	37.6	12.1	39.0	24.4
Queue Delay	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0
Total Delay	40.0	39.0	2.8	1.2	37.6	12.1	39.0	24.4
Queue Length 50th (ft)	23	33	1	0	67	0	62	159
Queue Length 95th (ft)	66	87	6	0	148	31	140	296
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	454	474	936	963	569	537	454	1109
Starvation Cap Reductn	0	0	527	297	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.14	0.42	0.24	0.08	0.28	0.35

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	235	53	165	193
v/c Ratio	0.17	0.62	0.39	0.70
Control Delay	0.7	59.5	33.5	37.9
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	1.3	59.5	33.5	37.9
Queue Length 50th (ft)	5	24	71	93
Queue Length 95th (ft)	4	#108	169	196
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1428	96	478	454
Starvation Cap Reductn	860	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.55	0.35	0.43

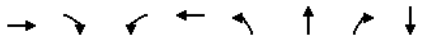
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	271	107	38	371	24	646
v/c Ratio	0.69	0.36	0.19	0.33	0.14	0.63
Control Delay	23.6	21.0	18.7	8.1	20.9	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	21.0	18.7	8.1	20.9	14.4
Queue Length 50th (ft)	47	27	11	35	7	80
Queue Length 95th (ft)	#138	62	27	157	23	#330
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	393	295	283	1109	283	1020
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.36	0.13	0.33	0.08	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	196	185	63	193	79	318
v/c Ratio	0.65	0.59	0.79	0.73	0.09	0.08	0.07	0.14
Control Delay	72.9	20.3	81.2	75.9	0.5	0.4	0.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	81.2	75.9	0.5	0.4	0.1	6.2
Queue Length 50th (ft)	45	0	126	113	1	1	0	35
Queue Length 95th (ft)	#112	56	#242	#212	1	1	0	52
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	273	701	2382	1091	2222
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.73	0.68	0.09	0.08	0.07	0.14

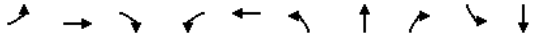
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	39	40	300	193	128	133
v/c Ratio	0.31	0.09	0.59	0.12	0.10	0.56
Control Delay	39.0	17.1	43.1	0.3	7.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	17.1	43.1	0.3	7.9	9.9
Queue Length 50th (ft)	23	1	87	1	25	0
Queue Length 95th (ft)	m45	m26	81	3	66	55
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	766	1236	1582	1233	438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.05	0.24	0.12	0.10	0.30

Intersection Summary

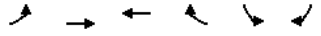
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	400	421	93	108	863	80	348
v/c Ratio	0.03	0.14	0.11	0.61	0.63	0.44	0.11	0.55	0.40	0.69
Control Delay	35.8	36.1	18.2	25.4	25.9	33.3	19.5	1.4	32.9	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.1	18.2	25.4	25.9	33.3	19.5	1.4	32.9	23.8
Queue Length 50th (ft)	2	9	0	156	167	40	18	0	34	136
Queue Length 95th (ft)	14	35	20	#370	#396	93	40	0	83	245
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	393	414	365	723	731	382	1325	1583	492	759
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.55	0.58	0.24	0.08	0.55	0.16	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	780	1053	862	151
v/c Ratio	0.38	0.22	0.58	0.73	0.85	0.26
Control Delay	39.1	4.9	19.1	11.2	34.9	4.6
Queue Delay	0.0	0.0	0.9	0.0	0.0	0.0
Total Delay	39.1	4.9	20.0	11.2	35.0	4.6
Queue Length 50th (ft)	71	31	108	480	264	0
Queue Length 95th (ft)	126	63	m210	m660	304	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2141	1342	1441	1373	724
Starvation Cap Reductn	0	0	284	0	0	0
Spillback Cap Reductn	0	1	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.74	0.73	0.64	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1023	1154	399	593	695	682
v/c Ratio	0.27	0.43	0.78	0.51	0.93	1.10	0.96
Control Delay	26.2	9.2	17.5	2.5	52.8	91.0	51.5
Queue Delay	0.0	2.1	0.4	0.1	0.0	34.3	43.0
Total Delay	26.2	11.3	17.9	2.7	52.8	125.3	94.5
Queue Length 50th (ft)	20	157	126	2	374	~495	404
Queue Length 95th (ft)	m49	144	m157	m13	#604	#742	#670
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	778	639	634	709
Starvation Cap Reductn	0	1171	0	42	0	0	0
Spillback Cap Reductn	0	68	71	0	0	44	91
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.84	0.82	0.54	0.93	1.18	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	261	1601	334	75	843	68	22	23	42	192	596
v/c Ratio	0.38	1.14	0.37	0.59	0.88	0.15	0.19	0.20	0.28	0.36	0.39
Control Delay	40.6	90.1	1.6	58.4	47.2	22.8	44.1	44.3	15.5	35.1	3.8
Queue Delay	0.0	8.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Total Delay	40.6	98.7	1.8	58.4	47.2	22.8	44.1	44.3	15.5	36.0	3.8
Queue Length 50th (ft)	75	~652	9	47	271	25	14	14	0	92	0
Queue Length 95th (ft)	m96	m#769	m14	#95	#378	59	38	40	32	m144	74
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	689	1406	889	142	956	440	185	186	212	538	1510
Starvation Cap Reductn	0	24	124	0	0	0	0	0	0	158	29
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.16	0.44	0.53	0.88	0.15	0.12	0.12	0.20	0.51	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	511	171
v/c Ratio	0.07	0.07	0.20	0.22	0.16
Control Delay	27.0	26.6	3.1	7.6	10.8
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.0	26.6	3.8	7.6	10.8
Queue Length 50th (ft)	15	14	0	63	50
Queue Length 95th (ft)	38	31	25	86	71
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2278	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.22	0.16

Intersection Summary

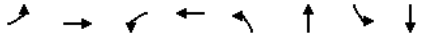
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	800	38	611	287	313	32	306	115
v/c Ratio	1.09	0.55	0.29	0.75	0.82	0.85	0.09	0.86	0.29
Control Delay	111.8	23.0	46.7	42.0	48.4	49.2	24.7	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.8	23.0	46.7	42.0	48.4	49.2	24.7	45.3	10.2
Queue Length 50th (ft)	~352	197	23	187	181	197	12	161	9
Queue Length 95th (ft)	#556	272	55	252	#283	#311	m26	#305	44
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	391	1452	159	810	407	426	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.55	0.24	0.75	0.71	0.73	0.09	0.78	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

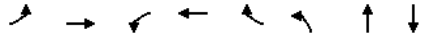
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	451	111	543	132	808	52	1042
v/c Ratio	0.87	0.68	0.64	0.73	0.65	0.46	0.41	0.67
Control Delay	99.9	34.6	52.0	37.8	46.2	18.6	45.9	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	34.6	52.0	37.8	46.2	18.6	45.9	26.3
Queue Length 50th (ft)	70	125	69	171	82	168	32	261
Queue Length 95th (ft)	#171	167	124	209	136	268	69	#450
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	892	212	1058	301	1769	230	1559
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.51	0.52	0.51	0.44	0.46	0.23	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	372	87	425	341	69	440	261
v/c Ratio	0.25	0.32	0.58	0.30	0.41	0.15	0.93	0.79
Control Delay	48.4	26.8	58.3	24.5	5.1	29.0	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.8	58.3	24.5	5.5	29.0	56.0	41.8
Queue Length 50th (ft)	16	91	53	89	0	33	265	160
Queue Length 95th (ft)	43	145	#126	174	71	69	#442	222
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1176	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.32	0.56	0.30	0.51	0.14	0.88	0.53

Intersection Summary

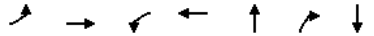
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	439	60	811	201	136	341	42	161	274
v/c Ratio	0.27	0.28	0.44	0.47	0.23	0.67	0.73	0.10	1.13	0.69
Control Delay	46.8	19.9	49.6	21.5	4.2	48.8	35.9	7.4	157.0	32.9
Queue Delay	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	19.9	49.6	23.1	4.6	48.8	35.9	7.4	157.0	32.9
Queue Length 50th (ft)	18	86	37	184	0	84	203	0	~124	125
Queue Length 95th (ft)	46	154	76	302	48	142	261	23	#255	183
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1574	165	1715	871	266	671	597	142	539
Starvation Cap Reductn	0	0	0	680	319	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.36	0.78	0.36	0.51	0.51	0.07	1.13	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

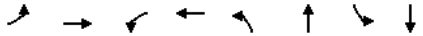


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	602	128	895	444	127	58
v/c Ratio	0.04	0.43	0.68	0.48	0.94	0.27	0.39
Control Delay	47.3	24.8	49.9	11.0	60.4	12.3	39.1
Queue Delay	0.0	0.7	0.0	0.6	0.0	0.0	0.0
Total Delay	47.3	25.4	49.9	11.6	60.4	12.3	39.1
Queue Length 50th (ft)	2	143	58	30	274	19	33
Queue Length 95th (ft)	11	231	m108	m277	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1392	208	1855	489	491	295
Starvation Cap Reductn	0	439	0	527	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.63	0.62	0.67	0.91	0.26	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	550	34	832	358	1020	175	1136
v/c Ratio	0.64	0.55	0.18	0.85	0.74	0.79	0.78	0.92
Control Delay	68.9	42.3	45.6	44.6	51.8	34.9	49.7	44.3
Queue Delay	0.0	0.0	0.0	0.1	1.4	0.0	0.0	0.1
Total Delay	68.9	42.3	45.6	44.7	53.3	34.9	49.7	44.4
Queue Length 50th (ft)	71	135	17	206	114	303	109	360
Queue Length 95th (ft)	126	231	m51	#414	#172	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1165	200	975	481	1286	301	1233
Starvation Cap Reductn	0	8	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	4	34	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.17	0.86	0.80	0.79	0.58	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	503	117	821	240	409
v/c Ratio	0.31	0.28	0.59	0.40	0.40	0.75
Control Delay	17.8	9.8	32.8	7.7	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	9.8	32.8	7.7	16.0	26.3
Queue Length 50th (ft)	19	85	33	41	25	52
Queue Length 95th (ft)	m39	m118	#86	125	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1784	212	2041	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.28	0.55	0.40	0.39	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	439	63	183	5	290
v/c Ratio	0.62	0.06	0.44	0.01	0.51
Control Delay	9.4	4.3	10.2	11.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	4.3	10.2	11.0	5.5
Queue Length 50th (ft)	36	4	18	1	10
Queue Length 95th (ft)	117	19	64	6	57
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	725	1190	646	737	840
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.05	0.28	0.01	0.35

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	565	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1345	1289
v/c Ratio	0.83	0.77	0.66	0.63
Control Delay	60.2	47.9	17.0	16.4
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	60.2	47.9	17.6	16.4
Queue Length 50th (ft)	101	147	312	290
Queue Length 95th (ft)	#170	202	393	367
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	323	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.78	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	659	1239
v/c Ratio	0.58	1.17	0.37	0.44
Control Delay	27.5	113.1	13.4	14.0
Queue Delay	0.1	0.0	3.1	0.0
Total Delay	27.6	113.1	16.6	14.0
Queue Length 50th (ft)	201	~554	117	162
Queue Length 95th (ft)	262	#790	156	196
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1304	734	1789	2792
Starvation Cap Reductn	0	0	999	0
Spillback Cap Reductn	38	0	0	204
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.17	0.83	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	697	560	701
v/c Ratio	0.71	0.46	0.88	0.29
Control Delay	25.2	15.6	45.2	5.4
Queue Delay	0.0	0.0	0.0	0.7
Total Delay	25.2	15.7	45.2	6.0
Queue Length 50th (ft)	108	104	122	53
Queue Length 95th (ft)	146	166	#206	93
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	638	2392
Starvation Cap Reductn	0	0	0	1254
Spillback Cap Reductn	47	75	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.48	0.88	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1052	156	1031	209	676	159	396	533
v/c Ratio	0.92	0.85	0.76	1.05	0.65	1.05	0.45	1.06	0.87
Control Delay	71.3	39.7	57.4	62.0	50.1	87.5	43.4	106.8	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	39.7	57.4	62.0	50.1	87.5	43.4	106.8	29.1
Queue Length 50th (ft)	219	354	107	~429	147	~266	99	~309	117
Queue Length 95th (ft)	#380	#454	m100	m#353	m189	m#367	166	#499	#319
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	645	354	373	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.65	1.05	0.45	1.06	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

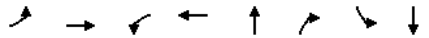
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	980	294	1424	201	1377
v/c Ratio	1.59	0.67	1.02	1.07	1.27	0.83	1.31
Control Delay	314.0	26.5	64.6	120.0	163.7	74.7	179.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	314.0	26.5	64.6	120.0	163.7	74.7	179.3
Queue Length 50th (ft)	~218	344	~368	~232	~672	140	~659
Queue Length 95th (ft)	m#284	m399	#514	#402	#812	#266	#798
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	134	1518	962	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.59	0.67	1.02	1.07	1.27	0.83	1.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	89	144	639	436	220	98	424
v/c Ratio	0.57	0.49	0.20	0.81	0.90	0.38	0.60	0.60
Control Delay	52.6	50.4	7.3	8.8	56.7	6.9	65.0	30.2
Queue Delay	0.0	0.0	2.9	82.0	0.0	0.0	0.0	0.0
Total Delay	52.6	50.4	10.2	90.8	56.7	6.9	65.0	30.2
Queue Length 50th (ft)	71	63	13	72	311	3	72	234
Queue Length 95th (ft)	128	116	m11	m0	#518	64	#143	361
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	312	327	717	789	518	600	172	750
Starvation Cap Reductn	0	0	472	245	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.27	0.59	1.17	0.84	0.37	0.57	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	402	39	375	453
v/c Ratio	0.29	0.60	1.09	1.38
Control Delay	2.5	82.4	118.7	224.3
Queue Delay	0.8	0.0	0.0	33.4
Total Delay	3.3	82.4	118.7	257.7
Queue Length 50th (ft)	38	27	~323	~458
Queue Length 95th (ft)	33	#90	#541	#698
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1359	65	345	329
Starvation Cap Reductn	636	0	0	0
Spillback Cap Reductn	0	0	0	17
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.60	1.09	1.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	465	165	172	795	20	607
v/c Ratio	1.06	0.36	0.78	0.82	0.12	0.90
Control Delay	84.1	16.8	44.8	22.9	22.8	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.1	16.8	44.8	22.9	22.8	33.4
Queue Length 50th (ft)	~171	39	56	229	8	163
Queue Length 95th (ft)	#327	82	m#128	#523	m14	m#221
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	438	464	225	972	225	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.36	0.76	0.82	0.09	0.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

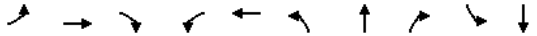
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	372	352	137	340	123	476
v/c Ratio	0.17	0.54	0.49	0.47	0.48	0.25	0.19	0.38
Control Delay	50.6	16.8	6.7	5.7	29.3	20.3	5.3	24.5
Queue Delay	0.0	0.2	1.0	0.9	0.0	0.0	0.0	0.0
Total Delay	50.6	17.1	7.7	6.6	29.3	20.3	5.3	24.5
Queue Length 50th (ft)	12	0	67	56	38	49	10	120
Queue Length 95th (ft)	35	52	90	76	m79	73	m27	164
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	747	287	1358	633	1242
Starvation Cap Reductn	0	0	181	177	0	0	0	0
Spillback Cap Reductn	0	8	138	136	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47	0.65	0.62	0.48	0.25	0.19	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	108	36	499	674	272	224
v/c Ratio	0.54	0.06	0.65	0.44	0.26	0.78
Control Delay	27.9	1.2	45.5	1.1	16.4	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	1.2	45.5	1.1	16.4	23.2
Queue Length 50th (ft)	41	0	141	4	95	68
Queue Length 95th (ft)	69	5	113	16	198	144
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	787	1155	1518	1035	509
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.05	0.43	0.44	0.26	0.44

Intersection Summary

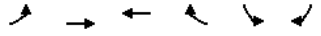


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	292	307	12	757	1353	283	666
v/c Ratio	0.59	1.20	0.21	0.79	0.83	0.13	0.89	0.85	0.86	0.81
Control Delay	45.9	150.6	28.3	41.8	43.2	47.4	46.1	6.6	48.5	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	150.6	28.3	41.8	43.2	47.4	46.1	6.6	48.5	32.2
Queue Length 50th (ft)	104	~305	22	174	185	7	237	0	165	317
Queue Length 95th (ft)	#193	#506	62	275	#297	26	#367	0	#294	#648
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	309	325	294	444	446	243	882	1583	390	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.20	0.21	0.66	0.69	0.05	0.86	0.85	0.73	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1266	1198	947	361
v/c Ratio	0.46	0.49	0.92	0.86	0.90	0.52
Control Delay	45.6	5.8	20.5	18.2	44.3	7.9
Queue Delay	0.0	0.0	155.6	0.0	1.1	0.0
Total Delay	45.6	5.8	176.2	18.2	45.4	7.9
Queue Length 50th (ft)	95	87	409	671	318	25
Queue Length 95th (ft)	160	134	m387	m641	401	102
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2225	1381	1399	1124	726
Starvation Cap Reductn	0	0	443	0	0	0
Spillback Cap Reductn	0	8	0	0	52	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.49	1.35	0.86	0.88	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1175	1739	442	603	786	560
v/c Ratio	0.45	0.79	1.03	0.58	1.07	1.33	1.61
Control Delay	64.3	14.1	56.3	6.3	93.2	188.4	313.0
Queue Delay	0.0	7.7	128.5	0.3	29.0	36.3	81.3
Total Delay	64.3	21.8	184.8	6.6	122.2	224.7	394.3
Queue Length 50th (ft)	111	84	~395	38	~496	~732	~959
Queue Length 95th (ft)	m147	102	m311	m37	#726	#994	#923
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	590	347
Starvation Cap Reductn	0	182	109	56	0	0	0
Spillback Cap Reductn	0	280	378	0	36	34	35
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.97	1.33	0.62	1.14	1.41	1.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	359	1191	745	325	1274	223	72	76	66	376	667
v/c Ratio	0.68	1.17	1.05	1.19	1.20	0.45	0.34	0.35	0.25	0.76	0.55
Control Delay	54.5	113.7	48.4	151.7	134.1	32.6	49.6	49.9	25.2	45.2	9.3
Queue Delay	0.0	23.9	5.6	0.0	114.4	0.0	0.0	0.0	0.0	10.3	0.1
Total Delay	54.5	137.6	54.0	151.7	248.4	32.6	49.6	49.9	25.2	55.4	9.4
Queue Length 50th (ft)	133	~543	~266	~271	~563	129	57	61	19	277	127
Queue Length 95th (ft)	m131	m#470	m#415	#470	#733	m218	110	113	65	#366	100
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	499	214	217	259	494	1215
Starvation Cap Reductn	0	45	10	0	0	0	0	0	0	93	56
Spillback Cap Reductn	0	0	0	0	187	0	0	0	0	0	8
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.23	1.07	1.19	1.46	0.45	0.34	0.35	0.25	0.94	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1189	301
v/c Ratio	0.17	0.17	0.44	0.57	0.49
Control Delay	32.4	31.1	8.0	15.5	44.8
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	34.7	32.4	8.5	15.5	44.8
Queue Length 50th (ft)	63	65	76	258	219
Queue Length 95th (ft)	118	104	134	320	312
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1878	2069	610
Starvation Cap Reductn	351	750	578	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.64	0.57	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1151	24	839	551	661	73	314	158
v/c Ratio	1.35	1.18	0.26	1.14	0.88	1.01	0.20	0.83	0.36
Control Delay	233.2	126.0	56.4	120.4	53.6	76.0	43.4	53.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	7.2	36.2	0.0	0.0	0.0
Total Delay	233.2	126.0	56.4	120.4	60.8	112.2	43.4	53.4	14.2
Queue Length 50th (ft)	~209	~530	17	~365	386	~509	49	216	16
Queue Length 95th (ft)	m#353	m#661	45	#493	#659	#817	m88	301	79
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	976	97	733	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	50	59	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.18	0.25	1.14	0.96	1.11	0.15	0.60	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	954	112	601	195	1592	118	1460
v/c Ratio	0.97	0.94	0.65	0.68	0.82	1.26	0.67	1.28
Control Delay	99.3	49.4	50.5	32.2	58.0	151.2	52.2	161.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	49.4	50.5	32.2	58.0	151.2	52.2	161.5
Queue Length 50th (ft)	110	273	61	152	108	~649	65	~601
Queue Length 95th (ft)	#243	#408	#118	208	#213	#786	#131	#737
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1011	197	978	256	1265	197	1142
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.94	0.57	0.61	0.76	1.26	0.60	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	946	166	792	113	236	540	711
v/c Ratio	0.31	1.17	1.34	0.81	0.23	0.49	1.10	1.45
Control Delay	50.1	124.5	234.7	43.2	7.4	35.0	106.5	241.8
Queue Delay	0.0	68.9	29.7	2.2	0.0	0.0	0.0	1.3
Total Delay	50.1	193.4	264.4	45.4	7.4	35.0	106.5	243.1
Queue Length 50th (ft)	21	~373	~139	262	0	127	~383	~626
Queue Length 95th (ft)	51	#501	#270	#390	43	202	#590	#852
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	808	124	975	500	478	489	492
Starvation Cap Reductn	0	95	0	85	0	0	0	0
Spillback Cap Reductn	0	19	6	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.33	1.41	0.89	0.23	0.49	1.10	1.45

Intersection Summary

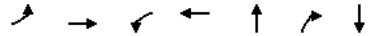
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1111	151	836	236	222	408	140	313	663
v/c Ratio	0.39	1.01	0.74	0.60	0.32	1.05	0.76	0.26	1.48	1.24
Control Delay	46.8	64.4	56.8	27.4	4.5	119.0	42.6	6.0	260.5	148.0
Queue Delay	0.0	95.7	0.0	5.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	160.1	56.8	32.7	5.0	119.0	42.6	6.0	260.5	148.0
Queue Length 50th (ft)	30	~408	93	232	0	~155	236	0	~279	~532
Queue Length 95th (ft)	64	#541	#173	314	52	#301	#354	44	m#352	m#613
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1101	230	1400	733	212	540	540	212	535
Starvation Cap Reductn	0	208	0	492	192	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.24	0.66	0.92	0.44	1.05	0.76	0.26	1.48	1.24

Intersection Summary

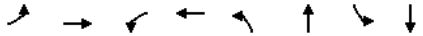
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1464	166	1130	535	302	209
v/c Ratio	0.19	1.32	0.78	0.87	1.18	0.59	0.76
Control Delay	40.1	180.3	50.4	24.3	136.2	19.4	46.7
Queue Delay	0.0	131.6	0.0	6.2	0.0	4.0	5.1
Total Delay	40.1	311.9	50.4	30.5	136.2	23.4	51.7
Queue Length 50th (ft)	19	~629	95	~400	~411	71	126
Queue Length 95th (ft)	48	#889	m53	m#280	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1110	301	1305	454	515	348
Starvation Cap Reductn	0	202	0	138	0	0	0
Spillback Cap Reductn	0	77	0	0	0	139	85
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.61	0.55	0.97	1.18	0.80	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1338	49	821	555	1431	298	1634
v/c Ratio	0.95	1.32	0.51	1.22	1.24	1.09	1.20	1.23
Control Delay	38.4	171.2	57.2	143.8	165.4	86.3	159.0	138.0
Queue Delay	2.1	22.8	0.0	6.4	0.0	1.8	0.0	21.3
Total Delay	40.6	194.0	57.2	150.2	165.4	88.1	159.0	159.3
Queue Length 50th (ft)	122	~558	32	~333	~228	~547	~232	~682
Queue Length 95th (ft)	m79	m#394	m67	m#432	#334	#685	#396	#823
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1017	106	674	446	1307	249	1333
Starvation Cap Reductn	0	38	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.37	0.46	1.23	1.24	1.10	1.20	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1054	47	800	440	485
v/c Ratio	0.25	0.53	0.26	0.41	0.66	0.86
Control Delay	20.7	11.4	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	11.4	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	162	13	43	50	52
Queue Length 95th (ft)	m17	m153	36	127	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1987	248	1954	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.53	0.19	0.41	0.64	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	553	112	349	160	771
v/c Ratio	1.08	0.13	1.09	0.21	1.01
Control Delay	84.1	13.6	110.1	12.2	55.4
Queue Delay	0.0	0.0	0.0	0.0	14.3
Total Delay	84.1	13.6	110.1	12.2	69.6
Queue Length 50th (ft)	~279	33	~209	40	~369
Queue Length 95th (ft)	#481	64	#380	79	#631
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	751	766
Starvation Cap Reductn	0	0	0	0	33
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.08	0.13	1.09	0.21	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1789	2011
v/c Ratio	1.11	0.74	0.91	1.02
Control Delay	117.3	47.0	29.0	49.2
Queue Delay	0.0	0.0	15.5	0.0
Total Delay	117.3	47.0	44.4	49.2
Queue Length 50th (ft)	~206	130	542	~766
Queue Length 95th (ft)	#315	180	#753	#922
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1976	1974
Starvation Cap Reductn	0	0	226	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.02	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1207	1937
v/c Ratio	0.62	1.57	0.77	0.62
Control Delay	30.2	291.5	17.3	12.1
Queue Delay	1.0	0.0	61.0	2.2
Total Delay	31.3	291.5	78.3	14.3
Queue Length 50th (ft)	168	~658	243	230
Queue Length 95th (ft)	227	#887	334	276
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	537	1560	3103
Starvation Cap Reductn	0	0	491	0
Spillback Cap Reductn	185	0	0	979
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	1.57	1.13	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

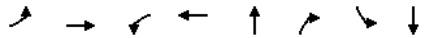
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1202	976	1044
v/c Ratio	1.14	0.96	1.01	0.44
Control Delay	113.0	53.3	71.1	9.1
Queue Delay	81.2	152.2	248.3	10.5
Total Delay	194.1	205.6	319.4	19.6
Queue Length 50th (ft)	~441	431	~360	162
Queue Length 95th (ft)	#573	#582	#500	202
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1313
Spillback Cap Reductn	125	357	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.32	1.35	1.59	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	71	64	125	351	454	229	98	561
v/c Ratio	0.46	0.39	0.19	0.48	0.89	0.38	0.59	0.73
Control Delay	51.3	44.2	4.4	1.9	50.5	7.0	60.9	31.7
Queue Delay	0.0	0.0	2.7	2.3	0.0	0.0	0.2	0.0
Total Delay	51.3	44.2	7.1	4.2	50.5	7.0	61.1	31.7
Queue Length 50th (ft)	51	38	1	0	319	6	70	335
Queue Length 95th (ft)	98	83	m13	m0	#532	67	#138	500
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	339	353	700	753	562	649	186	842
Starvation Cap Reductn	0	0	472	270	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	4	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.18	0.55	0.73	0.81	0.35	0.54	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	378	47	232	262
v/c Ratio	0.27	0.78	0.74	0.86
Control Delay	2.4	87.3	51.9	61.0
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	3.1	87.3	51.9	61.0
Queue Length 50th (ft)	37	33	161	187
Queue Length 95th (ft)	32	#106	#260	#348
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1436	71	375	339
Starvation Cap Reductn	698	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.66	0.62	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	514	481	155	295	265	461
v/c Ratio	0.14	0.32	0.92	0.88	0.65	0.25	0.39	0.42
Control Delay	35.6	9.4	33.9	29.2	32.5	16.3	2.3	29.1
Queue Delay	0.0	0.3	46.7	24.3	0.0	0.0	0.7	0.0
Total Delay	35.6	9.7	80.6	53.5	32.5	16.3	3.0	29.1
Queue Length 50th (ft)	33	6	402	363	38	37	2	131
Queue Length 95th (ft)	69	58	#552	#496	m#188	m58	m12	180
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	459	596	588	237	1195	678	1088
Starvation Cap Reductn	0	0	125	117	0	0	179	0
Spillback Cap Reductn	0	70	100	99	0	0	0	26
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.38	1.09	1.02	0.65	0.25	0.53	0.43

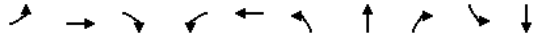
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	226	73	751	914	373	260
v/c Ratio	0.77	0.09	0.82	0.64	0.44	0.24
Control Delay	35.5	1.7	21.6	17.0	24.3	6.6
Queue Delay	0.0	0.0	1.4	1.8	0.0	0.0
Total Delay	35.5	1.7	23.0	18.7	24.3	6.6
Queue Length 50th (ft)	150	7	224	630	166	45
Queue Length 95th (ft)	226	13	m211	m763	312	103
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	899	1186	1420	856	1244
Starvation Cap Reductn	0	0	0	328	0	0
Spillback Cap Reductn	0	0	243	0	0	40
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.08	0.80	0.84	0.44	0.22

Intersection Summary

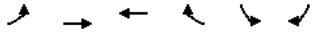
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	446	433	45	353	1132	147	541
v/c Ratio	0.22	0.17	0.07	0.75	0.73	0.32	0.34	0.72	0.63	0.78
Control Delay	35.9	35.6	20.7	33.5	32.1	35.7	23.5	2.8	33.3	31.4
Queue Delay	0.0	0.0	0.0	2.0	1.6	0.0	0.0	0.0	0.0	1.4
Total Delay	35.9	35.6	20.7	35.5	33.8	35.7	23.5	2.8	33.3	32.9
Queue Length 50th (ft)	13	11	0	211	202	21	72	0	69	244
Queue Length 95th (ft)	39	34	13	#412	#395	54	122	0	126	#466
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	596	306	1136	1583	431	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	18	59	59	0	0	0	0	63
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.83	0.81	0.15	0.31	0.72	0.34	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	778	1092	1093	282
v/c Ratio	0.68	0.19	0.56	0.78	0.88	0.38
Control Delay	51.4	12.6	18.8	18.5	34.6	4.2
Queue Delay	0.0	0.0	5.5	0.0	92.6	0.0
Total Delay	51.4	12.6	24.3	18.5	127.2	4.2
Queue Length 50th (ft)	87	60	230	592	368	9
Queue Length 95th (ft)	143	104	m309	763	394	56
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1972	1379	1399	1592	875
Starvation Cap Reductn	0	0	530	0	272	0
Spillback Cap Reductn	0	2	0	0	681	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.19	0.92	0.78	1.20	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1295	1407	484	464	738	715
v/c Ratio	0.77	1.08	0.85	0.58	0.63	0.93	1.83
Control Delay	69.1	73.1	41.4	8.6	28.9	37.4	404.3
Queue Delay	0.0	137.9	1.9	0.2	0.7	478.6	299.1
Total Delay	69.1	211.0	43.3	8.8	29.7	516.0	703.4
Queue Length 50th (ft)	76	~386	348	33	262	365	~835
Queue Length 95th (ft)	m130	#473	#430	m124	382	#672	#1228
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	831	734	795	391
Starvation Cap Reductn	0	269	93	49	0	0	0
Spillback Cap Reductn	0	49	127	0	81	439	246
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.40	0.92	0.62	0.71	2.07	4.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	368	1538	827	380	816	223	153	161	110	536	821
v/c Ratio	0.62	1.46	1.36	1.39	0.77	0.44	0.84	0.86	0.42	1.08	0.63
Control Delay	49.4	233.2	184.1	231.4	40.8	22.8	91.5	93.8	26.5	89.5	8.9
Queue Delay	228.1	266.6	35.1	0.0	0.5	0.0	0.0	0.0	0.0	82.0	2.2
Total Delay	277.5	499.8	219.2	231.4	41.3	22.8	91.5	93.8	26.5	171.5	11.0
Queue Length 50th (ft)	124	~790	~676	~358	275	80	121	127	25	~407	46
Queue Length 95th (ft)	m107	m#624	m#563	#545	350	153	m#235	m#249	m69	m#582	m133
Internal Link Dist (ft)		92			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	606	274	1062	512	183	188	261	497	1293
Starvation Cap Reductn	347	306	33	0	0	0	0	0	0	76	322
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	73
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.50	2.05	1.44	1.39	0.81	0.44	0.84	0.86	0.42	1.27	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

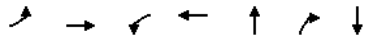
Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1666	439
v/c Ratio	0.22	0.22	0.83	0.89	0.51
Control Delay	23.4	23.0	28.4	19.1	19.2
Queue Delay	1.2	0.7	2.2	0.3	0.0
Total Delay	24.6	23.7	30.6	19.4	19.2
Queue Length 50th (ft)	79	82	311	587	267
Queue Length 95th (ft)	127	114	370	148	380
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	42	87	0	23	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.91	0.51

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1092	43	831	291	337	40	308	107
v/c Ratio	1.00	1.00	0.41	0.95	0.73	0.81	0.10	0.76	0.25
Control Delay	126.5	53.8	43.3	47.4	33.4	36.5	21.2	33.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	53.8	43.3	47.4	33.4	36.5	21.2	33.4	6.7
Queue Length 50th (ft)	~52	~286	18	~181	111	130	13	118	0
Queue Length 95th (ft)	#142	#405	#51	#302	#212	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	110	1093	104	876	428	449	425	448	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.00	0.41	0.95	0.68	0.75	0.09	0.69	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1556	190	1435	469	238	79
v/c Ratio	0.34	1.17	1.19	0.84	1.06	0.48	0.31
Control Delay	58.4	108.2	129.2	21.7	97.0	16.0	30.5
Queue Delay	0.0	145.3	0.0	95.0	0.0	0.1	0.0
Total Delay	58.4	253.5	129.2	116.7	97.0	16.1	30.5
Queue Length 50th (ft)	12	~580	~144	330	~330	45	42
Queue Length 95th (ft)	m27	#915	m#117	m#491	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	526	0	0	0
Spillback Cap Reductn	0	291	0	0	0	12	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.49	1.19	1.21	1.06	0.49	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1333	78	831	655	1232	170	1504
v/c Ratio	0.90	1.21	0.76	1.01	1.19	1.00	0.80	1.43
Control Delay	60.7	110.4	84.2	73.4	141.7	59.5	59.7	226.9
Queue Delay	0.0	35.3	0.0	51.6	327.6	0.0	0.0	1.2
Total Delay	60.7	145.7	84.2	125.0	469.3	59.5	59.7	228.1
Queue Length 50th (ft)	113	~534	50	~300	~261	~451	105	~687
Queue Length 95th (ft)	m138	m#426	#128	#424	#373	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1103	106	819	549	1232	239	1054
Starvation Cap Reductn	0	68	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	96	209	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.29	0.74	1.15	1.93	1.00	0.71	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
PREFERRED PROJECT ALTERNATIVE
BASE YEAR

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1172	111	692	93	233	64	195	202
v/c Ratio	0.97	0.67	0.65	0.67	0.51	0.62	0.25	0.73	0.50
Control Delay	68.2	22.4	47.3	54.9	50.0	44.8	42.3	52.9	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	22.4	47.3	54.9	50.0	44.8	42.3	52.9	9.2
Queue Length 50th (ft)	375	305	77	271	63	75	40	133	0
Queue Length 95th (ft)	#596	431	m138	#354	113	113	79	205	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1762	193	1031	257	519	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.67	0.58	0.67	0.36	0.45	0.21	0.61	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	725	141	584	123	781
v/c Ratio	0.47	0.78	0.83	0.67	0.38	0.48	0.49
Control Delay	19.2	20.5	35.4	54.1	23.0	50.1	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	20.5	35.4	54.1	23.0	50.1	23.4
Queue Length 50th (ft)	18	163	242	96	141	81	194
Queue Length 95th (ft)	m25	109	285	160	212	141	294
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	225	1522	1213	257	1518	257	1597
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.57	0.60	0.55	0.38	0.48	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	258	90	39	309	25	457
v/c Ratio	0.63	0.31	0.20	0.28	0.14	0.45
Control Delay	19.1	20.0	18.7	8.0	21.0	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	20.0	18.7	8.0	21.0	9.9
Queue Length 50th (ft)	38	22	11	28	7	49
Queue Length 95th (ft)	#116	54	31	131	24	171
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	409	286	283	1109	283	1024
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.31	0.14	0.28	0.09	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

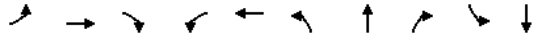
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	332	311	152	338
v/c Ratio	0.21	0.19	0.19	0.22
Control Delay	6.1	3.0	1.8	16.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.1	3.0	1.8	16.7
Queue Length 50th (ft)	19	3	0	66
Queue Length 95th (ft)	32	3	m0	95
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1575	1628	810	1516
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.19	0.19	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

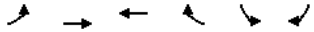
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	105	16	242	171	77	141
v/c Ratio	0.55	0.03	0.49	0.11	0.07	0.47
Control Delay	44.3	28.8	41.1	0.4	9.7	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	28.8	41.1	0.4	9.7	8.9
Queue Length 50th (ft)	72	2	62	2	16	0
Queue Length 95th (ft)	128	22	47	4	47	53
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	812	1236	1512	1171	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.02	0.20	0.11	0.07	0.32

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	329	346	96	40	697	65	316
v/c Ratio	0.03	0.12	0.10	0.62	0.64	0.41	0.04	0.44	0.31	0.58
Control Delay	35.0	35.1	18.1	23.0	23.3	31.3	18.3	0.9	31.9	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	35.1	18.1	23.0	23.3	31.3	18.3	0.9	31.9	21.1
Queue Length 50th (ft)	2	8	0	111	118	34	5	0	23	99
Queue Length 95th (ft)	14	36	20	265	278	95	18	0	71	220
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	451	474	415	742	753	438	1519	1583	552	841
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.44	0.46	0.22	0.03	0.44	0.12	0.38

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	824	691	139
v/c Ratio	0.38	0.19	0.49	0.57	0.84	0.29
Control Delay	39.3	3.7	18.0	4.9	36.9	5.4
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	39.3	3.7	18.3	4.9	36.9	5.4
Queue Length 50th (ft)	72	24	113	243	218	0
Queue Length 95th (ft)	129	52	m158	m264	254	42
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2301	1522	1441	1373	717
Starvation Cap Reductn	0	0	315	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.61	0.57	0.50	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	847	923	318	527	635	623
v/c Ratio	0.24	0.35	0.62	0.44	0.84	0.97	0.85
Control Delay	19.2	9.8	16.7	2.5	41.1	50.7	33.7
Queue Delay	0.0	1.1	0.1	0.0	0.0	0.7	0.1
Total Delay	19.2	10.9	16.8	2.5	41.1	51.3	33.8
Queue Length 50th (ft)	14	149	97	0	314	340	312
Queue Length 95th (ft)	41	138	129	10	#505	#608	#545
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	331	2390	1484	723	639	661	730
Starvation Cap Reductn	0	1232	0	0	0	0	0
Spillback Cap Reductn	0	96	38	0	0	3	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.73	0.64	0.44	0.82	0.97	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	442	1201	347	49	647	85	24	25	46	138	562
v/c Ratio	0.64	0.85	0.38	0.38	0.68	0.19	0.21	0.21	0.30	0.25	0.37
Control Delay	46.5	21.7	1.5	38.7	25.9	13.3	44.6	44.7	15.4	34.4	7.5
Queue Delay	0.0	1.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	23.6	1.6	38.7	25.9	13.3	44.6	44.7	15.4	34.4	7.5
Queue Length 50th (ft)	145	267	9	29	109	15	15	15	0	79	0
Queue Length 95th (ft)	m180	m#524	m14	m49	141	m34	41	43	34	131	69
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	688	1405	913	142	956	447	185	186	215	542	1516
Starvation Cap Reductn	0	95	125	0	0	0	0	0	0	0	81
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.92	0.44	0.35	0.68	0.19	0.13	0.13	0.21	0.25	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	382	99
v/c Ratio	0.03	0.03	0.14	0.08	0.22	0.25	0.15
Control Delay	19.4	19.0	2.4	45.0	19.4	18.0	33.8
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.0	33.8
Queue Length 50th (ft)	8	9	0	4	0	77	60
Queue Length 95th (ft)	26	22	21	19	24	110	105
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1553	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.25	0.15

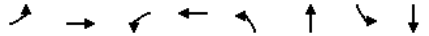
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	617	37	487	233	216	28	153	101
v/c Ratio	0.71	0.35	0.28	0.60	0.76	0.68	0.12	0.63	0.34
Control Delay	27.2	10.4	46.6	36.8	43.5	40.0	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	10.4	46.6	36.8	43.5	40.0	31.3	38.9	9.9
Queue Length 50th (ft)	226	112	22	141	146	129	16	95	0
Queue Length 95th (ft)	m#427	m222	54	196	222	199	29	100	39
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	544	1739	159	810	409	428	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.35	0.23	0.60	0.57	0.50	0.08	0.39	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

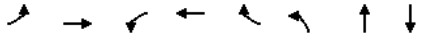
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	288	97	422	112	548	53	702
v/c Ratio	0.63	0.52	0.59	0.71	0.61	0.28	0.41	0.39
Control Delay	65.8	28.6	50.0	39.4	45.6	13.3	45.9	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	28.6	50.0	39.4	45.6	13.3	45.9	16.9
Queue Length 50th (ft)	47	63	60	133	69	94	33	140
Queue Length 95th (ft)	#108	103	111	176	120	152	70	221
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	904	212	1056	301	1981	230	1821
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.32	0.46	0.40	0.37	0.28	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

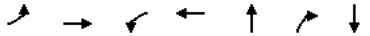


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	228	47	322	66	50	91	38
v/c Ratio	0.25	0.11	0.38	0.15	0.07	0.29	0.46	0.16
Control Delay	48.0	11.2	50.1	11.3	4.6	42.4	31.3	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	11.2	50.1	11.3	4.6	42.4	31.3	28.6
Queue Length 50th (ft)	16	27	29	32	0	30	38	17
Queue Length 95th (ft)	42	72	64	105	26	66	87	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1994	140	2145	986	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.11	0.34	0.15	0.07	0.10	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	207	55	404	168	128	240	42	65	144
v/c Ratio	0.28	0.12	0.42	0.22	0.19	0.65	0.57	0.13	0.52	0.42
Control Delay	46.9	15.6	48.9	17.1	4.3	48.1	34.4	9.0	58.2	31.8
Queue Delay	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.6	48.9	17.5	4.8	48.1	34.4	9.0	58.2	31.8
Queue Length 50th (ft)	19	27	34	66	0	79	150	0	42	87
Queue Length 95th (ft)	47	70	71	142	44	135	181	25	88	93
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1691	164	1834	901	266	671	489	142	537
Starvation Cap Reductn	0	0	0	957	404	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.12	0.34	0.46	0.34	0.48	0.36	0.09	0.46	0.27

Intersection Summary

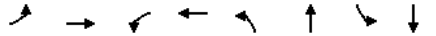


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	300	75	566	164	120	37
v/c Ratio	0.04	0.17	0.53	0.27	0.87	0.28	0.26
Control Delay	47.3	17.8	50.2	8.1	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.8	50.2	8.3	52.9	6.6	37.5
Queue Length 50th (ft)	2	54	43	21	99	0	21
Queue Length 95th (ft)	11	115	m90	182	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1802	195	2098	237	515	323
Starvation Cap Reductn	0	0	0	718	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.38	0.41	0.69	0.23	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	305	32	472	252	785	147	795
v/c Ratio	0.62	0.51	0.19	0.81	0.52	0.45	0.73	0.48
Control Delay	59.9	40.3	47.7	43.9	44.3	20.1	47.6	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	40.3	47.7	43.9	44.3	20.1	47.6	20.9
Queue Length 50th (ft)	44	42	18	108	77	177	92	188
Queue Length 95th (ft)	122	136	m50	187	118	288	149	277
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1023	185	763	481	1764	301	1661
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.30	0.17	0.62	0.52	0.45	0.49	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	332	7	475	145	318
v/c Ratio	0.27	0.15	0.05	0.23	0.27	0.60
Control Delay	12.3	5.8	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	5.8	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	41	2	20	16	36
Queue Length 95th (ft)	m24	86	11	66	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2250	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.23	0.24	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1014	853
v/c Ratio	0.57	0.58	0.44	0.37
Control Delay	46.2	43.7	9.8	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.8	8.9
Queue Length 50th (ft)	58	76	153	118
Queue Length 95th (ft)	92	112	236	186
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.44	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	477	750
v/c Ratio	0.36	0.96	0.24	0.24
Control Delay	26.0	29.7	10.6	10.3
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	26.0	29.7	11.2	10.3
Queue Length 50th (ft)	93	233	78	85
Queue Length 95th (ft)	130	#481	110	110
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1298	816	1990	3071
Starvation Cap Reductn	0	0	1106	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.88	0.54	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	517	240	534
v/c Ratio	0.51	0.26	0.48	0.20
Control Delay	22.3	8.9	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	8.9	28.9	3.2
Queue Length 50th (ft)	41	52	50	24
Queue Length 95th (ft)	71	95	78	45
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1951	638	2689
Starvation Cap Reductn	0	0	0	1600
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.26	0.38	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	813	114	867	185	563	141	278	501
v/c Ratio	0.87	0.59	0.62	0.79	0.59	0.90	0.44	0.83	0.83
Control Delay	61.6	28.8	68.9	28.8	47.9	55.3	43.2	56.3	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	28.8	68.9	28.8	47.9	55.3	43.2	56.3	20.8
Queue Length 50th (ft)	194	238	77	280	128	202	88	187	71
Queue Length 95th (ft)	#330	317	m119	#433	m185	m#284	149	#303	#246
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1373	225	1100	322	646	354	373	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.59	0.51	0.79	0.57	0.87	0.40	0.75	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	841	187	1057	197	976
v/c Ratio	0.79	0.73	0.83	0.76	0.69	0.82	0.64
Control Delay	45.4	33.6	34.7	58.7	29.5	72.7	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	33.6	34.7	58.7	29.5	72.7	28.9
Queue Length 50th (ft)	78	310	291	126	288	137	267
Queue Length 95th (ft)	m117	m334	291	#217	#516	#258	#475
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	181	1518	1385	274	1539	241	1523
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.53	0.61	0.68	0.69	0.82	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	384	162	177	699	21	481
v/c Ratio	0.87	0.34	0.80	0.72	0.12	0.72
Control Delay	41.2	16.4	45.7	18.2	22.4	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	16.4	45.7	18.2	22.4	20.8
Queue Length 50th (ft)	111	37	58	191	8	109
Queue Length 95th (ft)	#253	79	m#127	#444	m16	166
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	442	474	225	975	225	670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.34	0.79	0.72	0.09	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	776	430	240	511
v/c Ratio	0.48	0.27	0.30	0.35
Control Delay	9.8	2.8	0.7	20.3
Queue Delay	1.3	0.4	0.9	0.0
Total Delay	11.1	3.3	1.6	20.3
Queue Length 50th (ft)	152	11	0	120
Queue Length 95th (ft)	94	m10	m0	161
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1610	1609	807	1475
Starvation Cap Reductn	581	715	333	0
Spillback Cap Reductn	121	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.48	0.51	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	222	37	513	664	214	263
v/c Ratio	0.79	0.05	0.59	0.46	0.24	0.65
Control Delay	25.2	0.2	25.6	2.5	20.4	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	0.2	25.6	2.5	20.4	15.9
Queue Length 50th (ft)	62	0	65	18	90	49
Queue Length 95th (ft)	117	1	71	13	168	128
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	858	1155	1433	894	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.04	0.44	0.46	0.24	0.47

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	240	254	12	697	1234	274	615
v/c Ratio	0.56	1.16	0.21	0.72	0.76	0.12	0.83	0.78	0.83	0.75
Control Delay	43.2	133.6	27.5	37.5	38.2	46.5	38.8	3.9	44.0	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	133.6	27.5	37.5	38.2	46.5	38.8	3.9	44.0	27.8
Queue Length 50th (ft)	100	~291	22	135	145	7	196	0	149	254
Queue Length 95th (ft)	#202	#524	64	224	237	26	#322	0	#281	#574
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	331	348	313	456	458	256	921	1583	409	830
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.16	0.21	0.53	0.55	0.05	0.76	0.78	0.67	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1150	1099	797	359
v/c Ratio	0.47	0.45	0.79	0.79	0.85	0.52
Control Delay	45.8	4.6	14.3	14.7	41.2	5.2
Queue Delay	0.0	0.0	120.1	0.0	0.2	0.0
Total Delay	45.8	4.6	134.4	14.7	41.4	5.2
Queue Length 50th (ft)	97	62	334	590	272	0
Queue Length 95th (ft)	163	117	m352	m593	323	64
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2315	1461	1399	1124	760
Starvation Cap Reductn	0	0	551	0	0	0
Spillback Cap Reductn	0	6	0	0	36	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.45	1.26	0.79	0.73	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1072	1651	500	598	740	495
v/c Ratio	0.45	0.72	0.98	0.66	1.06	1.28	1.41
Control Delay	65.7	12.8	45.9	10.2	90.5	166.9	223.8
Queue Delay	0.0	1.6	92.9	0.4	7.8	2.0	0.0
Total Delay	65.7	14.4	138.8	10.6	98.4	168.8	223.8
Queue Length 50th (ft)	110	68	352	62	~488	~679	~781
Queue Length 95th (ft)	m165	100	m#442	m77	#716	#936	#1133
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	753	565	579	352
Starvation Cap Reductn	0	238	117	48	0	0	0
Spillback Cap Reductn	0	85	333	0	11	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.86	1.22	0.71	1.08	1.28	1.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	500	925	636	282	1075	193	78	82	72	381	808
v/c Ratio	0.94	0.92	0.90	1.03	1.01	0.39	0.36	0.38	0.27	0.77	0.67
Control Delay	60.9	38.0	18.9	108.6	69.5	27.4	50.2	50.5	24.8	36.2	5.9
Queue Delay	0.0	3.5	1.3	0.0	81.7	0.0	0.0	0.0	0.0	10.7	0.1
Total Delay	60.9	41.5	20.2	108.6	151.2	27.4	50.2	50.5	24.8	46.9	6.0
Queue Length 50th (ft)	190	276	284	~214	~408	87	63	66	20	202	25
Queue Length 95th (ft)	m195	m294	m327	#382	#554	154	116	121	68	#385	48
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	499	214	217	264	495	1208
Starvation Cap Reductn	0	41	14	0	0	0	0	0	0	91	35
Spillback Cap Reductn	0	0	0	0	177	0	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.96	0.92	1.03	1.21	0.39	0.36	0.38	0.27	0.94	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1018	251
v/c Ratio	0.13	0.12	0.45	0.42	0.51	0.64	0.38
Control Delay	30.3	29.2	5.9	50.5	12.6	25.2	40.2
Queue Delay	1.3	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	31.7	29.2	6.6	50.5	12.6	25.2	40.2
Queue Length 50th (ft)	51	50	0	35	0	282	180
Queue Length 95th (ft)	102	82	131	73	52	352	259
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1734	241	307	1603	668
Starvation Cap Reductn	377	0	577	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.67	0.21	0.34	0.64	0.38

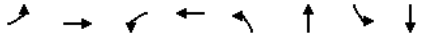
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	876	22	675	528	484	63	215	170
v/c Ratio	1.14	0.84	0.24	0.92	0.72	0.63	0.25	0.82	0.47
Control Delay	160.0	45.0	55.7	61.8	34.6	31.1	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	4.8	2.7	0.0	0.0	0.0
Total Delay	160.0	45.0	55.7	61.8	39.5	33.8	43.8	49.2	12.1
Queue Length 50th (ft)	~153	281	15	245	283	248	39	134	3
Queue Length 95th (ft)	#295	#471	42	#356	#533	457	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1041	97	731	732	763	499	525	556
Starvation Cap Reductn	0	0	0	0	141	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.84	0.23	0.92	0.89	0.82	0.13	0.41	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

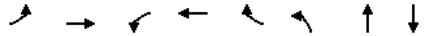


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	820	109	469	152	1189	122	1053
v/c Ratio	0.76	0.85	0.64	0.54	0.71	0.91	0.69	0.85
Control Delay	59.5	37.9	49.9	29.4	47.6	40.1	53.4	37.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	37.9	49.9	29.4	47.6	40.1	53.4	37.3
Queue Length 50th (ft)	78	217	60	112	83	~386	67	307
Queue Length 95th (ft)	#165	#312	113	158	145	#520	#137	#467
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	982	197	977	256	1311	197	1237
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.84	0.55	0.48	0.59	0.91	0.62	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	831	87	641	29	203	232	182
v/c Ratio	0.25	0.53	0.57	0.35	0.04	0.71	0.74	0.65
Control Delay	48.1	24.2	57.5	19.2	9.7	41.2	33.1	39.3
Queue Delay	0.0	1.2	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	48.1	25.4	57.5	19.8	9.7	41.2	33.1	39.3
Queue Length 50th (ft)	16	184	53	98	0	126	114	109
Queue Length 95th (ft)	42	#413	#120	269	23	176	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1575	158	1840	802	478	492	492
Starvation Cap Reductn	0	485	0	783	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.76	0.55	0.61	0.04	0.42	0.47	0.37

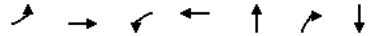
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	717	153	541	173	198	299	125	173	384
v/c Ratio	0.39	0.56	0.74	0.35	0.23	0.93	0.68	0.27	0.85	0.90
Control Delay	46.8	27.7	56.3	22.0	4.6	92.0	38.1	6.2	70.5	42.6
Queue Delay	0.0	1.1	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.8	56.3	22.8	4.9	92.0	38.1	6.2	70.5	42.6
Queue Length 50th (ft)	31	187	94	123	0	127	173	0	112	237
Queue Length 95th (ft)	67	268	#177	192	46	#263	247	42	#224	288
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1285	234	1531	744	212	540	530	212	531
Starvation Cap Reductn	0	326	0	647	245	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.65	0.61	0.35	0.93	0.55	0.24	0.82	0.72

Intersection Summary

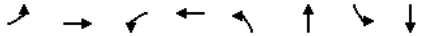
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	925	135	836	328	255	191
v/c Ratio	0.18	0.71	0.70	0.57	0.86	0.50	0.71
Control Delay	40.0	32.9	52.4	18.3	47.6	8.6	45.0
Queue Delay	0.0	9.9	0.0	0.3	0.0	0.0	0.0
Total Delay	40.0	42.8	52.4	18.6	47.6	8.6	45.0
Queue Length 50th (ft)	19	257	90	107	201	12	115
Queue Length 95th (ft)	47	#471	m56	m#285	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1304	301	1454	452	562	348
Starvation Cap Reductn	0	354	0	189	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.97	0.45	0.66	0.73	0.45	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	880	50	581	443	1051	241	1163
v/c Ratio	0.91	0.90	0.50	0.91	0.99	0.78	0.95	0.84
Control Delay	56.6	35.4	60.4	47.3	85.6	32.4	90.0	34.7
Queue Delay	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	56.6	37.4	60.4	47.3	85.6	32.4	90.0	35.6
Queue Length 50th (ft)	142	73	33	179	147	311	155	353
Queue Length 95th (ft)	m#243	#345	m70	#242	#249	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	253	982	109	679	446	1349	253	1377
Starvation Cap Reductn	0	36	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.93	0.46	0.86	0.99	0.78	0.95	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	716	10	586	276	377
v/c Ratio	0.10	0.32	0.07	0.27	0.49	0.66
Control Delay	20.9	6.4	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	6.4	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	92	3	26	35	36
Queue Length 95th (ft)	m7	m112	14	79	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2219	248	2175	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.32	0.04	0.27	0.43	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1280	1420
v/c Ratio	0.69	0.63	0.59	0.66
Control Delay	46.8	43.3	14.3	15.6
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.7	15.6
Queue Length 50th (ft)	90	88	252	298
Queue Length 95th (ft)	131	127	374	441
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2171	2165
Starvation Cap Reductn	0	0	395	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.72	0.66

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	908	1324
v/c Ratio	0.31	1.02	0.47	0.43
Control Delay	25.4	65.8	10.5	9.7
Queue Delay	0.1	0.0	5.0	0.1
Total Delay	25.5	65.8	15.5	9.8
Queue Length 50th (ft)	75	~275	134	131
Queue Length 95th (ft)	111	#498	178	161
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	588	1946	3103
Starvation Cap Reductn	0	0	956	0
Spillback Cap Reductn	148	0	0	562
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.02	0.92	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	936	643	767
v/c Ratio	0.82	0.60	0.82	0.30
Control Delay	44.3	26.3	43.5	6.6
Queue Delay	0.3	0.7	12.7	1.8
Total Delay	44.6	27.0	56.2	8.4
Queue Length 50th (ft)	216	255	223	94
Queue Length 95th (ft)	272	378	270	137
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1532
Spillback Cap Reductn	34	310	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.75	0.97	0.78

Intersection Summary

1009: Shellmound Way & Christie Ave

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	1000	377	428	449
v/c Ratio	0.58	0.25	0.49	0.33
Control Delay	7.5	11.8	8.3	22.5
Queue Delay	1.8	0.0	4.7	0.0
Total Delay	9.4	11.8	13.0	22.5
Queue Length 50th (ft)	53	74	209	110
Queue Length 95th (ft)	66	m78	m252	151
Internal Link Dist (ft)	342	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1732	1480	873	1350
Starvation Cap Reductn	538	0	365	0
Spillback Cap Reductn	201	0	18	19
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.25	0.84	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

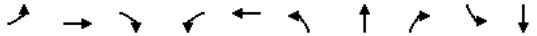
1010: Shellmound Way & Shellmound St

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	384	55	717	873	250	300
v/c Ratio	0.88	0.06	0.79	0.69	0.35	0.28
Control Delay	25.5	0.1	17.4	18.2	28.6	7.0
Queue Delay	0.5	0.0	0.0	1.5	0.0	0.0
Total Delay	26.0	0.1	17.4	19.8	28.6	7.0
Queue Length 50th (ft)	107	0	190	607	128	58
Queue Length 95th (ft)	#262	m1	m219	731	222	118
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1010	1186	1267	708	1126
Starvation Cap Reductn	12	0	0	218	0	0
Spillback Cap Reductn	0	0	9	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.05	0.61	0.83	0.35	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

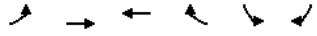
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	412	401	45	268	966	130	462
v/c Ratio	0.19	0.15	0.06	0.68	0.66	0.28	0.29	0.61	0.55	0.74
Control Delay	35.6	35.5	20.7	27.8	27.1	35.0	22.4	1.8	32.1	25.8
Queue Delay	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.2
Total Delay	35.6	35.5	20.7	28.1	27.4	35.0	22.4	1.8	32.1	26.0
Queue Length 50th (ft)	13	11	0	190	182	21	52	0	61	196
Queue Length 95th (ft)	39	34	13	#367	#351	54	93	0	115	#367
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	372	392	339	671	673	355	1211	1583	491	773
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	16	46	46	0	0	0	0	31
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.02	0.66	0.64	0.13	0.22	0.61	0.26	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	641	913	967	263
v/c Ratio	0.68	0.14	0.43	0.65	0.88	0.38
Control Delay	51.4	10.5	14.9	12.4	36.4	3.7
Queue Delay	0.0	0.0	1.5	0.0	5.0	0.0
Total Delay	51.4	10.5	16.3	12.4	41.4	3.7
Queue Length 50th (ft)	85	44	149	436	330	0
Queue Length 95th (ft)	141	78	256	579	363	50
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2142	1499	1399	1592	875
Starvation Cap Reductn	0	0	631	0	190	0
Spillback Cap Reductn	0	64	0	0	547	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.14	0.74	0.65	0.93	0.30

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1143	1149	452	404	596	574
v/c Ratio	0.74	0.95	0.68	0.55	0.55	0.75	1.46
Control Delay	66.5	38.4	30.7	7.3	26.5	19.4	242.5
Queue Delay	0.0	124.8	0.3	0.2	0.2	374.3	465.1
Total Delay	66.5	163.2	31.0	7.5	26.8	393.8	707.6
Queue Length 50th (ft)	67	313	278	67	217	198	~945
Queue Length 95th (ft)	m126	#375	340	m119	320	369	#840
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1679	816	734	797	394
Starvation Cap Reductn	0	309	122	47	0	0	0
Spillback Cap Reductn	0	130	46	0	48	471	260
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.29	0.74	0.59	0.59	1.83	4.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	561	1109	620	293	480	183	153	161	110	467	861
v/c Ratio	0.95	0.95	1.01	1.07	0.45	0.34	0.84	0.86	0.42	0.94	0.64
Control Delay	56.0	24.5	26.8	119.0	32.9	14.7	91.5	93.8	26.5	52.3	18.4
Queue Delay	434.9	142.2	41.0	0.0	0.0	0.1	0.0	0.0	0.0	50.6	0.5
Total Delay	490.9	166.7	67.8	119.0	32.9	14.8	91.5	93.8	26.5	103.0	19.0
Queue Length 50th (ft)	188	223	~172	~230	144	39	121	127	25	302	97
Queue Length 95th (ft)	m193	m233	m#176	#401	193	98	m#235	m#249	m69	#512	152
Internal Link Dist (ft)		92			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1169	616	274	1062	533	183	188	261	499	1344
Starvation Cap Reductn	310	332	63	0	0	0	0	0	0	80	169
Spillback Cap Reductn	19	0	0	0	0	40	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.98	1.32	1.12	1.07	0.45	0.37	0.84	0.86	0.42	1.11	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

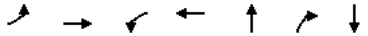
Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1369	308
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.84	0.47
Control Delay	31.3	30.4	33.1	50.5	12.1	22.5	32.3
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.0	0.0
Total Delay	32.5	31.1	35.1	50.5	12.6	22.5	32.3
Queue Length 50th (ft)	65	68	256	38	0	494	203
Queue Length 95th (ft)	135	117	381	78	57	600	311
Internal Link Dist (ft)		150				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1637	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	11	0	0	0	37	3	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.45	0.84	0.47

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	684	40	670	210	187	38	190	97
v/c Ratio	0.58	0.43	0.34	0.47	0.61	0.51	0.12	0.55	0.26
Control Delay	51.1	16.9	38.1	21.3	25.0	22.7	20.9	24.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	16.9	38.1	21.3	25.0	22.7	20.9	24.4	6.8
Queue Length 50th (ft)	26	79	14	112	68	56	11	62	0
Queue Length 95th (ft)	#93	#204	44	#217	137	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	125	1599	118	1438	454	474	450	474	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.43	0.34	0.47	0.46	0.39	0.08	0.40	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



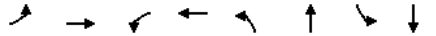
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1013	165	1035	204	197	59
v/c Ratio	0.32	0.61	1.04	0.51	0.72	0.48	0.24
Control Delay	62.3	13.8	106.3	13.3	42.4	7.0	27.7
Queue Delay	0.0	0.1	0.0	1.0	0.0	0.0	0.0
Total Delay	62.3	13.9	106.3	14.3	42.4	7.0	27.7
Queue Length 50th (ft)	13	35	~116	66	126	0	27
Queue Length 95th (ft)	m21	#516	m#175	m#417	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1660	159	2032	441	530	445
Starvation Cap Reductn	0	0	0	680	0	0	0
Spillback Cap Reductn	0	62	0	0	0	3	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.63	1.04	0.77	0.46	0.37	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	913	75	523	501	728	123	943
v/c Ratio	0.81	0.82	0.74	0.62	0.93	0.57	0.68	0.91
Control Delay	63.6	16.8	80.7	36.6	64.3	28.0	50.5	45.3
Queue Delay	0.0	1.0	0.0	0.6	5.8	0.0	0.0	0.1
Total Delay	63.6	17.9	80.7	37.2	70.1	28.0	50.5	45.4
Queue Length 50th (ft)	84	257	48	154	163	192	77	292
Queue Length 95th (ft)	#218	#42	#121	212	#258	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1114	106	848	549	1278	239	1041
Starvation Cap Reductn	0	61	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	28	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.87	0.71	0.69	0.96	0.57	0.51	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

SYNCHRO QUEUE SHEETS
PREFERRED PROJECT ALTERNATIVE
2010

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1233	109	813	123	300	64	220	208
v/c Ratio	0.97	0.73	0.64	0.85	0.58	0.69	0.24	0.78	0.50
Control Delay	67.5	25.8	51.7	57.7	51.8	46.5	41.8	56.0	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	25.8	51.7	57.7	51.8	46.5	41.8	56.0	9.2
Queue Length 50th (ft)	374	356	78	321	83	98	40	149	0
Queue Length 95th (ft)	#593	476	m119	#464	141	142	79	#234	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1687	193	951	257	521	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.73	0.56	0.85	0.48	0.58	0.21	0.68	0.47

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

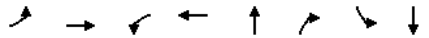
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	757	204	760	124	940
v/c Ratio	0.76	0.73	0.79	0.83	0.54	0.48	0.67
Control Delay	23.5	16.6	32.9	68.5	28.6	50.2	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	16.6	32.9	68.5	28.6	50.2	30.9
Queue Length 50th (ft)	25	82	237	141	215	82	283
Queue Length 95th (ft)	m31	87	273	#258	314	142	#432
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	212	1522	1192	257	1396	257	1412
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.58	0.64	0.79	0.54	0.48	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	69	73	167	183	68	125	262
v/c Ratio	0.24	0.30	0.13	0.29	0.29	0.11	0.50	0.29
Control Delay	34.6	33.4	1.2	0.4	29.9	8.8	33.1	15.7
Queue Delay	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Delay	34.6	33.4	1.2	0.5	29.9	8.8	33.1	15.7
Queue Length 50th (ft)	20	25	1	0	68	0	47	67
Queue Length 95th (ft)	69	83	2	0	174	36	132	166
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	622	649	949	942	869	795	622	1174
Starvation Cap Reductn	0	0	316	246	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.12	0.24	0.21	0.09	0.20	0.22

Intersection Summary

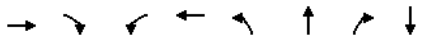
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	257	26	178	73
v/c Ratio	0.17	0.40	0.55	0.35
Control Delay	0.5	36.4	31.1	32.7
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	0.8	36.4	31.1	32.7
Queue Length 50th (ft)	4	9	66	26
Queue Length 95th (ft)	5	44	172	85
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1682	131	655	619
Starvation Cap Reductn	865	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.20	0.27	0.12

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	288	115	38	323	24	539
v/c Ratio	0.74	0.39	0.19	0.29	0.14	0.53
Control Delay	28.2	21.7	18.4	7.8	20.9	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	21.7	18.4	7.8	20.9	11.2
Queue Length 50th (ft)	55	29	10	30	7	61
Queue Length 95th (ft)	#158	67	27	137	23	#216
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	387	293	283	1109	283	1021
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.39	0.13	0.29	0.08	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	204	192	62	277	143	389
v/c Ratio	0.65	0.59	0.81	0.75	0.10	0.12	0.13	0.18
Control Delay	72.9	20.3	80.5	74.8	0.5	0.4	0.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	80.5	74.8	0.5	0.4	0.2	6.5
Queue Length 50th (ft)	45	0	142	128	1	1	0	44
Queue Length 95th (ft)	#112	56	#254	#225	m1	1	0	63
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	649	2376	1109	2219
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.76	0.71	0.10	0.12	0.13	0.18

Intersection Summary

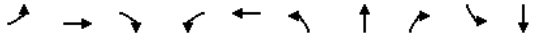
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	98	45	266	232	88	180
v/c Ratio	0.55	0.10	0.58	0.15	0.07	0.56
Control Delay	38.4	20.7	40.4	0.4	8.6	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	20.7	40.4	0.4	8.6	8.6
Queue Length 50th (ft)	57	9	65	2	18	0
Queue Length 95th (ft)	m101	m30	76	5	47	59
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	816	1236	1525	1201	475
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.06	0.22	0.15	0.07	0.38

Intersection Summary

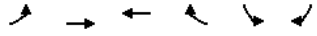
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	382	403	93	92	882	80	323
v/c Ratio	0.03	0.13	0.11	0.62	0.64	0.43	0.09	0.56	0.38	0.63
Control Delay	35.6	35.9	18.2	24.5	25.0	32.8	19.4	1.4	32.5	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	35.9	18.2	24.5	25.0	32.8	19.4	1.4	32.5	22.7
Queue Length 50th (ft)	2	9	0	142	152	38	15	0	33	120
Queue Length 95th (ft)	14	35	20	#347	#370	93	35	0	83	225
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	416	438	385	735	744	404	1388	1583	517	788
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.52	0.54	0.23	0.07	0.56	0.15	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	727	1058	817	136
v/c Ratio	0.37	0.20	0.52	0.73	0.85	0.25
Control Delay	39.1	4.6	17.3	12.3	35.5	4.9
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	39.1	4.6	18.0	12.3	35.6	4.9
Queue Length 50th (ft)	70	26	98	528	255	0
Queue Length 95th (ft)	126	56	m165	m686	292	39
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2183	1395	1441	1373	715
Starvation Cap Reductn	0	0	326	0	0	0
Spillback Cap Reductn	0	1	0	0	23	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.68	0.73	0.61	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	966	1142	367	555	654	642
v/c Ratio	0.24	0.40	0.77	0.49	0.87	1.02	0.90
Control Delay	24.0	9.2	18.1	2.5	44.8	66.7	40.2
Queue Delay	0.0	1.8	0.2	0.1	0.0	6.1	3.2
Total Delay	24.0	11.0	18.2	2.7	44.8	72.8	43.4
Queue Length 50th (ft)	16	150	134	6	338	~406	352
Queue Length 95th (ft)	m42	139	186	m18	#547	#665	#600
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	756	639	641	715
Starvation Cap Reductn	0	1208	0	40	0	0	0
Spillback Cap Reductn	0	142	33	0	0	12	31
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.82	0.79	0.51	0.87	1.04	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	408	1375	389	79	782	84	23	24	44	224	691
v/c Ratio	0.60	0.98	0.41	0.61	0.82	0.19	0.19	0.20	0.28	0.42	0.46
Control Delay	45.4	37.1	1.6	60.1	42.5	22.4	44.0	44.0	15.4	36.4	4.7
Queue Delay	0.0	11.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0
Total Delay	45.4	48.5	1.8	60.1	42.5	22.4	44.0	44.0	15.4	37.7	4.7
Queue Length 50th (ft)	128	~323	8	49	245	30	14	15	0	111	4
Queue Length 95th (ft)	m162	m#642	m14	#106	318	69	40	41	32	m169	78
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	679	1396	930	142	956	443	185	186	213	538	1502
Starvation Cap Reductn	0	59	110	0	0	0	0	0	0	156	26
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.03	0.47	0.56	0.82	0.19	0.12	0.13	0.21	0.59	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

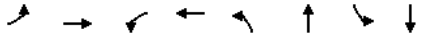
Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	512	139
v/c Ratio	0.07	0.07	0.23	0.22	0.13
Control Delay	26.0	25.7	2.6	7.6	10.3
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.0	25.7	3.3	7.6	10.3
Queue Length 50th (ft)	14	14	1	64	40
Queue Length 95th (ft)	38	31	23	87	56
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1189	2278	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.22	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	747	38	565	254	248	29	212	108
v/c Ratio	0.85	0.46	0.29	0.70	0.80	0.74	0.11	0.74	0.32
Control Delay	55.0	18.7	46.7	39.8	44.7	41.8	28.1	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	18.7	46.7	39.8	44.7	41.8	28.1	38.9	10.3
Queue Length 50th (ft)	251	150	23	170	159	150	13	131	1
Queue Length 95th (ft)	#538	245	55	231	243	231	30	152	40
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	488	1630	159	810	407	426	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.46	0.24	0.70	0.62	0.58	0.08	0.54	0.26

Intersection Summary

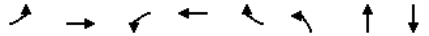
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	404	105	463	134	634	52	872
v/c Ratio	0.80	0.60	0.62	0.69	0.65	0.35	0.41	0.53
Control Delay	87.5	32.9	51.1	38.0	46.2	15.8	45.9	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	32.9	51.1	38.0	46.2	15.8	45.9	22.0
Queue Length 50th (ft)	63	106	65	145	83	117	32	197
Queue Length 95th (ft)	#154	150	118	183	137	193	69	317
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	897	212	1058	301	1836	230	1630
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.45	0.50	0.44	0.45	0.35	0.23	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



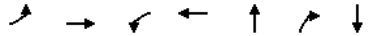
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	367	45	365	186	69	197	88
v/c Ratio	0.24	0.20	0.37	0.18	0.19	0.27	0.74	0.37
Control Delay	47.9	14.9	49.9	14.5	4.0	37.5	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	14.9	49.9	14.5	4.0	37.5	40.7	36.0
Queue Length 50th (ft)	16	54	28	43	0	40	116	50
Queue Length 95th (ft)	42	132	62	136	49	76	180	81
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1843	138	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.33	0.18	0.19	0.14	0.40	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	337	55	555	183	139	268	41	126	205
v/c Ratio	0.27	0.21	0.42	0.31	0.21	0.68	0.63	0.10	0.89	0.57
Control Delay	46.8	17.5	48.9	18.4	4.3	49.1	34.9	7.4	98.1	31.1
Queue Delay	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.5	48.9	19.2	4.7	49.1	34.9	7.4	98.1	31.1
Queue Length 50th (ft)	18	53	34	100	0	86	166	0	86	99
Queue Length 95th (ft)	46	115	71	196	46	145	202	23	#196	119
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1642	164	1785	889	266	671	596	142	538
Starvation Cap Reductn	0	0	0	878	385	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.21	0.34	0.61	0.36	0.52	0.40	0.07	0.89	0.38

Intersection Summary

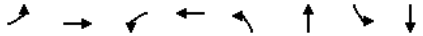
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	466	128	702	247	127	38
v/c Ratio	0.04	0.27	0.67	0.32	0.79	0.34	0.25
Control Delay	47.3	18.0	57.1	8.6	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.3	57.1	8.8	42.7	7.2	36.5
Queue Length 50th (ft)	2	86	82	18	153	0	21
Queue Length 95th (ft)	11	176	m122	m228	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1756	210	2227	487	520	329
Starvation Cap Reductn	0	676	0	731	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.43	0.61	0.47	0.51	0.24	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	445	34	648	307	834	168	974
v/c Ratio	0.63	0.58	0.20	0.90	0.64	0.53	0.77	0.64
Control Delay	61.2	31.2	47.2	48.0	47.3	24.3	49.1	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.2	31.2	47.2	48.0	47.3	24.3	49.1	26.7
Queue Length 50th (ft)	44	54	17	161	96	213	105	268
Queue Length 95th (ft)	120	186	m49	#263	141	318	168	368
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1036	182	787	481	1583	301	1515
Starvation Cap Reductn	0	0	0	0	0	0	0	72
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.43	0.19	0.82	0.64	0.53	0.56	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	431	82	638	240	394
v/c Ratio	0.28	0.22	0.44	0.31	0.40	0.73
Control Delay	16.2	8.8	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	8.8	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	20	80	23	30	25	51
Queue Length 95th (ft)	m29	115	55	93	51	#104
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2044	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.22	0.39	0.31	0.39	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.51	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	658	594	1096	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1128	1101
v/c Ratio	0.77	0.74	0.54	0.53
Control Delay	54.3	46.4	14.4	14.1
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.7	14.1
Queue Length 50th (ft)	94	136	230	221
Queue Length 95th (ft)	#144	185	302	291
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	389	631	2085	2079
Starvation Cap Reductn	0	0	372	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.66	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	544	1058
v/c Ratio	0.44	0.98	0.30	0.37
Control Delay	25.4	44.7	12.4	12.8
Queue Delay	0.0	0.0	1.4	0.0
Total Delay	25.4	44.7	13.8	12.8
Queue Length 50th (ft)	136	312	93	132
Queue Length 95th (ft)	184	#578	126	162
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	782	1830	2850
Starvation Cap Reductn	0	0	1049	0
Spillback Cap Reductn	14	0	0	55
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.97	0.70	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	581	457	623
v/c Ratio	0.68	0.36	0.75	0.25
Control Delay	25.3	13.4	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.5
Total Delay	25.3	13.4	34.4	5.1
Queue Length 50th (ft)	93	79	96	42
Queue Length 95th (ft)	130	129	#143	75
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1612	638	2462
Starvation Cap Reductn	0	0	0	1350
Spillback Cap Reductn	35	6	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.36	0.72	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1019	146	974	196	604	146	325	509
v/c Ratio	0.90	0.80	0.72	0.96	0.61	0.94	0.43	0.90	0.83
Control Delay	67.1	36.4	60.7	47.7	48.7	62.3	42.8	67.3	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.4	60.7	47.7	48.7	62.3	42.8	67.3	23.4
Queue Length 50th (ft)	210	336	99	~389	138	220	91	224	87
Queue Length 95th (ft)	#361	424	m111	m#433	m183	m#305	154	#383	#270
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1276	225	1016	322	646	354	373	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.65	0.96	0.61	0.93	0.41	0.87	0.82

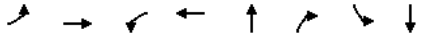
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	914	284	1221	196	1244
v/c Ratio	1.34	0.62	0.82	1.04	1.09	0.81	1.18
Control Delay	211.0	25.8	33.5	110.4	91.7	72.2	127.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	211.0	25.8	33.5	110.4	91.7	72.2	127.7
Queue Length 50th (ft)	~194	314	282	~217	~512	136	~553
Queue Length 95th (ft)	m#274	m375	374	#386	#650	#257	#691
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	155	1517	1120	274	1118	241	1050
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.34	0.62	0.82	1.04	1.09	0.81	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	108	89	174	351	479	241	94	312
v/c Ratio	0.59	0.46	0.26	0.53	0.94	0.41	0.61	0.43
Control Delay	50.6	48.1	1.3	1.5	67.6	9.6	61.1	26.2
Queue Delay	0.0	0.0	0.9	1.4	0.0	0.0	0.0	0.0
Total Delay	50.6	48.1	2.2	2.9	67.6	9.6	61.1	26.2
Queue Length 50th (ft)	74	59	2	0	332	16	64	149
Queue Length 95th (ft)	139	116	m3	m0	#624	90	#137	265
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	327	340	785	755	511	590	180	744
Starvation Cap Reductn	0	0	391	227	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.26	0.44	0.66	0.94	0.41	0.52	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	417	35	404	141
v/c Ratio	0.28	0.51	0.94	0.69
Control Delay	1.6	68.2	74.0	50.1
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	2.2	68.2	74.0	50.1
Queue Length 50th (ft)	24	22	282	93
Queue Length 95th (ft)	30	#80	#550	167
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1479	69	430	308
Starvation Cap Reductn	676	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.51	0.94	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	461	181	172	738	20	564
v/c Ratio	1.05	0.39	0.78	0.76	0.12	0.84
Control Delay	82.0	17.5	44.3	20.0	22.8	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	17.5	44.3	20.0	22.8	26.2
Queue Length 50th (ft)	~168	44	56	205	8	129
Queue Length 95th (ft)	#323	89	m#128	#476	m14	m#207
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	437	468	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.39	0.76	0.76	0.09	0.84

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

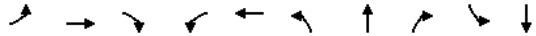
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	378	359	144	423	242	504
v/c Ratio	0.17	0.54	0.50	0.48	0.53	0.31	0.34	0.41
Control Delay	50.6	16.8	8.2	7.4	30.9	20.3	4.8	25.1
Queue Delay	0.0	0.2	0.7	0.6	0.0	0.5	0.5	0.0
Total Delay	50.6	17.1	8.9	8.0	30.9	20.8	5.4	25.1
Queue Length 50th (ft)	12	0	71	63	42	64	18	130
Queue Length 95th (ft)	35	52	117	107	m53	m70	m22	176
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	747	272	1358	706	1238
Starvation Cap Reductn	0	0	106	104	0	521	188	0
Spillback Cap Reductn	0	8	141	140	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47	0.62	0.59	0.53	0.51	0.47	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	224	39	471	715	217	267
v/c Ratio	0.74	0.06	0.63	0.51	0.23	0.63
Control Delay	29.5	0.6	37.8	2.1	18.6	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	0.6	37.8	2.1	18.6	16.0
Queue Length 50th (ft)	89	0	104	6	84	51
Queue Length 95th (ft)	209	2	110	17	166	127
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	874	1155	1411	937	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.04	0.41	0.51	0.23	0.48

Intersection Summary

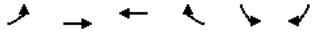


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	328	343	12	724	1355	283	635
v/c Ratio	0.59	1.21	0.22	0.84	0.87	0.13	0.89	0.86	0.86	0.79
Control Delay	47.0	157.6	28.7	45.5	47.5	47.6	45.3	6.7	49.6	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	157.6	28.7	45.5	47.5	47.6	45.3	6.7	49.6	31.7
Queue Length 50th (ft)	109	~322	23	203	214	7	235	0	171	312
Queue Length 95th (ft)	#193	#506	62	#342	#364	26	#342	0	#294	#605
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	305	321	290	444	446	240	865	1583	385	808
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.21	0.22	0.74	0.77	0.05	0.84	0.86	0.74	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1235	1152	1002	347
v/c Ratio	0.46	0.47	0.90	0.82	0.92	0.50
Control Delay	45.4	5.3	17.9	16.6	47.3	8.9
Queue Delay	0.0	0.0	171.7	0.0	5.7	0.0
Total Delay	45.4	5.3	189.6	16.6	53.0	8.9
Queue Length 50th (ft)	94	71	392	643	344	33
Queue Length 95th (ft)	158	114	m357	m567	#461	110
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2200	1365	1399	1124	707
Starvation Cap Reductn	0	0	473	0	0	0
Spillback Cap Reductn	0	15	0	0	88	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.38	0.82	0.97	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1276	1787	432	601	824	586
v/c Ratio	0.44	0.86	1.06	0.57	1.06	1.40	1.70
Control Delay	64.6	15.4	66.4	6.1	92.1	215.7	352.2
Queue Delay	0.0	20.3	126.5	0.3	30.5	30.0	75.8
Total Delay	64.6	35.7	192.9	6.4	122.7	245.7	428.0
Queue Length 50th (ft)	108	82	~540	33	~493	~796	~1033
Queue Length 95th (ft)	m137	m98	m#402	m33	#723	#1061	#1005
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	761	565	590	344
Starvation Cap Reductn	0	157	107	56	0	0	0
Spillback Cap Reductn	0	250	361	0	38	27	31
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.03	1.35	0.61	1.14	1.46	1.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	553	1124	771	342	1236	268	76	80	69	416	731
v/c Ratio	1.04	1.11	1.10	1.25	1.16	0.53	0.36	0.37	0.26	0.84	0.60
Control Delay	78.4	89.5	70.4	174.5	119.7	33.9	50.0	50.4	25.1	51.0	9.0
Queue Delay	0.0	22.2	7.9	0.0	153.9	0.0	0.0	0.0	0.0	24.0	0.1
Total Delay	78.4	111.7	78.4	174.5	273.6	33.9	50.0	50.4	25.1	75.0	9.1
Queue Length 50th (ft)	~222	~491	~461	~296	~533	155	61	64	19	291	86
Queue Length 95th (ft)	m194	m#392	m#306	#494	#697	254	113	118	66	#445	122
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1011	700	274	1062	504	214	217	262	494	1209
Starvation Cap Reductn	0	45	12	0	0	0	0	0	0	86	50
Spillback Cap Reductn	0	0	0	0	243	0	0	0	0	0	10
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	1.16	1.12	1.25	1.51	0.53	0.36	0.37	0.26	1.02	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1188	256
v/c Ratio	0.17	0.17	0.45	0.57	0.42
Control Delay	33.2	32.1	7.8	15.5	40.4
Queue Delay	2.3	1.3	0.4	0.0	0.0
Total Delay	35.5	33.3	8.3	15.5	40.4
Queue Length 50th (ft)	62	65	73	257	177
Queue Length 95th (ft)	118	104	134	319	266
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1919	2069	610
Starvation Cap Reductn	352	752	548	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.63	0.57	0.42

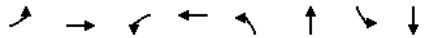
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1076	21	802	531	565	72	256	160
v/c Ratio	1.24	1.04	0.23	1.09	0.78	0.80	0.24	0.80	0.40
Control Delay	198.3	72.0	55.4	102.9	40.9	41.2	47.3	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	4.4	7.6	0.0	0.0	0.0
Total Delay	198.3	72.0	55.4	102.9	45.3	48.8	47.3	54.1	15.9
Queue Length 50th (ft)	~182	220	15	~336	307	330	51	187	13
Queue Length 95th (ft)	#332	#612	41	#462	#577	#612	100	273	86
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1037	97	733	677	707	499	525	549
Starvation Cap Reductn	0	0	0	0	88	108	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.04	0.22	1.09	0.90	0.94	0.14	0.49	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

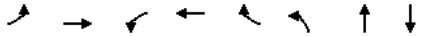


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	889	107	563	188	1408	118	1256
v/c Ratio	0.83	0.89	0.64	0.64	0.80	1.09	0.67	1.07
Control Delay	69.8	42.7	49.4	31.4	55.8	84.9	52.2	80.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	42.7	49.4	31.4	55.8	84.9	52.2	80.5
Queue Length 50th (ft)	90	245	59	141	104	~526	65	~466
Queue Length 95th (ft)	#194	#361	112	194	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	994	197	977	256	1287	197	1169
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.89	0.54	0.58	0.73	1.09	0.60	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	903	84	709	58	232	270	313
v/c Ratio	0.26	0.66	0.58	0.46	0.08	0.74	0.80	0.84
Control Delay	48.8	30.7	58.8	25.4	8.4	41.4	36.0	43.2
Queue Delay	0.0	2.4	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	33.1	58.8	25.9	8.4	41.4	36.0	43.2
Queue Length 50th (ft)	17	246	52	174	0	143	140	191
Queue Length 95th (ft)	44	#467	#127	#328	32	200	206	266
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1363	152	1541	693	478	491	494
Starvation Cap Reductn	0	320	0	401	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.87	0.55	0.62	0.08	0.49	0.55	0.63

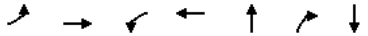
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	843	148	614	222	221	343	140	256	505
v/c Ratio	0.39	0.75	0.74	0.43	0.30	1.04	0.65	0.26	1.21	0.97
Control Delay	46.8	35.1	56.0	24.3	4.6	117.8	37.5	6.0	164.6	60.2
Queue Delay	0.0	6.3	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	41.4	56.0	25.4	4.9	117.8	37.5	6.0	164.6	60.2
Queue Length 50th (ft)	30	253	91	157	0	~153	190	0	~202	317
Queue Length 95th (ft)	64	330	#168	220	50	#300	286	44	#363	#486
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1124	230	1423	733	212	540	540	212	533
Starvation Cap Reductn	0	230	0	536	194	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.94	0.64	0.69	0.41	1.04	0.64	0.26	1.21	0.95

Intersection Summary

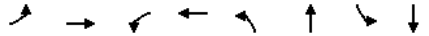
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1140	166	955	336	301	193
v/c Ratio	0.18	0.93	0.75	0.66	0.87	0.56	0.72
Control Delay	39.9	46.8	49.6	20.0	48.4	9.2	45.1
Queue Delay	0.0	85.8	0.0	0.6	0.0	1.7	3.3
Total Delay	39.9	132.6	49.6	20.7	48.4	10.9	48.4
Queue Length 50th (ft)	18	360	103	131	205	17	116
Queue Length 95th (ft)	46	#652	m59	m271	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1232	301	1446	452	589	349
Starvation Cap Reductn	0	277	0	190	0	0	0
Spillback Cap Reductn	0	161	0	0	0	149	83
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.19	0.55	0.76	0.74	0.68	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1087	49	700	509	1282	281	1343
v/c Ratio	0.92	1.08	0.51	1.03	1.14	0.98	1.08	1.00
Control Delay	49.6	74.8	59.7	77.9	127.7	52.7	123.1	55.0
Queue Delay	0.0	15.1	0.0	0.0	17.9	0.0	0.0	13.0
Total Delay	49.6	89.9	59.7	77.9	145.6	52.7	123.1	68.0
Queue Length 50th (ft)	111	~378	32	~241	~196	418	~210	~453
Queue Length 95th (ft)	m#135	m#440	m66	#334	#299	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1008	106	678	446	1307	259	1349
Starvation Cap Reductn	0	33	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	16	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.11	0.46	1.03	1.18	0.98	1.08	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	875	47	702	440	450
v/c Ratio	0.14	0.44	0.26	0.33	0.66	0.83
Control Delay	20.7	9.3	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	9.3	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	126	13	35	50	51
Queue Length 95th (ft)	m9	m142	36	101	88	#117
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	248	2116	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.19	0.33	0.64	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1603	1674
v/c Ratio	1.08	0.74	0.81	0.85
Control Delay	107.2	47.0	23.1	24.9
Queue Delay	0.0	0.0	2.6	0.0
Total Delay	107.2	47.0	25.7	24.9
Queue Length 50th (ft)	~197	129	438	475
Queue Length 95th (ft)	#306	180	557	605
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1974
Starvation Cap Reductn	0	0	252	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.93	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1096	1610
v/c Ratio	0.45	1.39	0.66	0.52
Control Delay	27.1	211.1	13.9	10.7
Queue Delay	0.3	0.0	30.9	0.3
Total Delay	27.4	211.1	44.8	11.0
Queue Length 50th (ft)	113	~546	194	173
Queue Length 95th (ft)	159	#770	263	209
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	555	1659	3103
Starvation Cap Reductn	0	0	618	0
Spillback Cap Reductn	158	0	0	793
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.39	1.05	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1091	788	905
v/c Ratio	0.96	0.82	0.88	0.38
Control Delay	61.0	37.6	46.6	8.4
Queue Delay	27.8	48.0	145.2	4.9
Total Delay	88.7	85.6	191.8	13.3
Queue Length 50th (ft)	308	370	269	133
Queue Length 95th (ft)	#437	#475	341	168
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1327	967	2384
Starvation Cap Reductn	0	0	370	1392
Spillback Cap Reductn	92	334	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.10	1.32	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	79	63	139	99	457	247	18	370
v/c Ratio	0.46	0.35	0.24	0.17	0.79	0.38	0.11	0.45
Control Delay	45.8	39.2	1.3	0.3	44.2	7.6	45.8	22.2
Queue Delay	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0
Total Delay	45.8	39.2	1.8	0.8	44.2	7.6	45.8	22.2
Queue Length 50th (ft)	48	32	1	0	267	10	11	159
Queue Length 95th (ft)	102	78	2	0	#526	77	35	288
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	375	389	775	792	582	657	206	876
Starvation Cap Reductn	0	0	358	431	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	2	4	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.16	0.33	0.27	0.79	0.38	0.09	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	401	42	271	79
v/c Ratio	0.26	0.72	0.74	0.50
Control Delay	1.7	65.0	41.9	43.2
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	2.2	65.0	41.9	43.2
Queue Length 50th (ft)	27	24	156	44
Queue Length 95th (ft)	40	#90	274	98
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1624	79	493	357
Starvation Cap Reductn	819	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.53	0.55	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	545	508	164	382	436	517
v/c Ratio	0.14	0.34	0.95	0.89	0.80	0.33	0.56	0.49
Control Delay	35.6	14.7	39.6	32.7	33.6	13.0	3.5	31.4
Queue Delay	0.0	0.4	65.2	43.5	0.0	0.5	2.7	0.1
Total Delay	35.6	15.1	104.8	76.2	33.6	13.5	6.3	31.5
Queue Length 50th (ft)	33	24	390	356	31	36	19	152
Queue Length 95th (ft)	69	80	#624	#560	m134	m45	m31	206
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	434	596	588	204	1154	779	1049
Starvation Cap Reductn	0	0	102	94	0	406	229	0
Spillback Cap Reductn	15	70	120	119	0	0	29	72
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.41	1.14	1.08	0.80	0.51	0.79	0.53

Intersection Summary

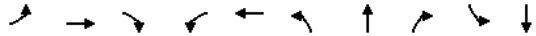
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	391	78	712	964	274	359
v/c Ratio	0.89	0.09	0.84	0.76	0.37	0.33
Control Delay	30.5	1.1	23.6	28.1	27.9	7.2
Queue Delay	2.2	0.0	0.2	3.4	0.0	0.0
Total Delay	32.8	1.1	23.8	31.5	27.9	7.2
Queue Length 50th (ft)	244	5	235	722	139	72
Queue Length 95th (ft)	#398	m8	m241	m823	241	145
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1020	1186	1265	741	1153
Starvation Cap Reductn	38	0	0	209	0	0
Spillback Cap Reductn	0	0	89	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.08	0.65	0.91	0.37	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

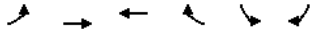


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	518	503	45	320	1232	147	504
v/c Ratio	0.21	0.16	0.06	0.82	0.79	0.31	0.34	0.78	0.62	0.80
Control Delay	35.8	35.6	20.7	37.4	35.5	35.4	23.8	3.8	32.6	29.5
Queue Delay	0.0	0.0	0.0	5.0	3.6	0.0	0.0	0.0	0.0	1.8
Total Delay	35.8	35.6	20.7	42.4	39.1	35.4	23.8	3.8	32.6	31.3
Queue Length 50th (ft)	13	11	0	261	248	21	64	0	69	220
Queue Length 95th (ft)	39	34	13	#506	#489	54	112	0	126	#419
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	336	354	307	635	636	320	1108	1583	449	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	24	70	70	0	0	0	0	98
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.92	0.89	0.14	0.29	0.78	0.33	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1012: Powell St & Frontage Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	813	1062	1218	263
v/c Ratio	0.68	0.16	0.62	0.76	0.90	0.35
Control Delay	51.4	14.5	21.7	17.9	34.3	5.2
Queue Delay	0.0	0.0	6.0	0.0	44.4	0.0
Total Delay	51.4	14.5	27.7	17.9	78.6	5.2
Queue Length 50th (ft)	85	56	240	553	404	18
Queue Length 95th (ft)	141	93	m315	m731	443	63
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1882	1319	1399	1592	852
Starvation Cap Reductn	0	0	444	0	327	0
Spillback Cap Reductn	0	0	0	0	474	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.93	0.76	1.09	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

1013: Powell St & I-80 EB Off-Ramp

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1401	1455	438	420	729	706
v/c Ratio	0.73	1.17	0.87	0.54	0.57	0.92	1.81
Control Delay	67.8	107.2	39.2	6.8	27.1	36.0	394.3
Queue Delay	0.0	140.6	4.1	0.2	0.2	568.4	309.4
Total Delay	67.8	247.8	43.2	7.0	27.3	604.4	703.7
Queue Length 50th (ft)	72	~432	357	18	229	354	~815
Queue Length 95th (ft)	m106	#546	#495	m95	336	#658	#1206
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1676	806	734	793	391
Starvation Cap Reductn	0	254	101	52	0	0	0
Spillback Cap Reductn	0	157	157	0	40	472	260
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.49	0.96	0.58	0.61	2.27	5.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	629	1451	734	380	726	268	153	161	110	568	914
v/c Ratio	1.06	1.31	1.21	1.39	0.68	0.50	0.84	0.86	0.42	1.15	0.70
Control Delay	81.2	168.5	114.8	231.4	37.8	22.6	91.5	93.8	26.5	113.1	11.2
Queue Delay	540.4	247.3	73.4	0.0	0.3	0.0	0.0	0.0	0.0	94.7	3.9
Total Delay	621.7	415.8	188.2	231.4	38.1	22.6	91.5	93.8	26.5	207.8	15.1
Queue Length 50th (ft)	~247	~669	~594	~358	237	92	121	127	25	~459	71
Queue Length 95th (ft)	m178	m#476	m#209	#545	304	175	m#235	m#249	m69	m#609	m195
Internal Link Dist (ft)		92			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	531	183	188	261	496	1300
Starvation Cap Reductn	317	327	73	0	0	0	0	0	0	79	296
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	118
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.28	1.86	1.38	1.39	0.72	0.50	0.84	0.86	0.42	1.36	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1662	353
v/c Ratio	0.21	0.22	0.88	0.89	0.41
Control Delay	23.3	22.9	31.8	18.9	12.7
Queue Delay	1.2	0.7	5.6	0.5	0.0
Total Delay	24.5	23.6	37.4	19.5	12.7
Queue Length 50th (ft)	78	82	336	585	190
Queue Length 95th (ft)	127	114	#540	148	257
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	81	169	0	37	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.91	0.41

Intersection Summary

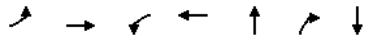
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	1001	41	834	267	262	39	250	103
v/c Ratio	0.81	0.87	0.38	0.91	0.72	0.67	0.11	0.66	0.26
Control Delay	81.2	32.7	40.8	40.4	30.0	27.9	21.1	28.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.2	32.7	40.8	40.4	30.0	27.9	21.1	28.1	6.7
Queue Length 50th (ft)	37	~217	16	168	96	90	12	90	0
Queue Length 95th (ft)	#120	#355	#46	#304	#175	166	35	160	34
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	115	1151	109	918	437	458	434	457	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.87	0.38	0.91	0.61	0.57	0.09	0.55	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



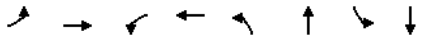
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1278	190	1209	226	237	60
v/c Ratio	0.32	0.79	1.19	0.60	0.75	0.52	0.24
Control Delay	62.1	22.1	139.8	15.3	43.0	6.8	27.9
Queue Delay	0.0	44.0	0.0	4.2	0.0	0.1	0.0
Total Delay	62.1	66.1	139.8	19.4	43.0	6.9	27.9
Queue Length 50th (ft)	14	86	~143	63	140	0	28
Queue Length 95th (ft)	m24	#713	m#157	m#456	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1619	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	699	0	0	0
Spillback Cap Reductn	0	446	0	0	0	30	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.09	1.19	0.93	0.51	0.45	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1143	78	683	600	1015	160	1217
v/c Ratio	0.81	1.03	0.76	0.82	1.09	0.82	0.78	1.16
Control Delay	62.6	47.4	84.2	44.5	106.6	36.3	57.0	114.3
Queue Delay	0.0	21.5	0.0	4.5	66.6	0.0	0.0	0.5
Total Delay	62.6	68.9	84.2	49.0	173.2	36.3	57.0	114.8
Queue Length 50th (ft)	88	~407	50	214	~223	312	99	~481
Queue Length 95th (ft)	m165	#506	#128	#311	#332	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1109	106	834	549	1243	239	1051
Starvation Cap Reductn	0	58	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	69	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.09	0.74	0.92	1.25	0.82	0.67	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
PREFERRED PROJECT ALTERNATIVE
2030

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1319	124	881	126	350	72	284	214
v/c Ratio	1.08	0.83	0.70	1.05	0.55	0.75	0.24	0.91	0.48
Control Delay	97.5	31.3	49.8	82.1	51.3	49.8	41.7	73.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	31.3	49.8	82.1	51.3	49.8	41.7	73.2	9.3
Queue Length 50th (ft)	~479	416	87	~380	84	117	44	198	0
Queue Length 95th (ft)	#697	#534	m94	m#479	145	167	88	#351	65
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1582	193	840	257	519	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.83	0.64	1.05	0.49	0.67	0.24	0.88	0.48

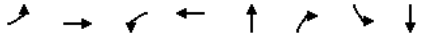
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	886	229	926	125	1087
v/c Ratio	0.84	0.66	0.94	0.91	0.78	0.49	0.91
Control Delay	34.7	12.0	41.1	81.2	38.8	50.4	47.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	12.0	41.1	81.2	38.8	50.4	47.8
Queue Length 50th (ft)	19	65	285	161	318	82	~401
Queue Length 95th (ft)	m28	96	#416	#302	#405	143	#552
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	165	1521	1006	257	1185	257	1190
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.62	0.88	0.89	0.78	0.49	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	61	69	73	283	147	68	126	425
v/c Ratio	0.35	0.38	0.10	0.34	0.57	0.24	0.58	0.73
Control Delay	41.0	39.6	2.7	0.9	37.5	10.3	39.6	25.5
Queue Delay	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0
Total Delay	41.0	39.6	3.0	1.2	37.5	10.3	39.6	25.5
Queue Length 50th (ft)	30	33	1	0	73	0	63	184
Queue Length 95th (ft)	83	88	8	0	157	38	142	333
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	449	470	927	956	563	549	449	1104
Starvation Cap Reductn	0	0	502	293	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.15	0.17	0.43	0.26	0.12	0.28	0.38

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	258	53	178	193
v/c Ratio	0.19	0.63	0.42	0.71
Control Delay	0.9	60.5	34.6	38.6
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	1.5	60.5	34.6	38.6
Queue Length 50th (ft)	7	25	78	95
Queue Length 95th (ft)	8	#111	187	201
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1431	95	473	450
Starvation Cap Reductn	828	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.56	0.38	0.43

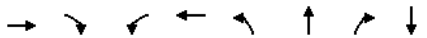
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	294	115	38	371	24	652
v/c Ratio	0.77	0.40	0.19	0.33	0.14	0.64
Control Delay	30.5	21.7	18.7	8.1	20.9	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	21.7	18.7	8.1	20.9	14.6
Queue Length 50th (ft)	58	29	11	35	7	81
Queue Length 95th (ft)	#165	67	27	157	23	#333
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	382	291	283	1109	283	1020
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.40	0.13	0.33	0.08	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	230	214	63	203	115	381
v/c Ratio	0.65	0.59	0.88	0.81	0.10	0.09	0.11	0.17
Control Delay	72.9	20.3	90.6	81.6	0.6	0.5	0.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	90.6	81.6	0.6	0.5	0.2	6.6
Queue Length 50th (ft)	45	0	163	146	1	1	0	43
Queue Length 95th (ft)	#112	56	#298	#264	1	1	0	62
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	649	2355	1092	2206
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.86	0.79	0.10	0.09	0.11	0.17

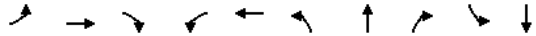
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	75	40	300	201	143	195
v/c Ratio	0.49	0.09	0.61	0.13	0.12	0.62
Control Delay	36.9	19.3	40.5	0.3	8.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	19.3	40.5	0.3	8.4	8.8
Queue Length 50th (ft)	42	3	76	2	30	0
Queue Length 95th (ft)	m79	m29	86	4	68	63
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	792	1236	1551	1208	486
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.05	0.24	0.13	0.12	0.40

Intersection Summary

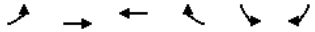
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	404	425	93	112	946	80	350
v/c Ratio	0.03	0.14	0.11	0.61	0.63	0.45	0.11	0.60	0.41	0.69
Control Delay	35.8	36.2	18.2	25.5	26.1	33.4	19.5	1.7	33.0	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.5	26.1	33.4	19.5	1.7	33.0	24.0
Queue Length 50th (ft)	2	9	0	158	169	40	20	0	34	137
Queue Length 95th (ft)	14	35	20	#375	#402	93	41	0	83	247
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	390	410	362	722	731	378	1313	1583	488	752
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.56	0.58	0.25	0.09	0.60	0.16	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	780	1140	872	151
v/c Ratio	0.38	0.22	0.58	0.79	0.86	0.26
Control Delay	39.1	4.9	17.9	14.7	35.1	4.6
Queue Delay	0.0	0.0	1.0	0.0	0.1	0.0
Total Delay	39.1	4.9	18.9	14.7	35.1	4.6
Queue Length 50th (ft)	71	31	104	637	268	0
Queue Length 95th (ft)	126	62	m181	m728	312	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2138	1339	1441	1373	724
Starvation Cap Reductn	0	0	298	0	0	0
Spillback Cap Reductn	0	1	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.75	0.79	0.65	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1033	1241	413	600	702	691
v/c Ratio	0.27	0.43	0.84	0.52	0.94	1.11	0.97
Control Delay	26.7	9.1	20.1	2.7	54.7	96.3	54.3
Queue Delay	0.0	2.2	0.6	0.1	0.0	34.4	44.0
Total Delay	26.7	11.3	20.7	2.8	54.7	130.7	98.4
Queue Length 50th (ft)	20	156	146	8	382	~508	414
Queue Length 95th (ft)	m48	144	m220	m15	#615	#757	#684
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	787	639	632	709
Starvation Cap Reductn	0	1170	0	43	0	0	0
Spillback Cap Reductn	0	68	53	0	0	43	87
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.87	0.56	0.94	1.19	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	292	1601	334	75	843	82	22	23	42	215	692
v/c Ratio	0.42	1.14	0.37	0.59	0.88	0.19	0.19	0.20	0.28	0.40	0.46
Control Delay	40.9	89.8	1.6	58.4	47.2	23.0	44.1	44.3	15.5	37.4	5.0
Queue Delay	0.0	9.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
Total Delay	40.9	98.8	1.8	58.4	47.2	23.0	44.1	44.3	15.5	38.6	5.0
Queue Length 50th (ft)	85	~652	8	47	271	30	14	14	0	108	57
Queue Length 95th (ft)	m108	m#759	m14	#95	#378	68	38	40	32	m152	m87
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	690	1407	889	142	956	442	185	186	212	538	1510
Starvation Cap Reductn	0	25	125	0	0	0	0	0	0	159	26
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.16	0.44	0.53	0.88	0.19	0.12	0.12	0.20	0.57	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	520	186
v/c Ratio	0.07	0.07	0.20	0.23	0.18
Control Delay	27.2	26.6	3.1	7.6	10.9
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.2	26.6	3.8	7.6	10.9
Queue Length 50th (ft)	14	14	0	65	55
Queue Length 95th (ft)	38	31	25	88	78
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2277	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.23	0.18

Intersection Summary

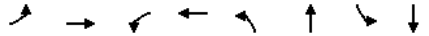
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	825	38	617	296	313	32	306	115
v/c Ratio	1.09	0.57	0.29	0.76	0.84	0.85	0.09	0.86	0.29
Control Delay	111.5	23.1	46.7	42.3	49.7	49.2	24.7	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.5	23.1	46.7	42.3	49.7	49.2	24.7	45.3	10.2
Queue Length 50th (ft)	~351	204	23	190	188	197	12	161	9
Queue Length 95th (ft)	#556	281	55	254	#297	#308	m26	#305	44
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	391	1456	159	810	407	426	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.57	0.24	0.76	0.73	0.73	0.09	0.78	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

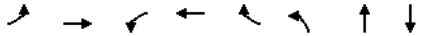
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	460	111	548	132	808	52	1042
v/c Ratio	0.87	0.68	0.64	0.73	0.65	0.46	0.41	0.67
Control Delay	99.9	34.8	52.0	37.6	46.2	18.8	45.9	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	34.8	52.0	37.6	46.2	18.8	45.9	26.6
Queue Length 50th (ft)	70	128	69	172	82	169	32	263
Queue Length 95th (ft)	#171	171	124	210	136	271	69	#455
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	891	212	1058	301	1760	230	1550
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.52	0.52	0.52	0.44	0.46	0.23	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	388	87	426	341	77	440	261
v/c Ratio	0.25	0.33	0.58	0.30	0.41	0.17	0.93	0.79
Control Delay	48.4	26.6	58.3	24.5	5.1	29.3	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.6	58.3	24.5	5.5	29.3	56.0	41.8
Queue Length 50th (ft)	16	94	53	90	0	37	265	160
Queue Length 95th (ft)	43	150	#126	175	71	75	#442	222
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1175	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.33	0.56	0.30	0.51	0.16	0.88	0.53

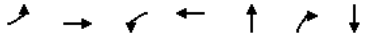
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	442	60	811	208	138	342	42	174	276
v/c Ratio	0.27	0.28	0.44	0.47	0.24	0.68	0.73	0.10	1.23	0.69
Control Delay	46.8	19.9	49.6	21.6	4.2	49.0	35.9	7.3	186.7	32.9
Queue Delay	0.0	0.0	0.0	1.5	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	19.9	49.6	23.1	4.5	49.0	35.9	7.3	186.7	32.9
Queue Length 50th (ft)	18	87	37	185	0	85	203	0	~141	125
Queue Length 95th (ft)	46	155	76	302	49	144	262	23	#276	183
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1570	165	1712	873	266	671	597	142	539
Starvation Cap Reductn	0	0	0	674	314	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.36	0.78	0.37	0.52	0.51	0.07	1.23	0.51

Intersection Summary

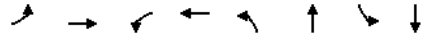
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	615	128	902	444	127	58
v/c Ratio	0.04	0.44	0.68	0.49	0.94	0.27	0.39
Control Delay	47.3	25.0	49.8	11.0	60.4	12.3	39.1
Queue Delay	0.0	0.7	0.0	0.6	0.0	0.0	0.0
Total Delay	47.3	25.7	49.8	11.6	60.4	12.3	39.1
Queue Length 50th (ft)	2	148	58	30	274	19	33
Queue Length 95th (ft)	11	237	m109	m279	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1392	208	1857	489	491	295
Starvation Cap Reductn	0	437	0	526	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.64	0.62	0.68	0.91	0.26	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	564	34	835	362	1020	175	1136
v/c Ratio	0.63	0.54	0.22	0.86	0.75	0.79	0.78	0.92
Control Delay	69.1	36.8	47.6	45.0	52.3	34.9	49.7	44.3
Queue Delay	0.0	0.0	0.0	0.1	1.7	0.0	0.0	0.1
Total Delay	69.1	36.9	47.6	45.1	54.0	34.9	49.7	44.4
Queue Length 50th (ft)	70	75	17	207	115	303	109	360
Queue Length 95th (ft)	125	236	m51	#416	#175	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1168	172	974	481	1286	301	1233
Starvation Cap Reductn	0	39	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	4	36	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.50	0.20	0.86	0.81	0.79	0.58	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	508	117	824	240	409
v/c Ratio	0.31	0.28	0.59	0.40	0.40	0.75
Control Delay	18.2	9.3	32.8	7.7	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	9.3	32.8	7.7	16.0	26.3
Queue Length 50th (ft)	23	61	33	41	25	52
Queue Length 95th (ft)	m39	m117	#86	126	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.28	0.55	0.40	0.39	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	446	63	183	5	302
v/c Ratio	0.63	0.06	0.44	0.01	0.53
Control Delay	9.9	4.4	10.2	11.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	4.4	10.2	11.0	5.4
Queue Length 50th (ft)	37	4	18	1	10
Queue Length 95th (ft)	#121	19	64	6	58
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	725	1190	646	734	846
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.05	0.28	0.01	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	565	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1350	1296
v/c Ratio	0.83	0.77	0.66	0.63
Control Delay	60.2	47.9	17.1	16.5
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	60.2	47.9	17.7	16.5
Queue Length 50th (ft)	101	147	313	292
Queue Length 95th (ft)	#170	202	395	371
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	322	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.78	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	664	1247
v/c Ratio	0.58	1.17	0.37	0.45
Control Delay	27.5	113.9	13.5	14.0
Queue Delay	0.1	0.0	3.2	0.0
Total Delay	27.6	113.9	16.7	14.1
Queue Length 50th (ft)	201	~556	118	164
Queue Length 95th (ft)	262	#793	157	198
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1304	733	1789	2792
Starvation Cap Reductn	0	0	997	0
Spillback Cap Reductn	38	0	0	204
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.17	0.84	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	701	560	708
v/c Ratio	0.71	0.46	0.88	0.30
Control Delay	25.2	15.7	45.2	5.4
Queue Delay	0.0	0.0	0.0	0.7
Total Delay	25.2	15.7	45.2	6.1
Queue Length 50th (ft)	108	105	122	53
Queue Length 95th (ft)	146	168	#206	95
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	638	2392
Starvation Cap Reductn	0	0	0	1250
Spillback Cap Reductn	47	75	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.48	0.88	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1056	156	1031	213	680	159	401	533
v/c Ratio	0.92	0.85	0.76	1.05	0.66	1.05	0.45	1.08	0.87
Control Delay	71.3	39.9	57.4	61.9	50.7	88.8	43.4	110.6	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	39.9	57.4	61.9	50.7	88.8	43.4	110.6	29.6
Queue Length 50th (ft)	219	355	107	~428	149	~270	99	~316	119
Queue Length 95th (ft)	#380	#459	m97	m337	m193	m#363	166	#506	#321
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	646	354	373	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.66	1.05	0.45	1.08	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

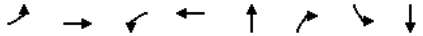
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	989	294	1439	201	1392
v/c Ratio	1.61	0.67	1.06	1.07	1.29	0.83	1.32
Control Delay	324.3	26.4	77.6	120.0	168.9	74.7	185.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.3	26.4	77.6	120.0	168.9	74.7	185.3
Queue Length 50th (ft)	~220	344	~400	~232	~683	140	~671
Queue Length 95th (ft)	m#284	m400	#533	#402	#823	#266	#811
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	132	1518	932	274	1118	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.61	0.67	1.06	1.07	1.29	0.83	1.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	89	174	639	448	241	98	503
v/c Ratio	0.59	0.47	0.25	0.82	0.92	0.41	0.60	0.70
Control Delay	53.1	50.2	7.0	9.0	60.9	7.5	65.9	34.4
Queue Delay	0.0	0.0	4.2	101.2	0.0	0.0	0.0	0.0
Total Delay	53.1	50.2	11.3	110.2	60.9	7.5	65.9	34.4
Queue Length 50th (ft)	78	63	15	16	325	7	72	300
Queue Length 95th (ft)	137	116	m12	m0	#545	72	#143	457
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	308	323	709	782	511	606	170	744
Starvation Cap Reductn	0	0	455	258	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.28	0.69	1.22	0.88	0.40	0.58	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	422	39	404	453
v/c Ratio	0.30	0.60	1.18	1.39
Control Delay	2.6	83.6	151.2	231.6
Queue Delay	0.7	0.0	1.5	49.5
Total Delay	3.3	83.6	152.6	281.1
Queue Length 50th (ft)	41	27	~371	~461
Queue Length 95th (ft)	36	#91	#600	#703
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1374	65	341	325
Starvation Cap Reductn	608	0	0	0
Spillback Cap Reductn	0	0	1	24
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.60	1.19	1.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	487	181	172	795	20	620
v/c Ratio	1.14	0.39	0.78	0.82	0.12	0.92
Control Delay	109.3	17.5	44.8	22.9	22.5	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.3	17.5	44.8	22.9	22.5	36.1
Queue Length 50th (ft)	~190	44	56	229	8	167
Queue Length 95th (ft)	#350	89	m#128	#523	m14	m#254
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	429	468	225	972	225	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.39	0.76	0.82	0.09	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

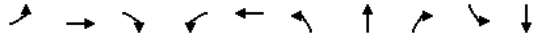
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	412	391	137	361	220	519
v/c Ratio	0.17	0.54	0.55	0.52	0.52	0.27	0.32	0.42
Control Delay	50.6	16.8	8.4	7.5	31.3	20.7	5.0	25.2
Queue Delay	0.0	0.2	0.8	0.7	0.0	0.0	0.4	0.0
Total Delay	50.6	17.0	9.2	8.2	31.3	20.7	5.4	25.2
Queue Length 50th (ft)	12	0	85	70	37	51	18	134
Queue Length 95th (ft)	35	52	129	112	m67	m77	m40	182
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	749	265	1358	693	1244
Starvation Cap Reductn	0	0	98	96	0	0	172	0
Spillback Cap Reductn	0	7	131	129	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47	0.66	0.63	0.52	0.27	0.42	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	205	36	499	693	283	304
v/c Ratio	0.74	0.05	0.64	0.48	0.30	0.79
Control Delay	30.0	0.8	38.9	1.6	19.6	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	0.8	38.9	1.6	19.6	24.0
Queue Length 50th (ft)	83	0	106	6	117	97
Queue Length 95th (ft)	171	3	110	17	220	184
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	853	1155	1437	946	537
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.04	0.43	0.48	0.30	0.57

Intersection Summary

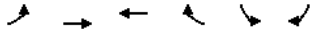


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	302	316	12	759	1434	283	669
v/c Ratio	0.59	1.20	0.22	0.81	0.84	0.13	0.90	0.91	0.86	0.81
Control Delay	46.3	153.8	28.4	42.8	44.2	47.5	46.9	10.2	48.9	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	153.8	28.4	42.8	44.2	47.5	46.9	10.2	48.9	32.7
Queue Length 50th (ft)	106	~310	23	182	192	7	241	0	166	325
Queue Length 95th (ft)	#193	#506	62	#291	#322	26	#369	#60	#294	#654
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	307	323	292	443	445	241	877	1583	388	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.20	0.22	0.68	0.71	0.05	0.87	0.91	0.73	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1314	1233	969	361
v/c Ratio	0.46	0.49	0.96	0.88	0.91	0.51
Control Delay	45.6	5.8	20.3	18.7	45.3	8.3
Queue Delay	0.0	0.0	179.9	0.0	1.6	0.0
Total Delay	45.6	5.8	200.3	18.7	46.9	8.3
Queue Length 50th (ft)	95	87	431	702	328	29
Queue Length 95th (ft)	160	134	m386	m639	#420	107
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2211	1374	1399	1124	722
Starvation Cap Reductn	0	0	442	0	0	0
Spillback Cap Reductn	0	9	0	0	56	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.49	1.41	0.88	0.91	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1196	1817	455	603	815	589
v/c Ratio	0.45	0.80	1.08	0.59	1.07	1.37	1.70
Control Delay	64.3	14.3	72.8	6.5	93.2	205.0	351.4
Queue Delay	0.0	11.3	149.5	0.3	29.9	39.6	88.9
Total Delay	64.3	25.6	222.4	6.8	123.1	244.5	440.3
Queue Length 50th (ft)	111	84	~557	39	~496	~773	~1035
Queue Length 95th (ft)	m144	102	m#395	m36	#726	#1038	#1003
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	594	346
Starvation Cap Reductn	0	181	108	58	0	0	0
Spillback Cap Reductn	0	285	403	0	37	36	36
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.99	1.42	0.64	1.14	1.46	1.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	438	1191	745	325	1274	256	72	76	66	401	759
v/c Ratio	0.82	1.17	1.05	1.19	1.20	0.51	0.34	0.35	0.25	0.81	0.62
Control Delay	55.9	113.9	48.6	151.4	134.0	33.9	49.6	49.9	25.2	47.4	9.6
Queue Delay	0.0	25.0	6.7	0.0	176.5	0.0	0.0	0.0	0.0	20.1	0.1
Total Delay	55.9	138.9	55.3	151.4	310.6	33.9	49.6	49.9	25.2	67.5	9.7
Queue Length 50th (ft)	165	~544	~268	~271	~564	149	57	61	19	274	84
Queue Length 95th (ft)	m157	m#454	m406	#470	#733	247	110	113	65	#420	120
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	502	214	217	259	493	1215
Starvation Cap Reductn	0	47	12	0	0	0	0	0	0	92	50
Spillback Cap Reductn	0	0	0	0	263	0	0	0	0	0	12
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	1.23	1.07	1.19	1.59	0.51	0.34	0.35	0.25	1.00	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1207	313
v/c Ratio	0.17	0.17	0.44	0.58	0.51
Control Delay	32.3	31.1	8.3	15.7	43.1
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	34.6	32.3	8.8	15.7	43.1
Queue Length 50th (ft)	62	65	80	264	228
Queue Length 95th (ft)	118	104	138	326	323
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1868	2069	610
Starvation Cap Reductn	351	750	576	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.64	0.58	0.51

Intersection Summary

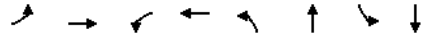
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1177	24	853	572	661	73	314	158
v/c Ratio	1.35	1.21	0.26	1.16	0.92	1.01	0.20	0.83	0.36
Control Delay	232.7	136.6	56.4	127.4	57.8	75.8	43.5	53.5	14.3
Queue Delay	0.0	0.0	0.0	0.0	11.9	38.5	0.0	0.0	0.0
Total Delay	232.7	136.6	56.4	127.4	69.7	114.3	43.5	53.5	14.3
Queue Length 50th (ft)	~207	~550	17	~376	402	~509	49	216	16
Queue Length 95th (ft)	m#352	m#682	45	#504	#693	#818	m88	301	79
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	976	97	733	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	50	62	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.21	0.25	1.16	1.00	1.12	0.15	0.60	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

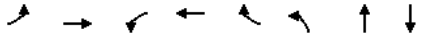


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	965	112	615	195	1592	118	1460
v/c Ratio	0.97	0.95	0.65	0.69	0.82	1.26	0.67	1.28
Control Delay	99.3	50.8	50.5	32.5	58.0	152.2	52.2	162.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	50.8	50.5	32.5	58.0	152.2	52.2	162.6
Queue Length 50th (ft)	110	277	61	156	108	~649	65	~601
Queue Length 95th (ft)	#243	#415	#118	214	#213	#786	#131	#737
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1013	197	978	256	1263	197	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.95	0.57	0.63	0.76	1.26	0.60	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	958	166	796	113	251	540	711
v/c Ratio	0.31	1.18	1.34	0.82	0.23	0.53	1.10	1.45
Control Delay	50.1	129.6	234.7	43.5	7.4	35.8	106.5	241.8
Queue Delay	0.0	67.2	19.4	2.3	0.0	0.0	0.0	1.3
Total Delay	50.1	196.9	254.1	45.8	7.4	35.8	106.5	243.1
Queue Length 50th (ft)	21	~381	~139	264	0	136	~383	~626
Queue Length 95th (ft)	51	#509	#270	#393	43	215	#590	#852
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	809	124	975	500	478	489	492
Starvation Cap Reductn	0	92	0	85	0	0	0	0
Spillback Cap Reductn	0	14	4	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.34	1.38	0.89	0.23	0.53	1.10	1.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

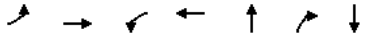
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1113	151	836	253	225	413	140	325	667
v/c Ratio	0.39	1.01	0.74	0.60	0.34	1.06	0.76	0.26	1.53	1.25
Control Delay	46.8	64.6	56.8	27.4	4.5	122.7	43.2	6.0	283.7	150.8
Queue Delay	0.0	95.9	0.0	5.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	160.4	56.8	32.7	5.0	122.7	43.2	6.0	283.7	150.8
Queue Length 50th (ft)	30	~410	93	232	0	~159	240	0	~296	~538
Queue Length 95th (ft)	64	#542	#173	314	53	#307	#377	44	m#364	m#604
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1102	230	1400	743	212	540	540	212	535
Starvation Cap Reductn	0	208	0	492	189	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.24	0.66	0.92	0.46	1.06	0.76	0.26	1.53	1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

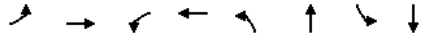
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1476	166	1148	535	302	209
v/c Ratio	0.19	1.33	0.78	0.88	1.18	0.59	0.76
Control Delay	40.1	185.9	50.2	24.6	136.2	19.4	46.7
Queue Delay	0.0	130.8	0.0	8.1	0.0	4.0	4.9
Total Delay	40.1	316.7	50.2	32.7	136.2	23.4	51.6
Queue Length 50th (ft)	19	~639	95	~413	~411	71	126
Queue Length 95th (ft)	48	#898	m53	m#281	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1108	301	1305	454	515	348
Starvation Cap Reductn	0	199	0	137	0	0	0
Spillback Cap Reductn	0	79	0	0	0	138	84
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.62	0.55	0.98	1.18	0.80	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1351	49	829	565	1431	298	1634
v/c Ratio	0.95	1.33	0.51	1.23	1.27	1.09	1.20	1.23
Control Delay	38.5	175.7	57.2	148.6	174.1	86.3	159.0	138.0
Queue Delay	2.1	22.3	0.0	6.5	0.0	1.8	0.0	21.3
Total Delay	40.6	198.1	57.2	155.1	174.1	88.1	159.0	159.3
Queue Length 50th (ft)	122	~566	32	~338	~235	~547	~232	~682
Queue Length 95th (ft)	m79	m#395	m66	m#437	#341	#685	#396	#823
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1019	106	674	446	1307	249	1333
Starvation Cap Reductn	0	37	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.38	0.46	1.24	1.27	1.10	1.20	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1059	47	807	440	485
v/c Ratio	0.25	0.53	0.26	0.41	0.66	0.86
Control Delay	20.7	11.5	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	11.5	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	163	13	43	50	52
Queue Length 95th (ft)	m17	m153	36	128	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1987	248	1957	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.53	0.19	0.41	0.64	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	567	112	349	160	780
v/c Ratio	1.10	0.13	1.09	0.21	1.02
Control Delay	93.4	13.6	110.1	12.2	57.7
Queue Delay	0.0	0.0	0.0	0.0	15.2
Total Delay	93.4	13.6	110.1	12.2	72.9
Queue Length 50th (ft)	~296	33	~209	40	~386
Queue Length 95th (ft)	#501	64	#380	79	#642
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	751	768
Starvation Cap Reductn	0	0	0	0	33
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.10	0.13	1.09	0.21	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1798	2018
v/c Ratio	1.11	0.74	0.91	1.02
Control Delay	117.3	47.0	29.4	50.2
Queue Delay	0.0	0.0	16.8	0.0
Total Delay	117.3	47.0	46.2	50.2
Queue Length 50th (ft)	~206	130	547	~772
Queue Length 95th (ft)	#315	180	#760	#927
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1976	1974
Starvation Cap Reductn	0	0	225	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.03	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1216	1944
v/c Ratio	0.62	1.58	0.78	0.63
Control Delay	30.2	292.8	17.6	12.1
Queue Delay	1.0	0.0	62.8	2.3
Total Delay	31.3	292.8	80.3	14.4
Queue Length 50th (ft)	168	~660	246	231
Queue Length 95th (ft)	227	#889	341	278
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	536	1557	3103
Starvation Cap Reductn	0	0	484	0
Spillback Cap Reductn	185	0	0	979
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	1.58	1.13	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

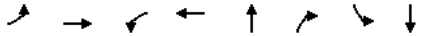
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1211	976	1052
v/c Ratio	1.14	0.97	1.01	0.44
Control Delay	113.0	54.8	71.1	9.1
Queue Delay	83.5	157.2	248.3	11.1
Total Delay	196.4	212.0	319.4	20.2
Queue Length 50th (ft)	~441	436	~360	164
Queue Length 95th (ft)	#573	#590	#500	204
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1309
Spillback Cap Reductn	128	359	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.33	1.36	1.59	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	86	64	163	351	472	261	98	666
v/c Ratio	0.53	0.37	0.24	0.48	1.31	0.41	0.60	0.85
Control Delay	51.9	43.8	4.2	1.7	191.0	7.9	63.6	41.2
Queue Delay	0.0	0.0	4.4	4.2	0.0	0.0	0.6	0.0
Total Delay	51.9	43.8	8.5	6.0	191.0	7.9	64.2	41.2
Queue Length 50th (ft)	62	38	2	0	~462	12	71	441
Queue Length 95th (ft)	115	82	m14	m0	#699	81	#140	#710
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	319	332	677	733	361	638	175	795
Starvation Cap Reductn	0	0	437	298	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	2	8	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.19	0.68	0.81	1.31	0.41	0.59	0.84

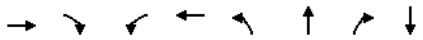
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	408	47	271	262
v/c Ratio	0.29	0.78	0.85	0.88
Control Delay	2.6	96.0	61.3	67.3
Queue Delay	0.7	0.0	0.0	0.0
Total Delay	3.3	96.0	61.3	67.3
Queue Length 50th (ft)	41	33	195	190
Queue Length 95th (ft)	36	#108	#345	#354
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1418	67	352	319
Starvation Cap Reductn	655	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	0.70	0.77	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	575	537	155	322	395	528
v/c Ratio	0.14	0.34	0.97	0.92	0.80	0.29	0.53	0.52
Control Delay	35.6	15.7	49.5	39.6	45.3	16.6	3.2	32.0
Queue Delay	0.0	0.4	93.0	69.6	0.0	0.0	1.9	0.1
Total Delay	35.6	16.1	142.5	109.1	45.3	16.6	5.0	32.2
Queue Length 50th (ft)	33	27	405	373	37	40	9	155
Queue Length 95th (ft)	69	84	#674	#610	m#170	m57	m17	210
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	430	596	589	193	1121	741	1025
Starvation Cap Reductn	0	0	92	85	0	0	202	0
Spillback Cap Reductn	15	69	126	124	0	0	18	70
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.41	1.22	1.15	0.80	0.29	0.73	0.55

Intersection Summary

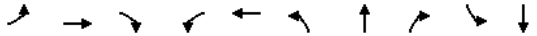
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	355	73	751	938	391	378
v/c Ratio	0.89	0.09	0.85	0.72	0.51	0.35
Control Delay	32.0	1.2	22.5	24.3	30.3	8.1
Queue Delay	0.5	0.0	0.4	2.5	0.0	0.0
Total Delay	32.4	1.2	22.9	26.7	30.3	8.1
Queue Length 50th (ft)	227	5	220	697	208	87
Queue Length 95th (ft)	327	m8	m257	m786	358	162
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	982	1186	1309	762	1168
Starvation Cap Reductn	18	0	0	244	0	0
Spillback Cap Reductn	0	0	126	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.07	0.71	0.88	0.51	0.32

Intersection Summary

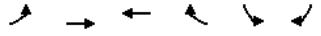
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	459	445	45	357	1252	147	545
v/c Ratio	0.22	0.17	0.07	0.77	0.75	0.32	0.34	0.79	0.63	0.79
Control Delay	35.9	35.6	20.7	34.8	33.1	35.7	23.5	4.1	33.3	31.7
Queue Delay	0.0	0.0	0.0	2.8	2.1	0.0	0.0	0.0	0.0	1.7
Total Delay	35.9	35.6	20.7	37.6	35.3	35.7	23.5	4.1	33.3	33.5
Queue Length 50th (ft)	13	11	0	220	209	21	73	0	69	247
Queue Length 95th (ft)	39	34	13	#429	#412	54	124	0	126	#471
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	596	306	1136	1583	431	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	20	62	62	0	0	0	0	69
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.86	0.83	0.15	0.31	0.79	0.34	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	849	1146	1124	282
v/c Ratio	0.68	0.19	0.62	0.82	0.88	0.38
Control Delay	51.4	13.3	20.4	20.9	34.2	4.4
Queue Delay	0.0	0.0	11.7	0.0	116.6	0.0
Total Delay	51.4	13.3	32.1	20.9	150.8	4.4
Queue Length 50th (ft)	87	62	263	638	377	12
Queue Length 95th (ft)	143	107	m313	m758	398	57
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1937	1365	1399	1592	871
Starvation Cap Reductn	0	0	497	0	293	0
Spillback Cap Reductn	0	2	0	0	696	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.19	0.98	0.82	1.25	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1325	1532	504	464	779	756
v/c Ratio	0.77	1.11	0.93	0.60	0.63	0.98	1.93
Control Delay	69.2	82.7	43.8	7.1	28.9	48.1	450.3
Queue Delay	0.0	138.6	28.9	0.2	0.4	526.7	252.1
Total Delay	69.2	221.3	72.7	7.3	29.3	574.7	702.4
Queue Length 50th (ft)	77	~403	398	28	262	426	~938
Queue Length 95th (ft)	m127	#500	#543	m101	382	#745	#1340
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	844	734	794	391
Starvation Cap Reductn	0	264	92	51	0	0	0
Spillback Cap Reductn	0	45	209	0	51	439	248
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.42	1.06	0.64	0.68	2.19	5.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	479	1538	827	380	816	270	153	161	110	576	966
v/c Ratio	0.81	1.46	1.36	1.39	0.77	0.52	0.84	0.86	0.42	1.16	0.75
Control Delay	51.3	233.4	184.3	231.4	40.8	24.3	91.5	93.8	26.5	118.2	12.2
Queue Delay	389.5	290.5	47.8	0.0	0.8	0.0	0.0	0.0	0.0	99.4	7.9
Total Delay	440.8	523.9	232.1	231.4	41.6	24.3	91.5	93.8	26.5	217.6	20.0
Queue Length 50th (ft)	163	~792	~684	~358	275	101	121	127	25	~471	93
Queue Length 95th (ft)	m136	m#580	m#510	#545	350	185	m#235	m#249	m69	m#587	m218
Internal Link Dist (ft)		92			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	606	274	1062	523	183	188	261	496	1293
Starvation Cap Reductn	336	325	44	0	0	0	0	0	0	81	290
Spillback Cap Reductn	0	0	0	0	73	0	0	0	0	0	137
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.86	2.10	1.47	1.39	0.83	0.52	0.84	0.86	0.42	1.39	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1690	457
v/c Ratio	0.22	0.22	0.83	0.91	0.53
Control Delay	23.5	23.1	28.4	19.8	14.8
Queue Delay	1.2	0.7	2.2	0.5	0.0
Total Delay	24.7	23.8	30.7	20.3	14.8
Queue Length 50th (ft)	79	82	312	602	283
Queue Length 95th (ft)	127	114	370	#151	106
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	58	122	0	30	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.92	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1133	43	849	320	337	40	308	107
v/c Ratio	1.00	1.03	0.41	0.97	0.81	0.81	0.10	0.76	0.25
Control Delay	126.5	61.9	43.3	51.4	37.3	36.5	21.2	33.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	61.9	43.3	51.4	37.3	36.5	21.2	33.4	6.7
Queue Length 50th (ft)	~52	~302	18	~192	125	130	13	118	0
Queue Length 95th (ft)	#142	#422	#51	#312	#243	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	110	1098	104	876	428	449	425	448	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.03	0.41	0.97	0.75	0.75	0.09	0.69	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1574	190	1458	469	238	79
v/c Ratio	0.34	1.18	1.19	0.85	1.06	0.48	0.31
Control Delay	58.4	113.5	129.3	22.0	97.0	16.0	30.5
Queue Delay	0.0	151.4	0.0	102.5	0.0	0.1	0.0
Total Delay	58.4	264.9	129.3	124.5	97.0	16.1	30.5
Queue Length 50th (ft)	11	~593	~144	335	~330	45	42
Queue Length 95th (ft)	m28	#928	m#113	m#494	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1335	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	524	0	0	0
Spillback Cap Reductn	0	298	0	0	0	13	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.52	1.19	1.23	1.06	0.49	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1351	78	841	668	1232	170	1504
v/c Ratio	0.90	1.22	0.76	1.03	1.22	1.00	0.80	1.43
Control Delay	60.8	117.4	84.2	76.4	150.7	59.5	59.7	226.9
Queue Delay	0.0	35.2	0.0	53.9	358.6	0.0	0.0	1.2
Total Delay	60.8	152.6	84.2	130.4	509.3	59.5	59.7	228.1
Queue Length 50th (ft)	114	~544	50	~307	~270	~451	105	~687
Queue Length 95th (ft)	m137	m#430	#128	#431	#382	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1104	106	819	549	1232	239	1054
Starvation Cap Reductn	0	67	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	96	218	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.30	0.74	1.16	2.02	1.00	0.71	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #2
BASE YEAR

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1178	111	692	92	231	64	198	202
v/c Ratio	0.97	0.67	0.65	0.67	0.50	0.62	0.25	0.74	0.50
Control Delay	68.2	22.5	47.5	55.1	50.0	44.8	42.2	53.2	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	22.5	47.5	55.1	50.0	44.8	42.2	53.2	9.2
Queue Length 50th (ft)	375	307	77	271	62	75	40	135	0
Queue Length 95th (ft)	#596	433	m140	#352	112	113	79	209	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1761	193	1030	257	519	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.67	0.58	0.67	0.36	0.45	0.21	0.61	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	723	141	576	123	791
v/c Ratio	0.47	0.78	0.82	0.67	0.38	0.48	0.49
Control Delay	19.0	20.5	35.1	54.1	22.9	50.1	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	20.5	35.1	54.1	22.9	50.1	23.5
Queue Length 50th (ft)	17	156	238	96	140	81	198
Queue Length 95th (ft)	m25	107	282	160	210	141	300
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	226	1522	1228	257	1519	257	1598
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.57	0.59	0.55	0.38	0.48	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	248	98	39	309	25	460
v/c Ratio	0.59	0.33	0.20	0.28	0.14	0.45
Control Delay	16.2	20.2	18.7	8.0	21.0	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	20.2	18.7	8.0	21.0	9.9
Queue Length 50th (ft)	32	24	11	28	7	50
Queue Length 95th (ft)	#90	57	31	131	24	172
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	419	295	283	1109	283	1023
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.33	0.14	0.28	0.09	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	303	302	314	315
v/c Ratio	0.19	0.19	0.35	0.21
Control Delay	9.5	2.3	4.5	16.6
Queue Delay	0.0	0.0	2.8	0.0
Total Delay	9.5	2.3	7.2	16.6
Queue Length 50th (ft)	17	3	0	61
Queue Length 95th (ft)	50	m2	m0	89
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1575	1628	898	1514
Starvation Cap Reductn	0	0	462	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.19	0.72	0.21

Intersection Summary

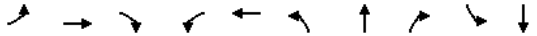
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	267	16	242	171	71	112
v/c Ratio	0.81	0.03	0.63	0.12	0.07	0.29
Control Delay	54.1	25.7	30.7	1.1	11.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	25.7	30.7	1.1	11.0	8.2
Queue Length 50th (ft)	183	4	35	4	20	0
Queue Length 95th (ft)	#276	m26	47	5	44	44
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	922	1236	1368	1084	421
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.02	0.20	0.13	0.07	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

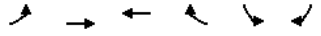
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	344	362	96	39	659	65	315
v/c Ratio	0.03	0.12	0.10	0.62	0.64	0.41	0.04	0.42	0.31	0.59
Control Delay	35.2	35.4	18.2	23.4	23.8	31.7	18.6	0.8	32.3	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	35.4	18.2	23.4	23.8	31.7	18.6	0.8	32.3	21.5
Queue Length 50th (ft)	2	9	0	118	126	35	5	0	24	103
Queue Length 95th (ft)	14	36	20	#281	#317	95	18	0	71	219
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	443	466	409	741	751	431	1494	1583	544	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.46	0.48	0.22	0.03	0.42	0.12	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	785	721	139
v/c Ratio	0.38	0.19	0.49	0.54	0.84	0.28
Control Delay	39.3	3.9	18.9	3.8	36.6	5.3
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	39.3	3.9	19.2	3.8	36.6	5.3
Queue Length 50th (ft)	72	24	117	218	226	0
Queue Length 95th (ft)	129	52	m160	m250	267	42
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2274	1493	1441	1373	717
Starvation Cap Reductn	0	0	298	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.62	0.54	0.53	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	876	884	316	556	666	654
v/c Ratio	0.25	0.37	0.60	0.44	0.87	1.02	0.90
Control Delay	20.6	9.7	15.1	2.4	45.0	65.5	39.4
Queue Delay	0.0	1.3	0.1	0.0	0.0	1.4	0.1
Total Delay	20.6	11.0	15.2	2.4	45.0	66.9	39.5
Queue Length 50th (ft)	14	151	87	2	340	~405	349
Queue Length 95th (ft)	43	138	118	5	#548	#668	#598
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	721	639	653	727
Starvation Cap Reductn	0	1230	0	0	0	0	0
Spillback Cap Reductn	0	109	45	0	0	3	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.61	0.44	0.87	1.02	0.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	562	1201	347	49	647	117	24	25	46	126	522
v/c Ratio	0.82	0.85	0.38	0.38	0.68	0.26	0.21	0.21	0.30	0.23	0.34
Control Delay	51.3	21.8	1.4	38.5	25.7	13.4	44.5	44.6	15.3	31.1	6.8
Queue Delay	0.4	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	23.8	1.6	38.5	25.7	13.4	44.5	44.6	15.3	31.1	6.8
Queue Length 50th (ft)	189	272	8	29	110	21	15	15	0	72	0
Queue Length 95th (ft)	m#253	m#504	m14	m47	141	m45	41	42	34	114	62
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	689	1405	912	142	956	454	185	186	215	542	1517
Starvation Cap Reductn	0	99	127	0	0	0	0	0	0	0	86
Spillback Cap Reductn	12	0	0	0	0	3	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.92	0.44	0.35	0.68	0.26	0.13	0.13	0.21	0.23	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	382	92
v/c Ratio	0.03	0.03	0.14	0.08	0.22	0.25	0.14
Control Delay	19.4	19.0	2.4	45.0	19.4	18.0	34.6
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.0	34.6
Queue Length 50th (ft)	8	9	0	4	0	77	55
Queue Length 95th (ft)	26	22	21	19	24	110	97
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1553	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.25	0.14

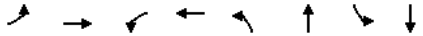
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	606	37	503	250	216	28	153	101
v/c Ratio	0.73	0.35	0.28	0.62	0.79	0.65	0.12	0.63	0.34
Control Delay	27.9	11.0	46.6	37.4	44.3	39.3	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	11.0	46.6	37.4	44.3	39.3	31.3	38.9	9.9
Queue Length 50th (ft)	237	118	22	147	156	127	16	95	0
Queue Length 95th (ft)	m#428	m221	54	203	237	200	29	100	39
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	531	1714	159	810	409	428	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.35	0.23	0.62	0.61	0.50	0.08	0.39	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

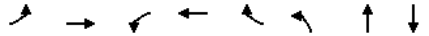
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	284	97	438	112	548	53	702
v/c Ratio	0.63	0.50	0.59	0.72	0.61	0.28	0.41	0.39
Control Delay	65.8	27.4	50.0	39.3	45.6	13.5	45.9	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	27.4	50.0	39.3	45.6	13.5	45.9	17.2
Queue Length 50th (ft)	47	60	60	138	69	95	33	141
Queue Length 95th (ft)	#108	98	111	181	120	153	70	223
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	907	212	1058	301	1967	230	1807
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.31	0.46	0.41	0.37	0.28	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

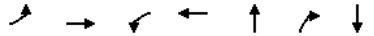


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	220	47	321	66	51	91	38
v/c Ratio	0.25	0.11	0.38	0.15	0.07	0.29	0.46	0.16
Control Delay	48.0	11.4	50.1	11.3	4.6	42.5	31.3	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	11.4	50.1	11.3	4.6	42.5	31.3	28.6
Queue Length 50th (ft)	16	27	29	32	0	31	38	17
Queue Length 95th (ft)	42	71	64	105	26	67	87	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1998	140	2145	986	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.11	0.34	0.15	0.07	0.11	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	206	55	404	179	127	246	42	59	143
v/c Ratio	0.28	0.12	0.42	0.22	0.20	0.65	0.59	0.13	0.48	0.42
Control Delay	46.9	15.7	48.9	17.0	4.2	48.0	34.6	9.0	56.4	32.0
Queue Delay	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.7	48.9	17.5	4.7	48.0	34.6	9.0	56.4	32.0
Queue Length 50th (ft)	19	27	34	66	0	79	153	0	38	86
Queue Length 95th (ft)	47	70	71	142	46	134	185	25	81	93
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1694	164	1838	908	266	671	489	142	536
Starvation Cap Reductn	0	0	0	957	400	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.12	0.34	0.46	0.35	0.48	0.37	0.09	0.42	0.27

Intersection Summary

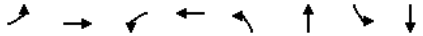


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	294	75	576	164	120	37
v/c Ratio	0.04	0.16	0.53	0.27	0.87	0.28	0.26
Control Delay	47.3	17.7	50.1	8.1	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.7	50.1	8.3	52.9	6.6	37.5
Queue Length 50th (ft)	2	53	43	22	99	0	21
Queue Length 95th (ft)	11	113	m89	186	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1802	195	2098	237	515	323
Starvation Cap Reductn	0	0	0	699	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.16	0.38	0.41	0.69	0.23	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	299	32	476	259	785	147	795
v/c Ratio	0.62	0.51	0.18	0.80	0.54	0.45	0.73	0.48
Control Delay	59.7	40.6	46.8	43.9	44.6	20.4	47.6	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	40.6	46.8	43.9	44.6	20.4	47.6	21.3
Queue Length 50th (ft)	44	42	17	108	80	182	92	193
Queue Length 95th (ft)	122	135	m49	187	121	290	149	279
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1022	193	761	481	1749	301	1646
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.29	0.17	0.63	0.54	0.45	0.49	0.48

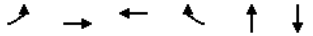
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	330	7	479	145	318
v/c Ratio	0.27	0.15	0.05	0.23	0.27	0.60
Control Delay	12.0	5.9	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	5.9	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	46	2	20	16	36
Queue Length 95th (ft)	m22	86	11	67	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2247	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.23	0.24	0.55

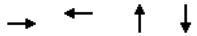
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1020	850
v/c Ratio	0.57	0.58	0.44	0.37
Control Delay	46.2	43.7	9.8	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.8	8.9
Queue Length 50th (ft)	58	76	154	118
Queue Length 95th (ft)	92	112	237	186
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.44	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	484	747
v/c Ratio	0.35	0.96	0.24	0.24
Control Delay	25.8	30.3	10.7	10.4
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	25.8	30.3	11.4	10.4
Queue Length 50th (ft)	92	235	81	86
Queue Length 95th (ft)	130	#486	111	110
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1298	813	1979	3054
Starvation Cap Reductn	0	0	1092	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.89	0.55	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	523	240	530
v/c Ratio	0.51	0.27	0.48	0.20
Control Delay	22.3	8.9	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	8.9	28.9	3.2
Queue Length 50th (ft)	41	53	50	24
Queue Length 95th (ft)	71	96	78	44
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1951	638	2689
Starvation Cap Reductn	0	0	0	1602
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.38	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	810	114	867	188	565	141	276	501
v/c Ratio	0.87	0.59	0.62	0.79	0.60	0.90	0.44	0.83	0.83
Control Delay	61.6	28.8	69.1	28.8	48.2	55.6	43.2	56.0	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	28.8	69.1	28.8	48.2	55.6	43.2	56.0	21.1
Queue Length 50th (ft)	194	237	77	280	130	204	88	185	73
Queue Length 95th (ft)	#330	316	m120	#433	m188	m#286	149	#299	#248
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1374	225	1102	322	646	354	373	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.59	0.51	0.79	0.58	0.87	0.40	0.74	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	839	187	1061	197	969
v/c Ratio	0.79	0.73	0.83	0.76	0.69	0.82	0.63
Control Delay	45.5	33.7	34.6	58.7	29.5	72.7	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	33.7	34.6	58.7	29.5	72.7	28.6
Queue Length 50th (ft)	78	310	291	126	289	137	263
Queue Length 95th (ft)	m118	m333	290	#217	#520	#258	#470
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	181	1518	1391	274	1543	241	1527
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.53	0.60	0.68	0.69	0.82	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	390	156	177	699	21	475
v/c Ratio	0.88	0.33	0.80	0.72	0.12	0.71
Control Delay	42.2	16.2	45.7	18.2	22.8	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	16.2	45.7	18.2	22.8	20.4
Queue Length 50th (ft)	114	36	58	191	8	108
Queue Length 95th (ft)	#257	77	m#127	#444	m16	165
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	445	470	225	975	225	670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.33	0.79	0.72	0.09	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

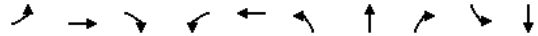
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	852	420	182	501
v/c Ratio	0.53	0.26	0.23	0.34
Control Delay	13.1	2.9	0.5	20.2
Queue Delay	2.4	0.4	0.7	0.0
Total Delay	15.5	3.3	1.2	20.2
Queue Length 50th (ft)	229	11	0	116
Queue Length 95th (ft)	191	m11	m0	157
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1612	1609	776	1475
Starvation Cap Reductn	603	701	337	0
Spillback Cap Reductn	120	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.46	0.41	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	163	37	513	659	214	339
v/c Ratio	0.67	0.05	0.59	0.45	0.23	0.80
Control Delay	24.9	0.3	29.0	2.1	19.2	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	0.3	29.0	2.1	19.2	17.6
Queue Length 50th (ft)	47	0	79	17	84	67
Queue Length 95th (ft)	65	1	67	13	167	164
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	826	1155	1471	934	593
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	14	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.04	0.45	0.45	0.23	0.57

Intersection Summary

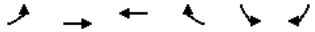


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	231	244	12	697	1282	274	614
v/c Ratio	0.56	1.15	0.21	0.71	0.74	0.12	0.83	0.81	0.83	0.74
Control Delay	42.8	130.8	27.4	37.1	37.7	46.3	38.4	4.6	43.6	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	130.8	27.4	37.1	37.7	46.3	38.4	4.6	43.6	27.4
Queue Length 50th (ft)	99	~287	21	129	137	7	193	0	147	249
Queue Length 95th (ft)	#202	#524	64	215	228	26	#322	0	#281	#573
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	333	350	314	456	459	257	926	1583	411	834
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.15	0.21	0.51	0.53	0.05	0.75	0.81	0.67	0.74

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1177	1119	776	359
v/c Ratio	0.47	0.45	0.80	0.80	0.84	0.52
Control Delay	45.8	4.5	13.5	15.0	41.1	5.2
Queue Delay	0.0	0.0	130.7	0.0	0.2	0.0
Total Delay	45.8	4.5	144.2	15.0	41.2	5.2
Queue Length 50th (ft)	97	61	343	615	265	0
Queue Length 95th (ft)	163	117	m352	m586	312	64
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2328	1476	1399	1124	760
Starvation Cap Reductn	0	0	562	0	0	0
Spillback Cap Reductn	0	6	0	0	35	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.45	1.29	0.80	0.71	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1051	1699	499	598	724	479
v/c Ratio	0.45	0.71	1.01	0.66	1.06	1.25	1.35
Control Delay	65.6	12.6	52.2	10.1	90.5	157.5	201.4
Queue Delay	0.0	1.5	106.2	0.4	8.6	1.9	1.7
Total Delay	65.6	14.1	158.4	10.5	99.1	159.4	203.1
Queue Length 50th (ft)	110	66	~401	60	~488	~656	~737
Queue Length 95th (ft)	m167	100	m#541	m73	#716	#910	#1088
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	753	565	577	354
Starvation Cap Reductn	0	248	116	49	0	0	0
Spillback Cap Reductn	0	83	341	0	12	2	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.85	1.26	0.71	1.08	1.26	1.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	447	925	636	282	1075	177	78	82	72	401	854
v/c Ratio	0.84	0.92	0.90	1.03	1.01	0.36	0.36	0.38	0.27	0.81	0.71
Control Delay	60.5	40.4	21.7	108.6	69.5	26.9	50.2	50.5	24.8	37.4	6.0
Queue Delay	0.0	3.4	1.0	0.0	116.7	0.0	0.0	0.0	0.0	15.7	0.1
Total Delay	60.5	43.8	22.6	108.6	186.2	26.9	50.2	50.5	24.8	53.1	6.1
Queue Length 50th (ft)	168	272	277	~214	~408	79	63	66	20	204	24
Queue Length 95th (ft)	m177	m297	m331	#382	#554	141	116	121	68	#409	43
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	497	214	217	264	494	1208
Starvation Cap Reductn	0	40	11	0	0	0	0	0	0	85	30
Spillback Cap Reductn	0	0	0	0	231	0	0	0	0	0	9
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.96	0.92	1.03	1.29	0.36	0.36	0.38	0.27	0.98	0.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1013	251
v/c Ratio	0.13	0.12	0.45	0.42	0.51	0.63	0.38
Control Delay	30.3	29.2	5.8	50.5	12.6	25.1	41.2
Queue Delay	1.3	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	31.6	29.2	6.5	50.5	12.6	25.1	41.2
Queue Length 50th (ft)	51	50	1	35	0	280	181
Queue Length 95th (ft)	102	82	131	73	52	350	261
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1734	241	307	1603	668
Starvation Cap Reductn	377	0	577	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.67	0.21	0.34	0.63	0.38

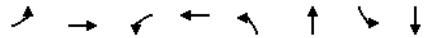
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	896	22	669	518	484	63	215	170
v/c Ratio	1.10	0.85	0.24	0.91	0.71	0.64	0.25	0.82	0.47
Control Delay	147.0	45.5	55.7	60.4	34.4	31.4	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	4.7	2.9	0.0	0.0	0.0
Total Delay	147.0	45.5	55.7	60.4	39.1	34.2	43.8	49.2	12.1
Queue Length 50th (ft)	~153	290	15	242	276	248	39	134	3
Queue Length 95th (ft)	#295	#487	42	#351	#516	457	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	167	1052	97	732	726	757	499	525	556
Starvation Cap Reductn	0	0	0	0	143	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.85	0.23	0.91	0.89	0.83	0.13	0.41	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

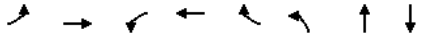


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	830	109	463	152	1189	122	1053
v/c Ratio	0.76	0.86	0.64	0.54	0.71	0.91	0.69	0.85
Control Delay	59.5	38.7	49.9	29.2	47.6	40.3	53.4	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	38.7	49.9	29.2	47.6	40.3	53.4	37.4
Queue Length 50th (ft)	78	221	60	110	83	~386	67	307
Queue Length 95th (ft)	#165	#320	113	156	145	#520	#137	#467
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	981	197	978	256	1310	197	1236
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.85	0.55	0.47	0.59	0.91	0.62	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	831	87	640	29	198	232	182
v/c Ratio	0.25	0.53	0.57	0.35	0.04	0.69	0.74	0.65
Control Delay	48.1	24.1	57.5	19.2	9.7	41.0	33.2	39.3
Queue Delay	0.0	1.2	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	48.1	25.3	57.5	19.8	9.7	41.0	33.2	39.3
Queue Length 50th (ft)	16	183	53	97	0	123	114	109
Queue Length 95th (ft)	42	#413	#120	268	23	171	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1578	158	1843	803	478	492	492
Starvation Cap Reductn	0	489	0	789	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.76	0.55	0.61	0.04	0.41	0.47	0.37

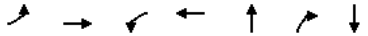
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	717	153	541	166	197	297	125	179	388
v/c Ratio	0.39	0.56	0.74	0.36	0.23	0.93	0.67	0.27	0.87	0.90
Control Delay	46.8	27.8	56.6	22.2	4.7	91.1	37.9	6.2	74.2	42.8
Queue Delay	0.0	1.1	0.0	0.8	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.9	56.6	23.0	5.0	91.1	37.9	6.2	74.2	42.8
Queue Length 50th (ft)	31	188	94	124	0	126	171	0	116	239
Queue Length 95th (ft)	67	268	#177	192	45	#261	245	42	#233	290
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1279	233	1522	736	212	540	530	212	531
Starvation Cap Reductn	0	320	0	641	243	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.66	0.61	0.34	0.93	0.55	0.24	0.84	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

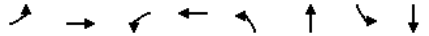


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	932	135	829	328	255	191
v/c Ratio	0.18	0.71	0.70	0.57	0.86	0.50	0.71
Control Delay	40.0	33.1	52.4	18.1	47.6	8.6	45.0
Queue Delay	0.0	10.9	0.0	0.3	0.0	0.0	0.0
Total Delay	40.0	44.0	52.4	18.5	47.6	8.6	45.0
Queue Length 50th (ft)	19	261	90	105	201	12	115
Queue Length 95th (ft)	47	#475	m56	m#284	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1304	301	1453	452	562	348
Starvation Cap Reductn	0	353	0	190	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.98	0.45	0.66	0.73	0.45	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	887	50	577	440	1051	241	1163
v/c Ratio	0.91	0.91	0.51	0.91	0.99	0.78	0.95	0.84
Control Delay	55.7	36.0	61.1	46.6	84.0	32.4	90.0	34.7
Queue Delay	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	55.7	38.3	61.1	46.6	84.0	32.4	90.0	35.5
Queue Length 50th (ft)	143	74	33	177	146	311	155	353
Queue Length 95th (ft)	m#242	#350	m71	#238	#246	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	254	980	107	680	446	1351	253	1378
Starvation Cap Reductn	0	36	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.94	0.47	0.85	0.99	0.78	0.95	0.88

Intersection Summary

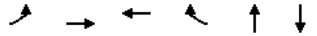
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	719	10	583	276	377
v/c Ratio	0.10	0.32	0.07	0.27	0.49	0.66
Control Delay	20.6	6.4	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	6.4	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	94	3	26	35	36
Queue Length 95th (ft)	m7	m112	14	79	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2219	248	2175	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.32	0.04	0.27	0.43	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1276	1424
v/c Ratio	0.69	0.63	0.59	0.66
Control Delay	46.8	43.3	14.3	15.7
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.7	15.7
Queue Length 50th (ft)	90	88	250	300
Queue Length 95th (ft)	131	127	372	443
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2171	2165
Starvation Cap Reductn	0	0	395	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.72	0.66

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	905	1327
v/c Ratio	0.31	1.01	0.47	0.43
Control Delay	25.4	65.3	10.5	9.7
Queue Delay	0.1	0.0	4.9	0.1
Total Delay	25.5	65.3	15.4	9.8
Queue Length 50th (ft)	75	~273	134	131
Queue Length 95th (ft)	111	#497	177	161
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	589	1945	3103
Starvation Cap Reductn	0	0	956	0
Spillback Cap Reductn	148	0	0	562
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.01	0.92	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	933	643	771
v/c Ratio	0.82	0.60	0.82	0.31
Control Delay	44.3	26.2	43.5	6.6
Queue Delay	0.3	0.7	12.7	1.8
Total Delay	44.6	27.0	56.2	8.5
Queue Length 50th (ft)	216	254	223	94
Queue Length 95th (ft)	272	376	270	138
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1530
Spillback Cap Reductn	33	310	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.74	0.97	0.78

Intersection Summary

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	937	361	346	431
v/c Ratio	0.54	0.24	0.42	0.32
Control Delay	7.9	12.7	7.0	22.3
Queue Delay	1.7	0.0	2.7	0.0
Total Delay	9.6	12.7	9.7	22.3
Queue Length 50th (ft)	38	85	164	105
Queue Length 95th (ft)	48	m90	m209	144
Internal Link Dist (ft)	342	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1730	1480	825	1350
Starvation Cap Reductn	588	0	356	0
Spillback Cap Reductn	181	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.24	0.74	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

1010: Shellmound Way & Shellmound St

Existing Plus Alt#2 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	301	55	717	864	245	237
v/c Ratio	0.80	0.06	0.74	0.65	0.33	0.23
Control Delay	19.4	0.1	15.6	14.6	27.0	6.4
Queue Delay	0.1	0.0	0.0	1.3	0.0	0.0
Total Delay	19.5	0.1	15.6	16.0	27.0	6.4
Queue Length 50th (ft)	64	1	144	598	122	45
Queue Length 95th (ft)	76	0	m223	725	218	88
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	963	1186	1329	738	1150
Starvation Cap Reductn	8	0	0	260	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.06	0.60	0.81	0.33	0.21

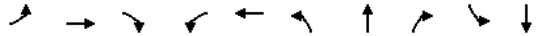
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#2 SAT



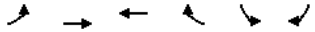
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	398	386	45	267	909	130	461
v/c Ratio	0.18	0.14	0.06	0.69	0.67	0.27	0.28	0.57	0.53	0.72
Control Delay	35.7	35.5	20.7	27.1	26.4	34.9	22.1	1.5	31.9	25.2
Queue Delay	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.1
Total Delay	35.7	35.5	20.7	27.5	26.7	34.9	22.1	1.5	31.9	25.3
Queue Length 50th (ft)	13	11	0	181	172	21	52	0	61	195
Queue Length 95th (ft)	39	34	13	#349	#331	54	93	0	115	#366
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	383	403	349	673	674	366	1248	1583	505	794
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	4	47	47	0	0	0	0	22
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.02	0.64	0.62	0.12	0.21	0.57	0.26	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

Existing Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	609	886	938	263
v/c Ratio	0.68	0.14	0.40	0.63	0.88	0.39
Control Delay	51.4	10.0	14.1	11.3	36.9	3.8
Queue Delay	0.0	0.0	1.4	0.0	3.7	0.0
Total Delay	51.4	10.0	15.5	11.3	40.6	3.8
Queue Length 50th (ft)	85	42	140	362	324	0
Queue Length 95th (ft)	141	76	222	561	355	51
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2178	1526	1399	1592	875
Starvation Cap Reductn	0	0	676	0	158	0
Spillback Cap Reductn	0	105	0	0	548	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.14	0.72	0.63	0.90	0.30

Intersection Summary

Queues
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1114	1090	451	404	573	550
v/c Ratio	0.74	0.93	0.65	0.55	0.55	0.72	1.40
Control Delay	66.2	35.2	30.9	7.9	26.5	17.7	216.4
Queue Delay	0.0	118.6	0.2	0.2	0.1	0.0	0.0
Total Delay	66.2	153.8	31.1	8.1	26.6	17.7	216.4
Queue Length 50th (ft)	66	305	261	83	217	176	~881
Queue Length 95th (ft)	128	#366	324	m132	320	334	#774
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1681	815	734	798	394
Starvation Cap Reductn	0	319	126	46	0	0	0
Spillback Cap Reductn	0	0	30	0	14	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.27	0.70	0.59	0.56	0.72	1.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave

Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	485	1109	620	293	480	160	153	161	110	446	801
v/c Ratio	0.82	0.95	1.01	1.07	0.45	0.31	0.84	0.86	0.42	0.89	0.60
Control Delay	58.8	31.7	36.9	119.0	32.9	14.4	91.5	93.8	26.5	45.8	17.8
Queue Delay	0.2	1.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0	34.5	0.4
Total Delay	59.0	33.7	38.2	119.0	32.9	14.5	91.5	93.8	26.5	80.3	18.3
Queue Length 50th (ft)	176	233	~201	~230	144	33	121	127	25	282	90
Queue Length 95th (ft)	m185	m248	m#388	#401	193	87	m#235	m#249	m69	#483	126
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1169	616	274	1062	524	183	188	261	499	1344
Starvation Cap Reductn	0	21	3	0	0	0	0	0	0	79	178
Spillback Cap Reductn	4	0	0	0	0	18	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.97	1.01	1.07	0.45	0.32	0.84	0.86	0.42	1.06	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St

Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1360	302
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.83	0.46
Control Delay	31.1	30.2	32.8	50.5	12.1	22.3	33.1
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.0	0.0
Total Delay	32.4	30.9	34.8	50.5	12.6	22.3	33.1
Queue Length 50th (ft)	64	67	253	38	0	488	199
Queue Length 95th (ft)	135	117	381	78	57	588	307
Internal Link Dist (ft)		150				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1637	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	11	0	0	0	37	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.45	0.83	0.46

Intersection Summary

Queues
1016: Powell St & Hollis Street

Existing Plus Alt#2 SAT

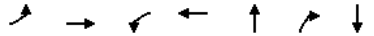
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	663	40	660	197	187	38	190	97
v/c Ratio	0.59	0.41	0.35	0.47	0.59	0.53	0.12	0.56	0.27
Control Delay	52.3	16.4	38.4	20.9	24.7	22.8	20.8	24.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	16.4	38.4	20.9	24.7	22.8	20.8	24.2	6.8
Queue Length 50th (ft)	26	75	14	107	64	56	11	61	0
Queue Length 95th (ft)	#93	#185	44	#211	129	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	122	1602	115	1443	445	465	443	466	461
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.41	0.35	0.46	0.44	0.40	0.09	0.41	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

Existing Plus Alt#2 SAT



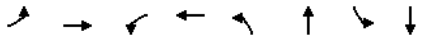
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1004	165	1024	204	197	59
v/c Ratio	0.32	0.61	1.04	0.50	0.72	0.48	0.24
Control Delay	62.5	13.6	106.6	13.2	42.4	7.0	27.7
Queue Delay	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Delay	62.5	13.6	106.6	14.2	42.4	7.0	27.7
Queue Length 50th (ft)	13	34	~117	66	126	0	27
Queue Length 95th (ft)	m20	#510	m#178	m#413	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1659	159	2032	441	530	445
Starvation Cap Reductn	0	0	0	683	0	0	0
Spillback Cap Reductn	0	44	0	0	0	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.62	1.04	0.76	0.46	0.37	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

Existing Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	904	75	519	496	728	123	943
v/c Ratio	0.80	0.81	0.74	0.61	0.92	0.57	0.68	0.91
Control Delay	63.6	16.5	80.7	36.5	63.1	28.0	50.5	45.3
Queue Delay	0.0	1.0	0.0	0.6	4.3	0.0	0.0	0.1
Total Delay	63.6	17.4	80.7	37.0	67.4	28.0	50.5	45.4
Queue Length 50th (ft)	83	255	48	153	161	192	77	292
Queue Length 95th (ft)	#217	#40	#121	211	#254	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1114	106	848	549	1276	239	1041
Starvation Cap Reductn	0	62	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	25	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.86	0.71	0.69	0.95	0.57	0.51	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #2
2010

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1238	109	813	121	299	64	223	208
v/c Ratio	0.97	0.73	0.64	0.86	0.57	0.69	0.24	0.79	0.50
Control Delay	67.5	25.9	51.9	58.0	51.6	46.2	41.8	56.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	25.9	51.9	58.0	51.6	46.2	41.8	56.5	9.2
Queue Length 50th (ft)	374	358	79	321	82	97	40	151	0
Queue Length 95th (ft)	#593	478	m120	#464	140	141	79	#241	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1686	193	948	257	522	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.73	0.56	0.86	0.47	0.57	0.21	0.69	0.47

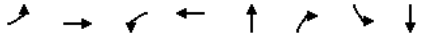
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	756	204	753	124	949
v/c Ratio	0.76	0.73	0.79	0.83	0.54	0.48	0.67
Control Delay	23.2	16.5	32.7	68.5	28.5	50.2	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	16.5	32.7	68.5	28.5	50.2	31.1
Queue Length 50th (ft)	24	81	234	141	215	82	289
Queue Length 95th (ft)	m31	88	272	#258	311	142	#439
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	213	1522	1200	257	1395	257	1410
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.58	0.63	0.79	0.54	0.48	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	46	69	85	167	174	59	125	255
v/c Ratio	0.21	0.30	0.15	0.28	0.28	0.10	0.49	0.29
Control Delay	34.5	33.3	1.1	0.4	30.1	9.4	32.9	15.8
Queue Delay	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Delay	34.5	33.3	1.2	0.5	30.1	9.4	32.9	15.8
Queue Length 50th (ft)	17	25	0	0	65	0	47	64
Queue Length 95th (ft)	62	83	2	0	166	33	132	161
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	624	652	958	950	868	791	624	1177
Starvation Cap Reductn	0	0	312	254	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.11	0.13	0.24	0.20	0.07	0.20	0.22

Intersection Summary

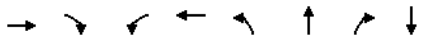
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	248	26	191	73
v/c Ratio	0.16	0.39	0.58	0.35
Control Delay	0.5	36.0	30.9	32.6
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	0.8	36.0	30.9	32.6
Queue Length 50th (ft)	4	9	71	26
Queue Length 95th (ft)	4	43	182	84
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1676	132	657	622
Starvation Cap Reductn	878	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.20	0.29	0.12

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	279	123	38	323	24	542
v/c Ratio	0.71	0.41	0.19	0.29	0.14	0.53
Control Delay	25.6	21.9	18.4	7.8	20.9	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	21.9	18.4	7.8	20.9	11.3
Queue Length 50th (ft)	51	31	10	30	7	61
Queue Length 95th (ft)	#147	70	27	137	23	#219
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	391	300	283	1109	283	1021
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.41	0.13	0.29	0.08	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	189	178	62	267	300	367
v/c Ratio	0.65	0.59	0.77	0.71	0.09	0.11	0.26	0.16
Control Delay	72.9	20.3	74.0	68.9	0.4	0.4	1.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	72.9	20.3	74.0	68.9	0.4	0.4	1.8	6.3
Queue Length 50th (ft)	45	0	132	118	1	1	2	41
Queue Length 95th (ft)	#112	56	#228	#198	m1	m1	m43	59
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	273	669	2389	1166	2226
Starvation Cap Reductn	0	0	0	0	0	0	491	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.70	0.65	0.09	0.11	0.44	0.16

Intersection Summary

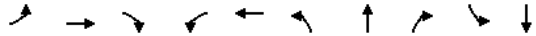
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	255	45	266	232	82	152
v/c Ratio	0.80	0.08	0.70	0.17	0.07	0.37
Control Delay	52.2	22.3	36.9	1.5	10.5	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	22.3	36.9	1.5	10.5	7.8
Queue Length 50th (ft)	176	12	58	4	22	0
Queue Length 95th (ft)	#258	m46	117	6	48	51
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	931	1236	1378	1096	453
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.05	0.22	0.17	0.07	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

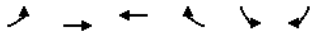
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	397	418	93	91	846	80	323
v/c Ratio	0.03	0.13	0.11	0.61	0.63	0.44	0.09	0.53	0.40	0.65
Control Delay	35.6	36.0	18.2	25.0	25.5	33.0	19.5	1.3	32.7	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	36.0	18.2	25.0	25.5	33.0	19.5	1.3	32.7	23.1
Queue Length 50th (ft)	2	9	0	151	161	39	15	0	34	123
Queue Length 95th (ft)	14	35	20	#367	#392	93	35	0	83	225
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	401	422	371	731	740	389	1339	1583	500	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.54	0.56	0.24	0.07	0.53	0.16	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	727	1020	845	136
v/c Ratio	0.37	0.20	0.53	0.71	0.85	0.25
Control Delay	39.1	4.8	18.4	10.6	35.1	4.8
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	39.1	4.8	19.0	10.6	35.2	4.8
Queue Length 50th (ft)	70	27	101	415	260	0
Queue Length 95th (ft)	126	57	m183	m641	300	38
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2152	1361	1441	1373	715
Starvation Cap Reductn	0	0	300	0	0	0
Spillback Cap Reductn	0	1	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.69	0.71	0.63	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	995	1104	365	584	684	672
v/c Ratio	0.24	0.42	0.74	0.48	0.91	1.08	0.94
Control Delay	25.2	9.1	17.1	2.5	50.6	84.3	47.4
Queue Delay	0.0	2.1	0.2	0.1	0.0	11.0	7.8
Total Delay	25.2	11.1	17.3	2.6	50.6	95.4	55.2
Queue Length 50th (ft)	17	153	124	3	366	~476	388
Queue Length 95th (ft)	m43	139	161	m17	#591	#721	#649
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	755	639	635	713
Starvation Cap Reductn	0	1198	0	40	0	0	0
Spillback Cap Reductn	0	156	49	0	0	16	35
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.83	0.77	0.51	0.91	1.11	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	525	1375	389	79	782	116	23	24	44	212	651
v/c Ratio	0.77	0.99	0.41	0.61	0.82	0.26	0.19	0.20	0.28	0.39	0.43
Control Delay	49.2	37.0	1.5	60.1	42.5	22.6	43.8	43.9	15.3	35.4	4.2
Queue Delay	0.0	12.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Total Delay	49.2	49.8	1.7	60.1	42.5	22.6	43.8	43.9	15.3	36.5	4.2
Queue Length 50th (ft)	171	~333	8	49	245	42	14	15	0	103	2
Queue Length 95th (ft)	m#221	m#617	m13	#106	318	89	40	41	32	m165	71
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	678	1395	937	142	956	450	185	186	213	538	1501
Starvation Cap Reductn	0	64	113	0	0	0	0	0	0	156	27
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.03	0.47	0.56	0.82	0.26	0.12	0.13	0.21	0.55	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

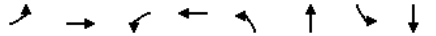
Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	512	133
v/c Ratio	0.07	0.07	0.23	0.22	0.13
Control Delay	26.1	25.7	2.6	7.6	10.3
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.1	25.7	3.4	7.6	10.3
Queue Length 50th (ft)	14	14	1	64	39
Queue Length 95th (ft)	38	31	24	87	53
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1189	2278	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.22	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	736	38	581	271	248	29	212	108
v/c Ratio	0.87	0.46	0.29	0.72	0.82	0.71	0.11	0.74	0.32
Control Delay	58.3	19.1	46.7	40.5	45.7	41.1	28.0	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	19.1	46.7	40.5	45.7	41.1	28.0	38.9	10.3
Queue Length 50th (ft)	255	150	23	176	169	148	13	131	1
Queue Length 95th (ft)	#538	242	55	238	259	231	30	152	40
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	475	1605	159	809	407	426	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.46	0.24	0.72	0.67	0.58	0.08	0.54	0.26

Intersection Summary

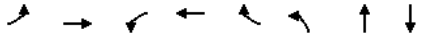
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	400	105	479	134	634	52	872
v/c Ratio	0.80	0.59	0.62	0.71	0.65	0.35	0.41	0.54
Control Delay	87.5	32.6	51.1	38.3	46.2	15.8	45.9	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	32.6	51.1	38.3	46.2	15.8	45.9	22.0
Queue Length 50th (ft)	63	105	65	151	83	117	32	196
Queue Length 95th (ft)	#154	147	118	191	137	192	69	316
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	897	212	1058	301	1834	230	1628
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.45	0.50	0.45	0.45	0.35	0.23	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



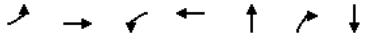
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	362	45	365	186	69	197	88
v/c Ratio	0.24	0.20	0.37	0.18	0.19	0.27	0.74	0.37
Control Delay	47.9	15.0	49.9	14.5	4.0	37.5	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	15.0	49.9	14.5	4.0	37.5	40.7	36.0
Queue Length 50th (ft)	16	54	28	43	0	40	116	50
Queue Length 95th (ft)	42	131	62	136	49	76	180	81
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1844	138	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.33	0.18	0.19	0.14	0.40	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	336	55	555	194	138	274	41	121	204
v/c Ratio	0.27	0.20	0.42	0.31	0.22	0.68	0.64	0.10	0.85	0.56
Control Delay	46.8	17.5	48.9	18.4	4.2	49.0	35.1	7.4	91.9	30.9
Queue Delay	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.5	48.9	19.2	4.7	49.0	35.1	7.4	91.9	30.9
Queue Length 50th (ft)	18	52	34	100	0	85	171	0	83	97
Queue Length 95th (ft)	46	115	71	196	47	144	206	23	#188	118
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1640	164	1783	894	266	671	596	142	538
Starvation Cap Reductn	0	0	0	876	380	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.20	0.34	0.61	0.38	0.52	0.41	0.07	0.85	0.38

Intersection Summary

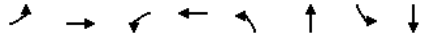
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	460	128	713	247	127	38
v/c Ratio	0.04	0.26	0.67	0.32	0.79	0.34	0.25
Control Delay	47.3	18.0	57.2	8.6	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.3	57.2	8.8	42.7	7.2	36.5
Queue Length 50th (ft)	2	84	82	18	153	0	21
Queue Length 95th (ft)	11	174	m120	m231	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1754	210	2227	487	520	329
Starvation Cap Reductn	0	676	0	726	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.43	0.61	0.48	0.51	0.24	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	439	34	652	314	834	168	974
v/c Ratio	0.63	0.57	0.20	0.90	0.65	0.53	0.77	0.64
Control Delay	61.0	31.1	47.2	48.0	47.8	24.4	49.1	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.0	31.1	47.2	48.0	47.8	24.4	49.1	26.8
Queue Length 50th (ft)	44	54	17	162	98	214	105	269
Queue Length 95th (ft)	120	184	m49	#266	144	318	168	368
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1034	181	789	481	1578	301	1511
Starvation Cap Reductn	0	0	0	0	0	0	0	68
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.42	0.19	0.83	0.65	0.53	0.56	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	429	82	642	240	394
v/c Ratio	0.28	0.22	0.44	0.31	0.40	0.73
Control Delay	16.1	8.8	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	8.8	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	19	79	23	30	25	51
Queue Length 95th (ft)	m28	115	55	93	51	#104
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2044	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.22	0.39	0.31	0.39	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.51	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	658	594	1096	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1133	1098
v/c Ratio	0.77	0.74	0.54	0.53
Control Delay	54.3	46.4	14.4	14.1
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.7	14.1
Queue Length 50th (ft)	94	136	231	220
Queue Length 95th (ft)	#144	185	303	289
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	389	631	2085	2079
Starvation Cap Reductn	0	0	371	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.66	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	549	1055
v/c Ratio	0.44	0.99	0.30	0.37
Control Delay	25.3	45.4	12.4	12.8
Queue Delay	0.0	0.0	1.5	0.0
Total Delay	25.3	45.4	13.9	12.8
Queue Length 50th (ft)	136	315	94	131
Queue Length 95th (ft)	184	#582	127	161
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	780	1825	2843
Starvation Cap Reductn	0	0	1047	0
Spillback Cap Reductn	14	0	0	55
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.97	0.71	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	586	457	620
v/c Ratio	0.68	0.36	0.75	0.25
Control Delay	25.3	13.5	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.5
Total Delay	25.3	13.5	34.4	5.1
Queue Length 50th (ft)	93	80	96	42
Queue Length 95th (ft)	130	131	#143	75
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1611	638	2462
Starvation Cap Reductn	0	0	0	1352
Spillback Cap Reductn	35	9	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.37	0.72	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1017	146	974	199	605	146	323	509
v/c Ratio	0.90	0.80	0.72	0.96	0.62	0.94	0.43	0.90	0.84
Control Delay	67.1	36.4	60.9	48.1	49.0	62.5	42.8	66.6	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.4	60.9	48.1	49.0	62.5	42.8	66.6	23.8
Queue Length 50th (ft)	210	336	99	~390	140	220	91	223	89
Queue Length 95th (ft)	#361	423	m112	m#435	m185	m#304	154	#378	#272
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1277	225	1016	322	646	354	373	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.65	0.96	0.62	0.94	0.41	0.87	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

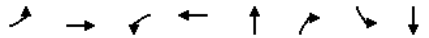
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	911	284	1226	196	1238
v/c Ratio	1.33	0.62	0.80	1.04	1.10	0.81	1.18
Control Delay	207.6	25.8	32.5	110.4	93.3	72.2	125.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	207.6	25.8	32.5	110.4	93.3	72.2	125.5
Queue Length 50th (ft)	~194	314	278	~217	~516	136	~548
Queue Length 95th (ft)	m#275	m375	367	#386	#653	#257	#686
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	156	1517	1138	274	1118	241	1050
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.33	0.62	0.80	1.04	1.10	0.81	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	106	89	162	351	502	247	94	296
v/c Ratio	0.58	0.46	0.24	0.50	0.98	0.42	0.61	0.40
Control Delay	50.4	48.0	1.2	1.2	76.4	10.5	60.9	25.4
Queue Delay	0.0	0.0	0.8	1.2	0.0	0.0	0.0	0.0
Total Delay	50.4	48.0	2.0	2.4	76.4	10.5	60.9	25.4
Queue Length 50th (ft)	72	59	2	0	353	22	64	138
Queue Length 95th (ft)	136	116	m2	m0	#664	98	#136	248
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	328	343	786	799	512	588	180	757
Starvation Cap Reductn	0	0	398	251	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.26	0.42	0.64	0.98	0.42	0.52	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	424	35	394	141
v/c Ratio	0.28	0.51	0.91	0.68
Control Delay	1.6	68.1	69.4	49.8
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	2.1	68.1	69.4	49.8
Queue Length 50th (ft)	23	22	273	93
Queue Length 95th (ft)	29	#79	#530	166
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1483	69	431	313
Starvation Cap Reductn	665	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.51	0.91	0.45

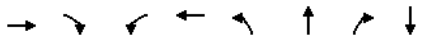
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	469	175	172	738	20	559
v/c Ratio	1.07	0.38	0.78	0.76	0.12	0.83
Control Delay	85.3	17.2	44.3	20.0	22.7	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.3	17.2	44.3	20.0	22.7	25.7
Queue Length 50th (ft)	~173	41	56	205	8	128
Queue Length 95th (ft)	#329	86	m#128	#476	m14	m#200
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	440	466	225	972	225	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.38	0.76	0.76	0.09	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



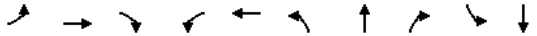
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	416	394	144	413	185	493
v/c Ratio	0.17	0.54	0.55	0.53	0.52	0.30	0.28	0.40
Control Delay	50.6	16.8	9.6	8.6	30.4	20.2	4.5	24.9
Queue Delay	0.0	0.3	1.3	1.1	0.0	0.4	0.4	0.0
Total Delay	50.6	17.1	10.9	9.7	30.4	20.6	4.9	24.9
Queue Length 50th (ft)	12	0	95	86	39	58	12	126
Queue Length 95th (ft)	35	52	135	118	m58	m74	m23	172
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	748	278	1358	671	1238
Starvation Cap Reductn	0	0	155	153	0	507	195	0
Spillback Cap Reductn	0	10	165	162	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.48	0.71	0.67	0.52	0.49	0.39	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	167	39	471	708	217	341
v/c Ratio	0.71	0.06	0.65	0.48	0.21	0.82
Control Delay	30.9	0.6	44.3	1.5	16.5	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	0.6	44.3	1.5	16.5	18.0
Queue Length 50th (ft)	59	0	127	5	75	70
Queue Length 95th (ft)	114	2	105	17	162	165
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	820	1155	1480	1018	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.05	0.41	0.48	0.21	0.58

Intersection Summary

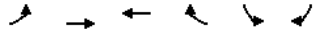


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	319	333	12	724	1402	283	634
v/c Ratio	0.59	1.21	0.22	0.82	0.86	0.13	0.88	0.89	0.86	0.78
Control Delay	46.7	154.9	28.6	44.4	46.0	47.6	44.9	8.6	49.3	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	154.9	28.6	44.4	46.0	47.6	44.9	8.6	49.3	31.4
Queue Length 50th (ft)	109	~321	23	195	207	7	234	0	170	310
Queue Length 95th (ft)	#193	#506	62	#328	#350	26	#342	#16	#294	#603
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	306	322	291	445	447	241	868	1583	387	810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.21	0.22	0.72	0.74	0.05	0.83	0.89	0.73	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1268	1165	982	347
v/c Ratio	0.46	0.47	0.95dr	0.83	0.91	0.50
Control Delay	45.4	5.2	18.5	17.2	46.0	8.5
Queue Delay	0.0	0.0	178.6	0.0	3.8	0.0
Total Delay	45.4	5.2	197.1	17.2	49.8	8.5
Queue Length 50th (ft)	94	71	410	654	335	29
Queue Length 95th (ft)	158	114	m362	m550	#445	106
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2210	1381	1399	1124	711
Starvation Cap Reductn	0	0	476	0	0	0
Spillback Cap Reductn	0	15	0	0	85	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.40	0.83	0.95	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1256	1834	431	601	808	570
v/c Ratio	0.44	0.84	1.09	0.57	1.06	1.37	1.66
Control Delay	64.7	15.0	77.4	6.2	92.1	206.3	332.0
Queue Delay	0.0	14.9	139.5	0.3	30.5	29.6	73.7
Total Delay	64.7	29.9	216.9	6.5	122.7	235.8	405.7
Queue Length 50th (ft)	108	82	~568	33	~493	~772	~991
Queue Length 95th (ft)	m140	100	m#534	m31	#723	#1036	#959
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	761	565	588	344
Starvation Cap Reductn	0	158	106	57	0	0	0
Spillback Cap Reductn	0	247	379	0	38	27	31
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.01	1.40	0.61	1.14	1.44	1.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	501	1124	771	342	1236	253	76	80	69	435	776
v/c Ratio	0.94	1.11	1.10	1.25	1.16	0.50	0.36	0.37	0.26	0.88	0.64
Control Delay	60.2	89.3	70.3	174.6	119.7	33.1	50.0	50.4	25.1	54.9	11.0
Queue Delay	0.0	21.7	6.6	0.0	190.5	0.0	0.0	0.0	0.0	34.2	0.1
Total Delay	60.2	111.0	76.9	174.6	310.2	33.1	50.0	50.4	25.1	89.0	11.1
Queue Length 50th (ft)	191	~491	~450	~296	~532	146	61	64	19	324	165
Queue Length 95th (ft)	m178	m#404	m#367	#494	#697	241	113	118	66	#475	119
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1011	700	274	1062	503	214	217	262	493	1209
Starvation Cap Reductn	0	44	10	0	0	0	0	0	0	82	46
Spillback Cap Reductn	0	0	0	0	285	0	0	0	0	0	14
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.16	1.12	1.25	1.59	0.50	0.36	0.37	0.26	1.06	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1182	256
v/c Ratio	0.17	0.17	0.45	0.57	0.42
Control Delay	33.2	32.0	7.8	15.5	42.0
Queue Delay	2.3	1.3	0.4	0.0	0.0
Total Delay	35.5	33.3	8.3	15.5	42.0
Queue Length 50th (ft)	61	64	73	255	179
Queue Length 95th (ft)	118	104	134	317	266
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1919	2069	610
Starvation Cap Reductn	352	752	548	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.63	0.57	0.42

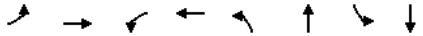
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1095	21	796	522	565	72	256	160
v/c Ratio	1.24	1.06	0.23	1.09	0.77	0.80	0.24	0.80	0.40
Control Delay	197.5	77.8	55.4	100.2	40.1	41.1	47.3	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	3.8	7.6	0.0	0.0	0.0
Total Delay	197.5	77.8	55.4	100.2	43.9	48.7	47.3	54.1	15.9
Queue Length 50th (ft)	~182	233	15	~331	297	330	51	187	13
Queue Length 95th (ft)	#333	#627	41	#457	#562	#613	100	273	86
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1036	97	733	677	707	499	525	549
Starvation Cap Reductn	0	0	0	0	89	108	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.06	0.22	1.09	0.89	0.94	0.14	0.49	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

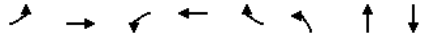


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	899	107	557	188	1408	118	1256
v/c Ratio	0.83	0.91	0.64	0.64	0.80	1.09	0.67	1.07
Control Delay	69.8	44.0	49.4	31.3	55.8	84.6	52.2	80.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	44.0	49.4	31.3	55.8	84.6	52.2	80.2
Queue Length 50th (ft)	90	250	59	139	104	~526	65	~466
Queue Length 95th (ft)	#194	#368	112	192	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	993	197	977	256	1288	197	1170
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.91	0.54	0.57	0.73	1.09	0.60	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	902	84	708	58	227	270	313
v/c Ratio	0.26	0.66	0.58	0.46	0.08	0.73	0.80	0.84
Control Delay	48.8	30.6	58.8	25.4	8.4	41.2	36.0	43.2
Queue Delay	0.0	2.3	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	33.0	58.8	25.9	8.4	41.2	36.0	43.2
Queue Length 50th (ft)	17	246	52	173	0	139	140	191
Queue Length 95th (ft)	44	#466	#127	#327	32	196	206	266
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1365	152	1542	693	478	491	494
Starvation Cap Reductn	0	320	0	401	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.86	0.55	0.62	0.08	0.47	0.55	0.63

Intersection Summary

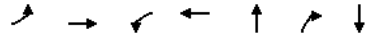
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	842	148	614	216	220	341	140	262	508
v/c Ratio	0.39	0.75	0.74	0.43	0.30	1.04	0.64	0.26	1.24	0.97
Control Delay	46.8	35.2	56.0	24.4	4.6	116.6	37.3	6.0	174.2	60.7
Queue Delay	0.0	6.6	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	41.8	56.0	25.4	4.9	116.6	37.3	6.0	174.2	60.7
Queue Length 50th (ft)	30	252	91	157	0	~152	189	0	~210	319
Queue Length 95th (ft)	64	328	#168	220	50	#297	285	44	#373	#488
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1120	230	1419	728	212	540	540	212	533
Starvation Cap Reductn	0	230	0	536	195	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.95	0.64	0.70	0.41	1.04	0.63	0.26	1.24	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1146	166	948	336	301	193
v/c Ratio	0.18	0.93	0.75	0.66	0.87	0.56	0.72
Control Delay	39.9	47.4	49.6	19.9	48.4	9.2	45.1
Queue Delay	0.0	87.7	0.0	0.6	0.0	1.7	3.3
Total Delay	39.9	135.1	49.6	20.5	48.4	10.9	48.4
Queue Length 50th (ft)	18	363	103	130	205	17	116
Queue Length 95th (ft)	46	#656	m59	m271	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1232	301	1446	452	589	349
Starvation Cap Reductn	0	276	0	190	0	0	0
Spillback Cap Reductn	0	165	0	0	0	150	83
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.20	0.55	0.75	0.74	0.69	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1093	49	696	505	1282	281	1343
v/c Ratio	0.92	1.08	0.51	1.03	1.13	0.98	1.08	1.00
Control Delay	49.4	76.4	59.7	76.4	124.6	52.7	123.1	55.0
Queue Delay	0.0	15.2	0.0	0.0	17.7	0.0	0.0	13.0
Total Delay	49.4	91.7	59.7	76.4	142.3	52.7	123.1	68.0
Queue Length 50th (ft)	112	~382	32	~239	~193	418	~210	~453
Queue Length 95th (ft)	m#131	m#440	m65	#330	#296	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1009	106	678	446	1307	259	1349
Starvation Cap Reductn	0	33	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	16	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.12	0.46	1.03	1.17	0.98	1.08	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

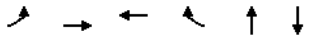
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	877	47	700	440	450
v/c Ratio	0.14	0.44	0.26	0.33	0.66	0.83
Control Delay	20.7	9.3	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	9.3	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	126	13	35	50	51
Queue Length 95th (ft)	m9	m141	36	101	88	#117
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	248	2115	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.19	0.33	0.64	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

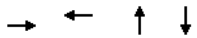
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1599	1679
v/c Ratio	1.08	0.74	0.81	0.85
Control Delay	107.2	47.0	23.0	25.0
Queue Delay	0.0	0.0	2.5	0.0
Total Delay	107.2	47.0	25.5	25.0
Queue Length 50th (ft)	~197	129	436	478
Queue Length 95th (ft)	#306	180	555	609
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1974
Starvation Cap Reductn	0	0	252	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.93	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1092	1614
v/c Ratio	0.45	1.39	0.66	0.52
Control Delay	27.1	211.1	13.8	10.7
Queue Delay	0.3	0.0	30.3	0.3
Total Delay	27.4	211.1	44.1	11.0
Queue Length 50th (ft)	113	~545	194	174
Queue Length 95th (ft)	159	#769	262	210
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	555	1657	3103
Starvation Cap Reductn	0	0	618	0
Spillback Cap Reductn	158	0	0	790
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.39	1.05	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

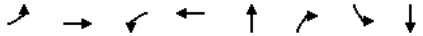
Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1087	788	908
v/c Ratio	0.96	0.82	0.88	0.38
Control Delay	61.0	37.5	46.6	8.5
Queue Delay	27.8	46.4	145.2	4.9
Total Delay	88.7	83.8	191.8	13.4
Queue Length 50th (ft)	308	367	269	134
Queue Length 95th (ft)	#437	#470	341	168
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1327	967	2384
Starvation Cap Reductn	0	0	370	1390
Spillback Cap Reductn	92	334	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.09	1.32	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1004: 65th Street & Shellmound St

2010 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	64	147	172	491	248	90	404
v/c Ratio	0.46	0.36	0.26	0.29	0.72	0.34	0.58	0.46
Control Delay	45.8	39.5	13.1	5.6	39.6	8.4	52.1	22.1
Queue Delay	0.0	0.0	1.0	0.8	0.0	0.0	0.0	0.0
Total Delay	45.8	39.5	14.1	6.4	39.6	8.4	52.1	22.1
Queue Length 50th (ft)	47	33	35	13	296	17	55	178
Queue Length 95th (ft)	99	79	61	38	#579	88	117	318
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	378	392	771	777	682	722	208	905
Starvation Cap Reductn	0	0	424	379	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.16	0.42	0.43	0.72	0.34	0.43	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1005: 65th Street & Overland Avenue

2010 Plus Alt#2 SAT

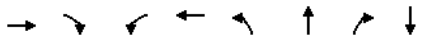
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	115	42	87	79
v/c Ratio	0.08	0.74	0.24	0.50
Control Delay	0.6	64.3	34.7	43.2
Queue Delay	0.5	0.0	0.0	0.0
Total Delay	1.1	64.3	34.7	43.2
Queue Length 50th (ft)	3	24	45	44
Queue Length 95th (ft)	5	#89	97	98
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1605	80	497	359
Starvation Cap Reductn	1209	0	0	0
Spillback Cap Reductn	0	0	2	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.53	0.18	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1009: Shellmound Way & Christie Ave

2010 Plus Alt#2 SAT



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	512	478	164	366	353	501
v/c Ratio	0.14	0.33	0.92	0.87	0.75	0.31	0.48	0.46
Control Delay	35.6	12.5	33.1	28.2	31.7	13.0	2.0	30.1
Queue Delay	0.0	0.3	31.4	17.2	0.0	0.0	1.3	0.1
Total Delay	35.6	12.8	64.4	45.5	31.7	13.0	3.4	30.1
Queue Length 50th (ft)	33	17	369	335	31	35	0	146
Queue Length 95th (ft)	69	72	#567	#508	m144	m48	m6	198
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	444	596	588	219	1199	737	1089
Starvation Cap Reductn	0	0	98	92	0	0	208	0
Spillback Cap Reductn	0	69	108	107	0	0	0	60
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.39	1.05	0.99	0.75	0.31	0.67	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St

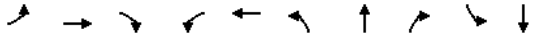
2010 Plus Alt#2 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	309	78	712	955	268	295
v/c Ratio	0.86	0.10	0.83	0.71	0.33	0.27
Control Delay	28.5	1.4	22.4	22.9	24.8	6.4
Queue Delay	0.3	0.0	0.4	2.6	0.0	0.0
Total Delay	28.7	1.4	22.8	25.4	24.8	6.4
Queue Length 50th (ft)	210	6	203	710	118	51
Queue Length 95th (ft)	279	10	m243	m819	237	112
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	960	1186	1347	817	1215
Starvation Cap Reductn	19	0	0	266	0	0
Spillback Cap Reductn	0	0	131	0	0	22
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.08	0.67	0.88	0.33	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#2 SAT

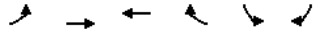


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	504	490	45	318	1175	147	502
v/c Ratio	0.21	0.16	0.06	0.79	0.77	0.31	0.34	0.74	0.62	0.80
Control Delay	35.8	35.6	20.7	35.7	34.0	35.4	23.8	3.2	32.6	29.4
Queue Delay	0.0	0.0	0.0	3.4	2.6	0.0	0.0	0.0	0.0	1.5
Total Delay	35.8	35.6	20.7	39.1	36.7	35.4	23.8	3.2	32.6	31.0
Queue Length 50th (ft)	13	11	0	250	240	21	64	0	69	219
Queue Length 95th (ft)	39	34	13	#488	#471	54	111	0	126	#417
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	337	354	307	637	638	320	1108	1583	450	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	23	68	68	0	0	0	0	91
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.89	0.86	0.14	0.29	0.74	0.33	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd
2010 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	783	1034	1188	263
v/c Ratio	0.68	0.16	0.59	0.74	0.89	0.35
Control Delay	51.4	14.3	20.9	16.7	34.0	4.9
Queue Delay	0.0	0.0	4.6	0.0	32.7	0.0
Total Delay	51.4	14.3	25.5	16.7	66.7	4.9
Queue Length 50th (ft)	85	55	229	539	396	16
Queue Length 95th (ft)	141	93	m314	712	427	60
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1900	1329	1399	1592	855
Starvation Cap Reductn	0	0	462	0	317	0
Spillback Cap Reductn	0	0	0	0	471	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.90	0.74	1.06	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1372	1397	437	420	705	683
v/c Ratio	0.73	1.15	0.83	0.54	0.57	0.89	1.75
Control Delay	67.6	97.6	38.4	7.4	27.1	31.8	368.5
Queue Delay	0.0	147.9	1.1	0.2	0.4	1.0	14.3
Total Delay	67.6	245.5	39.6	7.5	27.6	32.8	382.8
Queue Length 50th (ft)	71	~425	334	19	229	323	~754
Queue Length 95th (ft)	m107	#529	#423	m108	336	#616	#1144
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1677	806	734	793	391
Starvation Cap Reductn	0	269	103	50	0	0	0
Spillback Cap Reductn	0	80	112	0	75	16	7
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.48	0.89	0.58	0.64	0.91	1.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2010 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	553	1451	734	380	726	246	153	161	110	547	854
v/c Ratio	0.93	1.31	1.21	1.39	0.68	0.47	0.84	0.86	0.42	1.10	0.66
Control Delay	59.0	170.6	117.2	231.4	37.8	22.0	91.5	93.8	26.5	98.8	10.1
Queue Delay	0.0	13.6	2.6	0.0	0.3	0.0	0.0	0.0	0.0	88.2	2.3
Total Delay	59.0	184.2	119.9	231.4	38.1	22.0	91.5	93.8	26.5	187.0	12.4
Queue Length 50th (ft)	205	~669	~597	~358	237	84	121	127	25	~427	58
Queue Length 95th (ft)	m174	m#503	m#401	#545	304	161	m#235	m#249	m69	m#609	m170
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	524	183	188	261	496	1300
Starvation Cap Reductn	0	25	3	0	0	0	0	0	0	78	305
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	56
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.34	1.22	1.39	0.72	0.47	0.84	0.86	0.42	1.31	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St

2010 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1653	348
v/c Ratio	0.21	0.22	0.88	0.89	0.41
Control Delay	23.3	22.9	31.7	18.7	15.1
Queue Delay	1.2	0.7	5.6	0.4	0.0
Total Delay	24.5	23.6	37.3	19.1	15.1
Queue Length 50th (ft)	78	82	336	580	186
Queue Length 95th (ft)	127	114	#540	148	195
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	58	122	0	34	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.90	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street

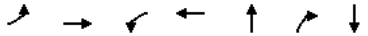
2010 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	979	41	824	254	262	39	250	103
v/c Ratio	0.80	0.85	0.38	0.89	0.69	0.68	0.11	0.66	0.26
Control Delay	80.2	31.0	40.6	38.5	29.1	27.9	21.0	28.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.2	31.0	40.6	38.5	29.1	27.9	21.0	28.0	6.7
Queue Length 50th (ft)	37	~204	16	163	90	90	12	89	0
Queue Length 95th (ft)	#120	#346	#46	#299	166	166	35	160	34
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	116	1155	109	923	438	458	436	459	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.85	0.38	0.89	0.58	0.57	0.09	0.54	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street
2010 Plus Alt#2 SAT

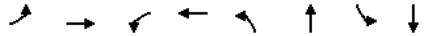


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1269	190	1198	226	237	60
v/c Ratio	0.32	0.78	1.19	0.60	0.75	0.52	0.24
Control Delay	62.0	21.8	140.4	15.1	43.0	6.8	27.9
Queue Delay	0.0	41.0	0.0	3.8	0.0	0.1	0.0
Total Delay	62.0	62.8	140.4	19.0	43.0	6.9	27.9
Queue Length 50th (ft)	14	84	~144	63	140	0	28
Queue Length 95th (ft)	m24	#706	m#157	m#451	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1619	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	701	0	0	0
Spillback Cap Reductn	0	446	0	0	0	30	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.08	1.19	0.92	0.51	0.45	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue
2010 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1136	78	678	595	1015	160	1217
v/c Ratio	0.81	1.02	0.76	0.81	1.08	0.82	0.78	1.16
Control Delay	62.6	45.6	84.2	44.1	103.7	36.3	57.0	114.3
Queue Delay	0.0	20.9	0.0	4.1	64.5	0.0	0.0	0.5
Total Delay	62.6	66.5	84.2	48.2	168.2	36.3	57.0	114.8
Queue Length 50th (ft)	88	~403	50	212	~220	312	99	~481
Queue Length 95th (ft)	m166	#505	#128	#307	#328	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1109	106	833	549	1243	239	1051
Starvation Cap Reductn	0	58	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	94	68	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.08	0.74	0.92	1.24	0.82	0.67	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #2
2030

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1324	124	881	125	349	72	287	214
v/c Ratio	1.08	0.84	0.70	1.05	0.55	0.75	0.24	0.91	0.48
Control Delay	97.5	31.5	50.1	82.9	51.2	49.7	41.7	74.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	31.5	50.1	82.9	51.2	49.7	41.7	74.5	9.3
Queue Length 50th (ft)	~479	418	88	~380	83	117	44	200	0
Queue Length 95th (ft)	#697	#538	m95	m#484	143	167	88	#354	65
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1582	193	839	257	519	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.84	0.64	1.05	0.49	0.67	0.24	0.89	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	884	229	919	125	1097
v/c Ratio	0.84	0.66	0.94	0.91	0.77	0.49	0.92
Control Delay	34.1	12.1	40.4	81.2	38.3	50.4	48.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	12.1	40.4	81.2	38.3	50.4	48.0
Queue Length 50th (ft)	19	66	283	161	315	82	~412
Queue Length 95th (ft)	m28	97	#412	#302	397	143	#560
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	166	1521	1013	257	1192	257	1197
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.62	0.87	0.89	0.77	0.49	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	56	69	85	283	141	59	126	432
v/c Ratio	0.32	0.38	0.11	0.34	0.56	0.21	0.58	0.75
Control Delay	40.6	39.4	2.6	0.8	37.5	10.9	39.4	25.8
Queue Delay	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0
Total Delay	40.6	39.4	2.8	1.2	37.5	10.9	39.4	25.8
Queue Length 50th (ft)	28	33	2	0	70	0	63	189
Queue Length 95th (ft)	77	88	8	0	152	36	141	341
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	452	472	931	959	565	545	452	1109
Starvation Cap Reductn	0	0	490	297	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.19	0.43	0.25	0.11	0.28	0.39

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	249	53	191	193
v/c Ratio	0.18	0.63	0.45	0.70
Control Delay	0.8	60.3	34.7	38.3
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	1.4	60.3	34.7	38.3
Queue Length 50th (ft)	6	24	84	94
Queue Length 95th (ft)	6	#111	198	199
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1429	95	475	452
Starvation Cap Reductn	841	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.56	0.40	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	284	123	38	371	24	655
v/c Ratio	0.73	0.41	0.19	0.33	0.14	0.64
Control Delay	27.3	21.9	18.7	8.1	20.9	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.9	18.7	8.1	20.9	14.7
Queue Length 50th (ft)	53	31	11	35	7	81
Queue Length 95th (ft)	#153	70	27	157	23	#336
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	387	299	283	1109	283	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.41	0.13	0.33	0.08	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	213	199	63	199	255	358
v/c Ratio	0.65	0.59	0.83	0.77	0.09	0.08	0.22	0.16
Control Delay	72.9	20.3	82.0	75.1	0.6	0.5	0.9	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	72.9	20.3	82.0	75.1	0.6	0.5	1.3	6.4
Queue Length 50th (ft)	45	0	150	134	1	1	5	40
Queue Length 95th (ft)	#112	56	#269	#237	m1	1	18	58
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	670	2366	1143	2214
Starvation Cap Reductn	0	0	0	0	0	0	468	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.79	0.73	0.09	0.08	0.38	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	215	40	300	201	138	162
v/c Ratio	0.73	0.07	0.69	0.14	0.13	0.41
Control Delay	47.7	21.9	37.8	1.1	10.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	21.9	37.8	1.1	10.9	7.8
Queue Length 50th (ft)	137	7	61	3	38	0
Queue Length 95th (ft)	224	m29	139	5	76	52
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	904	1236	1406	1097	460
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.04	0.24	0.14	0.13	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	411	433	93	111	911	80	349
v/c Ratio	0.03	0.14	0.12	0.61	0.63	0.46	0.11	0.58	0.41	0.70
Control Delay	35.8	36.2	18.2	25.8	26.3	33.5	19.6	1.5	33.1	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.8	26.3	33.5	19.6	1.5	33.1	24.2
Queue Length 50th (ft)	2	9	0	163	173	40	19	0	34	136
Queue Length 95th (ft)	14	35	20	#385	#413	93	41	0	83	246
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	382	402	355	720	729	371	1289	1583	480	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.57	0.59	0.25	0.09	0.58	0.17	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	780	1103	886	151
v/c Ratio	0.38	0.22	0.59	0.77	0.86	0.26
Control Delay	39.1	5.1	18.7	12.9	34.9	4.5
Queue Delay	0.0	0.0	1.0	0.0	0.1	0.0
Total Delay	39.1	5.1	19.7	12.9	35.0	4.5
Queue Length 50th (ft)	71	31	106	553	272	0
Queue Length 95th (ft)	126	63	m195	m687	314	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2124	1323	1441	1373	724
Starvation Cap Reductn	0	0	285	0	0	0
Spillback Cap Reductn	0	1	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.75	0.77	0.66	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1047	1203	406	628	733	720
v/c Ratio	0.27	0.44	0.81	0.52	0.98	1.17	1.02
Control Delay	27.2	9.1	18.8	2.6	63.7	117.0	65.4
Queue Delay	0.0	2.2	0.5	0.1	0.0	38.2	50.3
Total Delay	27.2	11.3	19.3	2.7	63.7	155.2	115.7
Queue Length 50th (ft)	21	157	137	6	410	~559	~471
Queue Length 95th (ft)	m48	144	m190	m15	#657	#808	#732
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	783	639	629	707
Starvation Cap Reductn	0	1156	0	43	0	0	0
Spillback Cap Reductn	0	170	64	0	0	44	81
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.85	0.55	0.98	1.25	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	390	1601	334	75	843	112	22	23	42	204	651
v/c Ratio	0.57	1.14	0.37	0.59	0.88	0.25	0.19	0.19	0.28	0.38	0.43
Control Delay	42.2	90.8	1.6	58.4	47.2	23.3	43.9	44.0	15.4	36.4	4.5
Queue Delay	0.0	11.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Total Delay	42.2	102.4	1.8	58.4	47.2	23.3	43.9	44.0	15.4	37.4	4.5
Queue Length 50th (ft)	117	~656	9	47	271	42	14	14	0	100	24
Queue Length 95th (ft)	m143	m#735	m14	#95	#378	87	38	40	32	m150	81
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	687	1403	897	142	956	447	185	186	212	538	1508
Starvation Cap Reductn	0	32	128	0	0	0	0	0	0	159	27
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	1.17	0.43	0.53	0.88	0.25	0.12	0.12	0.20	0.54	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	520	180
v/c Ratio	0.07	0.07	0.20	0.23	0.17
Control Delay	27.1	26.6	3.1	7.6	12.1
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.1	26.6	3.8	7.6	12.1
Queue Length 50th (ft)	15	14	0	65	53
Queue Length 95th (ft)	38	31	25	88	92
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2277	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.23	0.17

Intersection Summary

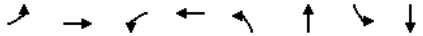
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	814	38	632	312	313	32	306	115
v/c Ratio	1.12	0.57	0.29	0.78	0.86	0.83	0.09	0.86	0.29
Control Delay	122.0	23.4	46.7	43.2	52.0	48.8	24.7	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.0	23.4	46.7	43.2	52.0	48.8	24.7	45.3	10.2
Queue Length 50th (ft)	~365	205	23	196	199	197	12	161	9
Queue Length 95th (ft)	#556	277	55	261	#322	#309	m26	#305	44
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	380	1434	159	810	407	426	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.57	0.24	0.78	0.77	0.73	0.09	0.78	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

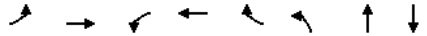
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	456	111	564	132	808	52	1042
v/c Ratio	0.87	0.67	0.64	0.75	0.65	0.46	0.41	0.67
Control Delay	99.9	34.6	52.0	37.9	46.2	18.8	45.9	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	34.6	52.0	37.9	46.2	18.8	45.9	26.6
Queue Length 50th (ft)	70	126	69	178	82	170	32	264
Queue Length 95th (ft)	#171	168	124	217	136	270	69	#452
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	892	212	1058	301	1756	230	1546
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.51	0.52	0.53	0.44	0.46	0.23	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	382	87	426	341	78	440	261
v/c Ratio	0.25	0.32	0.58	0.30	0.41	0.17	0.93	0.79
Control Delay	48.4	26.6	58.3	24.5	5.1	29.3	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.6	58.3	24.5	5.5	29.3	56.0	41.8
Queue Length 50th (ft)	16	93	53	90	0	38	265	160
Queue Length 95th (ft)	43	148	#126	175	71	76	#442	222
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1176	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.32	0.56	0.30	0.51	0.16	0.88	0.53

Intersection Summary

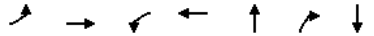
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	441	60	811	219	137	347	42	168	275
v/c Ratio	0.27	0.28	0.44	0.47	0.25	0.67	0.74	0.10	1.18	0.69
Control Delay	46.8	19.9	49.6	21.6	4.1	48.9	36.1	7.4	172.5	32.8
Queue Delay	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	19.9	49.6	23.2	4.5	48.9	36.1	7.4	172.5	32.8
Queue Length 50th (ft)	18	87	37	185	0	85	206	0	~134	125
Queue Length 95th (ft)	46	155	76	302	50	144	266	23	#266	183
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1569	165	1711	879	266	671	597	142	539
Starvation Cap Reductn	0	0	0	676	312	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.36	0.78	0.39	0.52	0.52	0.07	1.18	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

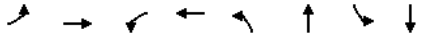


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	609	128	913	444	127	58
v/c Ratio	0.04	0.44	0.68	0.49	0.94	0.27	0.39
Control Delay	47.3	24.8	49.7	11.1	60.4	12.3	39.1
Queue Delay	0.0	0.7	0.0	0.6	0.0	0.0	0.0
Total Delay	47.3	25.5	49.7	11.7	60.4	12.3	39.1
Queue Length 50th (ft)	2	146	58	31	274	19	33
Queue Length 95th (ft)	11	234	m107	m282	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1393	208	1857	489	491	295
Starvation Cap Reductn	0	439	0	525	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.64	0.62	0.69	0.91	0.26	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	558	34	840	367	1020	175	1136
v/c Ratio	0.63	0.56	0.19	0.86	0.76	0.79	0.78	0.92
Control Delay	68.9	41.3	46.3	45.3	52.9	34.9	49.7	44.3
Queue Delay	0.0	0.0	0.0	0.1	2.2	0.0	0.0	0.1
Total Delay	68.9	41.3	46.3	45.4	55.1	34.9	49.7	44.4
Queue Length 50th (ft)	71	126	17	208	117	303	109	360
Queue Length 95th (ft)	126	234	m51	#421	#178	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1167	194	974	481	1286	301	1233
Starvation Cap Reductn	0	12	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	4	40	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.48	0.18	0.87	0.83	0.79	0.58	0.92

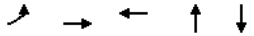
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	506	117	828	240	409
v/c Ratio	0.31	0.28	0.59	0.41	0.40	0.75
Control Delay	17.8	9.7	32.8	7.7	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	9.7	32.8	7.7	16.0	26.3
Queue Length 50th (ft)	19	79	33	42	25	52
Queue Length 95th (ft)	m39	m116	#86	126	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.28	0.55	0.41	0.39	0.72

Intersection Summary

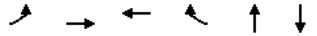
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	447	63	183	5	298
v/c Ratio	0.63	0.06	0.44	0.01	0.52
Control Delay	9.9	4.3	10.2	11.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	4.3	10.2	11.0	5.5
Queue Length 50th (ft)	37	4	18	1	10
Queue Length 95th (ft)	#120	19	64	6	58
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	727	1192	647	735	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.05	0.28	0.01	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	565	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1355	1293
v/c Ratio	0.83	0.77	0.66	0.63
Control Delay	60.2	47.9	17.1	16.4
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	60.2	47.9	17.7	16.4
Queue Length 50th (ft)	101	147	315	291
Queue Length 95th (ft)	#170	202	398	369
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	321	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.78	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	670	1244
v/c Ratio	0.58	1.17	0.37	0.45
Control Delay	27.5	115.9	13.5	14.0
Queue Delay	0.1	0.0	3.3	0.0
Total Delay	27.6	115.9	16.8	14.1
Queue Length 50th (ft)	201	~560	120	163
Queue Length 95th (ft)	262	#797	159	197
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1304	730	1789	2792
Starvation Cap Reductn	0	0	994	0
Spillback Cap Reductn	38	0	0	204
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.17	0.84	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	708	560	705
v/c Ratio	0.71	0.47	0.88	0.29
Control Delay	25.2	15.7	45.2	5.4
Queue Delay	0.0	0.0	0.0	0.7
Total Delay	25.2	15.8	45.2	6.1
Queue Length 50th (ft)	108	106	122	53
Queue Length 95th (ft)	146	170	#206	94
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	638	2392
Starvation Cap Reductn	0	0	0	1252
Spillback Cap Reductn	47	76	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.49	0.88	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1054	156	1031	216	682	159	399	533
v/c Ratio	0.92	0.85	0.76	1.05	0.67	1.06	0.45	1.07	0.88
Control Delay	71.3	39.8	57.3	61.9	51.1	89.7	43.4	109.1	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	39.8	57.3	61.9	51.1	89.7	43.4	109.1	30.0
Queue Length 50th (ft)	219	355	108	~428	152	~271	99	~313	120
Queue Length 95th (ft)	#380	#458	m98	m341	m195	m#365	166	#503	#324
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	646	354	373	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.67	1.06	0.45	1.07	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	987	294	1443	201	1386
v/c Ratio	1.61	0.67	1.05	1.07	1.29	0.83	1.32
Control Delay	324.4	26.5	74.7	120.0	170.9	74.7	182.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.4	26.5	74.7	120.0	170.9	74.7	182.9
Queue Length 50th (ft)	~220	344	~396	~232	~687	140	~666
Queue Length 95th (ft)	m#285	m399	#529	#402	#827	#266	#805
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	132	1518	938	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.61	0.67	1.05	1.07	1.29	0.83	1.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	105	89	162	639	707	98	477
v/c Ratio	0.77	0.62	0.23	0.81	1.25	0.69	0.62
Control Delay	85.4	71.2	6.2	7.5	162.4	80.4	31.2
Queue Delay	0.0	0.0	5.4	100.4	0.0	0.0	0.0
Total Delay	85.4	71.2	11.6	107.9	162.4	80.4	31.2
Queue Length 50th (ft)	85	69	13	30	~705	79	287
Queue Length 95th (ft)	#177	#134	m10	m0	#946	#162	404
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	142	150	710	790	566	142	774
Starvation Cap Reductn	0	0	482	265	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.59	0.71	1.22	1.25	0.69	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	429	39	394	453
v/c Ratio	0.32	0.66	1.25	1.27
Control Delay	0.3	96.8	180.7	183.1
Queue Delay	4.2	0.0	3.5	22.9
Total Delay	4.5	96.8	184.2	206.0
Queue Length 50th (ft)	1	30	~399	~463
Queue Length 95th (ft)	m1	#93	#598	#675
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1356	59	314	356
Starvation Cap Reductn	832	0	0	0
Spillback Cap Reductn	0	0	2	14
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.66	1.26	1.32

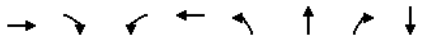
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	493	175	172	795	20	616
v/c Ratio	1.14	0.38	0.78	0.82	0.12	0.92
Control Delay	110.4	17.2	44.8	22.9	22.6	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.4	17.2	44.8	22.9	22.6	35.3
Queue Length 50th (ft)	~193	41	56	229	8	166
Queue Length 95th (ft)	#353	86	m#128	#523	m14	m#245
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	433	466	225	972	225	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.38	0.76	0.82	0.09	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



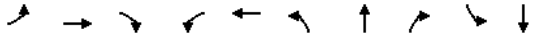
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	456	432	137	355	169	509
v/c Ratio	0.17	0.54	0.60	0.58	0.51	0.26	0.26	0.41
Control Delay	50.6	16.8	10.3	9.3	31.1	20.7	5.5	25.0
Queue Delay	0.0	0.2	1.3	1.1	0.0	0.0	0.3	0.0
Total Delay	50.6	17.1	11.7	10.4	31.1	20.7	5.8	25.0
Queue Length 50th (ft)	12	0	102	86	38	51	14	131
Queue Length 95th (ft)	35	52	162	144	m74	m82	m38	177
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	749	270	1358	661	1242
Starvation Cap Reductn	0	0	93	92	0	0	183	0
Spillback Cap Reductn	0	8	136	134	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47	0.74	0.70	0.51	0.26	0.35	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	155	36	499	686	283	389
v/c Ratio	0.53	0.05	0.65	0.48	0.30	0.90
Control Delay	26.8	1.0	37.4	2.3	20.5	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	1.0	37.4	2.3	20.5	26.2
Queue Length 50th (ft)	54	0	105	6	117	133
Queue Length 95th (ft)	101	4	128	17	228	227
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	866	1155	1422	936	571
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.04	0.43	0.48	0.30	0.68

Intersection Summary

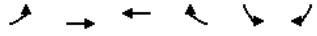


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	298	312	12	759	1480	283	668
v/c Ratio	0.59	1.20	0.22	0.80	0.83	0.13	0.90	0.93	0.85	0.81
Control Delay	46.2	152.3	28.4	42.4	43.7	47.4	46.6	13.4	48.8	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	152.3	28.4	42.4	43.7	47.4	46.6	13.4	48.8	32.5
Queue Length 50th (ft)	105	~307	22	178	189	7	240	0	165	321
Queue Length 95th (ft)	#193	#506	62	282	#315	26	#369	#122	#294	#653
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	308	324	292	443	446	242	879	1583	388	826
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.20	0.22	0.67	0.70	0.05	0.86	0.93	0.73	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1347	1247	960	361
v/c Ratio	0.46	0.49	0.99dr	0.89	0.91	0.52
Control Delay	45.6	5.8	21.3	19.4	45.0	8.1
Queue Delay	0.0	0.0	184.0	0.0	1.3	0.0
Total Delay	45.6	5.8	205.2	19.4	46.3	8.1
Queue Length 50th (ft)	95	87	~452	714	324	27
Queue Length 95th (ft)	160	134	m388	m634	#410	105
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2219	1388	1399	1124	723
Starvation Cap Reductn	0	0	441	0	0	0
Spillback Cap Reductn	0	9	0	0	54	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.49	1.42	0.89	0.90	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1187	1861	464	603	800	574
v/c Ratio	0.45	0.80	1.10	0.60	1.07	1.35	1.65
Control Delay	64.4	14.2	83.4	6.8	93.2	196.4	330.5
Queue Delay	0.0	9.4	157.5	0.4	29.9	37.9	83.4
Total Delay	64.4	23.6	240.9	7.1	123.1	234.3	413.9
Queue Length 50th (ft)	111	84	~584	42	~496	~752	~996
Queue Length 95th (ft)	m145	102	m#532	m36	#726	#1015	#961
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	592	347
Starvation Cap Reductn	0	182	108	58	0	0	0
Spillback Cap Reductn	0	282	410	0	37	35	35
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.98	1.46	0.65	1.14	1.44	1.84

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	399	1191	745	325	1274	241	72	76	66	419	812
v/c Ratio	0.75	1.17	1.05	1.19	1.20	0.48	0.34	0.35	0.25	0.85	0.67
Control Delay	55.2	113.8	48.5	151.6	134.1	33.4	49.6	49.9	25.2	48.7	10.4
Queue Delay	0.0	24.4	5.6	0.0	209.4	0.0	0.0	0.0	0.0	31.5	0.2
Total Delay	55.2	138.2	54.0	151.6	343.5	33.4	49.6	49.9	25.2	80.2	10.6
Queue Length 50th (ft)	149	~543	~268	~272	~564	140	57	61	19	291	159
Queue Length 95th (ft)	m144	m#463	m410	#469	#733	233	110	113	65	#445	128
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	501	214	217	259	493	1215
Starvation Cap Reductn	0	46	10	0	0	0	0	0	0	92	48
Spillback Cap Reductn	0	0	0	0	298	0	0	0	0	0	48
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	1.23	1.07	1.19	1.67	0.48	0.34	0.35	0.25	1.04	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1201	313
v/c Ratio	0.17	0.17	0.44	0.58	0.51
Control Delay	32.3	31.0	8.3	15.6	42.4
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	34.6	32.3	8.8	15.6	42.4
Queue Length 50th (ft)	62	65	81	262	228
Queue Length 95th (ft)	118	104	138	324	323
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1868	2069	610
Starvation Cap Reductn	351	750	576	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.64	0.58	0.51

Intersection Summary

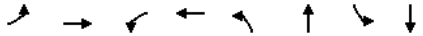
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1196	24	845	563	661	73	314	158
v/c Ratio	1.35	1.23	0.26	1.15	0.90	1.01	0.20	0.83	0.36
Control Delay	232.1	144.5	56.4	123.4	55.7	75.8	43.4	53.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	10.0	38.5	0.0	0.0	0.0
Total Delay	232.1	144.5	56.4	123.4	65.7	114.3	43.4	53.4	14.2
Queue Length 50th (ft)	~207	~564	17	~370	395	~509	49	216	16
Queue Length 95th (ft)	m#354	m#697	45	#498	#678	#818	m88	301	79
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	976	97	733	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	51	62	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.23	0.25	1.15	0.98	1.12	0.15	0.60	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

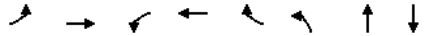


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	975	112	608	195	1592	118	1460
v/c Ratio	0.97	0.97	0.65	0.68	0.82	1.26	0.67	1.28
Control Delay	99.3	53.1	50.5	32.3	58.0	151.5	52.2	161.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	53.1	50.5	32.3	58.0	151.5	52.2	161.9
Queue Length 50th (ft)	110	282	61	154	108	~649	65	~601
Queue Length 95th (ft)	#243	#423	#118	212	#213	#786	#131	#737
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1010	197	978	256	1265	197	1141
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.97	0.57	0.62	0.76	1.26	0.60	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	959	166	795	113	245	540	711
v/c Ratio	0.31	1.19	1.34	0.82	0.23	0.51	1.10	1.45
Control Delay	50.1	130.1	234.7	43.4	7.4	35.4	106.5	241.8
Queue Delay	0.0	67.3	19.4	2.3	0.0	0.0	0.0	1.3
Total Delay	50.1	197.4	254.1	45.7	7.4	35.4	106.5	243.1
Queue Length 50th (ft)	21	~381	~139	263	0	132	~383	~626
Queue Length 95th (ft)	51	#510	#270	#392	43	210	#590	#852
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	809	124	975	500	478	489	492
Starvation Cap Reductn	0	92	0	85	0	0	0	0
Spillback Cap Reductn	0	14	4	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.34	1.38	0.89	0.23	0.51	1.10	1.45

Intersection Summary

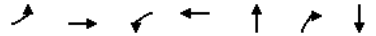
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1113	151	836	245	224	411	140	332	670
v/c Ratio	0.39	1.01	0.74	0.60	0.33	1.06	0.76	0.26	1.57	1.25
Control Delay	46.8	64.6	56.8	27.4	4.5	121.4	43.0	6.0	297.3	152.8
Queue Delay	0.0	95.9	0.0	5.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	160.4	56.8	32.7	5.0	121.4	43.0	6.0	297.3	152.8
Queue Length 50th (ft)	30	~410	93	232	0	~157	238	0	~306	~542
Queue Length 95th (ft)	64	#542	#173	314	52	#305	#362	44	m#369	m#598
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1102	230	1400	738	212	540	540	212	535
Starvation Cap Reductn	0	208	0	492	190	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.24	0.66	0.92	0.45	1.06	0.76	0.26	1.57	1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1483	166	1141	535	302	209
v/c Ratio	0.19	1.34	0.78	0.87	1.18	0.59	0.76
Control Delay	40.1	188.3	50.3	24.5	136.2	19.4	46.7
Queue Delay	0.0	130.7	0.0	7.2	0.0	4.0	4.9
Total Delay	40.1	318.9	50.3	31.7	136.2	23.4	51.6
Queue Length 50th (ft)	19	~644	95	~408	~411	71	126
Queue Length 95th (ft)	48	#903	m53	m#281	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1108	301	1305	454	515	348
Starvation Cap Reductn	0	198	0	137	0	0	0
Spillback Cap Reductn	0	80	0	0	0	138	84
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.63	0.55	0.98	1.18	0.80	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1357	49	825	561	1431	298	1634
v/c Ratio	0.95	1.33	0.51	1.22	1.26	1.09	1.20	1.23
Control Delay	38.3	178.1	57.1	146.2	170.6	86.3	159.0	138.0
Queue Delay	2.1	22.4	0.0	6.5	0.0	1.8	0.0	21.3
Total Delay	40.5	200.6	57.1	152.6	170.6	88.1	159.0	159.3
Queue Length 50th (ft)	122	~570	32	~335	~232	~547	~232	~682
Queue Length 95th (ft)	m77	m#394	m67	m#434	#339	#685	#396	#823
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1019	106	674	446	1307	249	1333
Starvation Cap Reductn	0	37	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.38	0.46	1.24	1.26	1.10	1.20	1.27

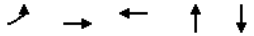
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1062	47	804	440	485
v/c Ratio	0.25	0.53	0.26	0.41	0.66	0.86
Control Delay	20.6	11.5	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	11.5	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	164	13	43	50	52
Queue Length 95th (ft)	m17	m153	36	128	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1987	248	1957	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.53	0.19	0.41	0.64	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

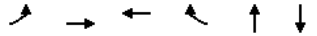


Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	563	112	349	160	780
v/c Ratio	1.10	0.13	1.09	0.21	1.02
Control Delay	90.7	13.6	110.1	12.2	57.7
Queue Delay	0.0	0.0	0.0	0.0	15.2
Total Delay	90.7	13.6	110.1	12.2	72.9
Queue Length 50th (ft)	~291	33	~209	40	~386
Queue Length 95th (ft)	#494	64	#380	79	#642
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	751	768
Starvation Cap Reductn	0	0	0	0	33
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.10	0.13	1.09	0.21	1.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1794	2022
v/c Ratio	1.11	0.74	0.91	1.02
Control Delay	117.3	47.0	29.2	50.8
Queue Delay	0.0	0.0	16.1	0.0
Total Delay	117.3	47.0	45.3	50.8
Queue Length 50th (ft)	~206	130	545	~774
Queue Length 95th (ft)	#315	180	#757	#930
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1976	1974
Starvation Cap Reductn	0	0	225	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.02	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1212	1947
v/c Ratio	0.62	1.58	0.78	0.63
Control Delay	30.2	292.8	17.5	12.2
Queue Delay	1.0	0.0	62.1	2.3
Total Delay	31.3	292.8	79.6	14.5
Queue Length 50th (ft)	168	~660	245	232
Queue Length 95th (ft)	227	#889	338	278
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	536	1555	3103
Starvation Cap Reductn	0	0	484	0
Spillback Cap Reductn	186	0	0	978
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	1.58	1.13	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1207	976	1055
v/c Ratio	1.14	0.97	1.01	0.44
Control Delay	113.0	54.1	71.1	9.1
Queue Delay	82.7	155.6	248.3	11.3
Total Delay	195.7	209.7	319.4	20.4
Queue Length 50th (ft)	~441	434	~360	164
Queue Length 95th (ft)	#573	#586	#500	205
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1307
Spillback Cap Reductn	127	359	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.32	1.36	1.59	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	82	64	147	351	710	98	627
v/c Ratio	0.52	0.38	0.27	0.57	1.02	0.79	0.69
Control Delay	52.0	43.8	14.8	6.3	73.5	91.1	27.6
Queue Delay	0.0	0.0	6.7	2.6	0.0	0.0	0.0
Total Delay	52.0	43.8	21.5	8.9	73.5	91.1	27.6
Queue Length 50th (ft)	59	38	28	0	~559	73	348
Queue Length 95th (ft)	111	82	m52	m0	#838	#175	525
Internal Link Dist (ft)		493		63	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	314	328	564	629	697	126	910
Starvation Cap Reductn	0	0	364	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.20	0.74	0.76	1.02	0.78	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1005: 65th Street & Overland Avenue 2030 Plus Alt#2 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	122	47	87	262
v/c Ratio	0.09	0.77	0.44	0.88
Control Delay	0.1	100.9	54.6	69.0
Queue Delay	3.4	0.0	0.0	0.0
Total Delay	3.4	100.9	54.7	69.0
Queue Length 50th (ft)	0	34	61	189
Queue Length 95th (ft)	m0	#107	117	#352
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1381	66	215	314
Starvation Cap Reductn	1169	0	0	0
Spillback Cap Reductn	0	0	1	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.71	0.41	0.83

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1009: Shellmound Way & Christie Ave 2030 Plus Alt#2 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	538	502	155	313	322	511
v/c Ratio	0.14	0.34	0.94	0.89	0.75	0.27	0.46	0.48
Control Delay	35.6	13.5	37.6	31.3	40.5	16.6	2.5	30.9
Queue Delay	0.0	0.4	54.2	33.6	0.0	0.0	1.0	0.1
Total Delay	35.6	13.8	91.8	64.9	40.5	16.6	3.5	30.9
Queue Length 50th (ft)	33	21	386	354	38	38	1	149
Queue Length 95th (ft)	69	76	#610	#551	m#184	m61	m16	202
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	439	596	588	207	1161	705	1060
Starvation Cap Reductn	0	0	97	92	0	0	186	0
Spillback Cap Reductn	0	70	114	112	0	0	0	59
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.40	1.12	1.05	0.75	0.27	0.62	0.51

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St

2030 Plus Alt#2 SAT

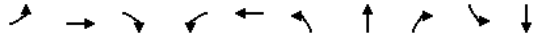
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	283	73	751	929	386	305
v/c Ratio	0.80	0.09	0.84	0.69	0.48	0.28
Control Delay	32.3	1.5	22.1	21.1	27.5	7.1
Queue Delay	0.1	0.0	0.4	1.8	0.0	0.0
Total Delay	32.4	1.5	22.5	23.0	27.5	7.1
Queue Length 50th (ft)	184	7	213	690	197	61
Queue Length 95th (ft)	255	11	m243	m778	350	127
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	945	1186	1356	806	1203
Starvation Cap Reductn	11	0	0	264	0	0
Spillback Cap Reductn	0	0	124	0	0	7
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.08	0.71	0.85	0.48	0.26

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd

2030 Plus Alt#2 SAT



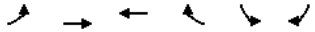
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	452	440	45	357	1196	147	544
v/c Ratio	0.22	0.17	0.07	0.76	0.74	0.32	0.34	0.76	0.63	0.79
Control Delay	35.9	35.6	20.7	34.1	32.7	35.7	23.5	3.4	33.3	31.7
Queue Delay	0.0	0.0	0.0	2.4	1.9	0.0	0.0	0.0	0.0	1.6
Total Delay	35.9	35.6	20.7	36.5	34.6	35.7	23.5	3.4	33.3	33.2
Queue Length 50th (ft)	13	11	0	215	206	21	73	0	69	246
Queue Length 95th (ft)	39	34	13	#421	#405	54	124	0	126	#470
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	596	306	1136	1583	431	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	17	61	61	0	0	0	0	65
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.85	0.82	0.15	0.31	0.76	0.34	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

2030 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	820	1117	1110	282
v/c Ratio	0.68	0.19	0.60	0.80	0.88	0.38
Control Delay	51.4	13.0	19.5	19.6	34.4	4.3
Queue Delay	0.0	0.0	8.0	0.0	103.7	0.0
Total Delay	51.4	13.0	27.6	19.6	138.0	4.3
Queue Length 50th (ft)	87	61	248	608	373	10
Queue Length 95th (ft)	143	106	m312	m763	397	57
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1953	1376	1399	1592	873
Starvation Cap Reductn	0	0	513	0	283	0
Spillback Cap Reductn	0	2	0	0	686	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.19	0.95	0.80	1.23	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp

2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1311	1473	495	464	756	733
v/c Ratio	0.77	1.10	0.89	0.59	0.63	0.95	1.87
Control Delay	69.1	78.1	42.3	7.8	28.9	41.7	424.5
Queue Delay	0.0	200.0	10.5	0.2	0.4	54.7	267.1
Total Delay	69.1	278.0	52.8	8.0	29.3	96.5	691.6
Queue Length 50th (ft)	76	~395	374	31	262	392	~881
Queue Length 95th (ft)	m129	#487	#508	m120	382	#704	#1277
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	838	734	794	391
Starvation Cap Reductn	0	267	92	50	0	0	0
Spillback Cap Reductn	0	349	182	0	47	124	94
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.55	1.00	0.63	0.68	1.13	2.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	420	1538	827	380	816	247	153	161	110	556	898
v/c Ratio	0.71	1.46	1.36	1.39	0.77	0.48	0.84	0.86	0.42	1.12	0.69
Control Delay	53.4	235.0	186.0	231.4	40.8	23.6	91.5	93.8	26.5	104.1	11.0
Queue Delay	0.0	19.1	2.0	0.0	0.5	0.0	0.0	0.0	0.0	91.9	3.6
Total Delay	53.4	254.0	188.1	231.4	41.3	23.6	91.5	93.8	26.5	196.0	14.6
Queue Length 50th (ft)	152	~791	~777	~358	275	91	121	127	25	~439	69
Queue Length 95th (ft)	m128	m#603	m#538	#545	350	169	m#235	m#249	m69	m#592	m193
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	606	274	1062	517	183	188	261	496	1293
Starvation Cap Reductn	0	30	2	0	0	0	0	0	0	79	298
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	134
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.50	1.37	1.39	0.81	0.48	0.84	0.86	0.42	1.33	0.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1682	451
v/c Ratio	0.22	0.22	0.83	0.90	0.53
Control Delay	23.5	23.1	28.4	19.5	17.1
Queue Delay	1.2	0.7	2.2	0.5	0.0
Total Delay	24.6	23.7	30.6	20.0	17.1
Queue Length 50th (ft)	79	82	312	596	275
Queue Length 95th (ft)	127	114	370	148	212
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	54	112	0	28	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.92	0.53

Intersection Summary

Queues
1016: Powell St & Hollis Street

2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1112	43	840	305	337	40	308	107
v/c Ratio	1.00	1.01	0.41	0.96	0.77	0.81	0.10	0.76	0.25
Control Delay	126.5	57.5	43.3	49.3	35.2	36.5	21.2	33.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	57.5	43.3	49.3	35.2	36.5	21.2	33.4	6.7
Queue Length 50th (ft)	~52	~294	18	~187	118	130	13	118	0
Queue Length 95th (ft)	#142	#413	#51	#307	#227	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	110	1096	104	876	428	449	425	448	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.01	0.41	0.96	0.71	0.75	0.09	0.69	0.24

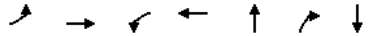
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

2030 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1566	190	1447	469	238	79
v/c Ratio	0.34	1.17	1.19	0.84	1.06	0.48	0.31
Control Delay	58.4	111.3	129.3	21.9	97.0	16.0	30.5
Queue Delay	0.0	148.2	0.0	98.9	0.0	0.1	0.0
Total Delay	58.4	259.6	129.3	120.8	97.0	16.1	30.5
Queue Length 50th (ft)	11	~587	~144	333	~330	45	42
Queue Length 95th (ft)	m27	#922	m#117	m#491	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	525	0	0	0
Spillback Cap Reductn	0	294	0	0	0	12	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.51	1.19	1.22	1.06	0.49	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1342	78	836	663	1232	170	1504
v/c Ratio	0.90	1.22	0.76	1.02	1.21	1.00	0.80	1.43
Control Delay	60.8	113.6	84.2	74.9	147.2	59.5	59.7	226.9
Queue Delay	0.0	35.5	0.0	52.8	347.6	0.0	0.0	1.2
Total Delay	60.8	149.1	84.2	127.7	494.9	59.5	59.7	228.1
Queue Length 50th (ft)	114	~539	50	~303	~267	~451	105	~687
Queue Length 95th (ft)	m138	m#428	#128	#427	#378	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1104	106	819	549	1232	239	1054
Starvation Cap Reductn	0	68	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	96	215	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.30	0.74	1.16	1.99	1.00	0.71	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #3
BASE YEAR

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1174	111	692	95	236	64	199	202
v/c Ratio	0.97	0.67	0.64	0.68	0.51	0.62	0.25	0.74	0.50
Control Delay	68.2	22.7	46.7	54.0	50.1	44.9	42.2	53.3	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	22.7	46.7	54.0	50.1	44.9	42.2	53.3	9.2
Queue Length 50th (ft)	375	308	77	271	65	76	40	135	0
Queue Length 95th (ft)	#596	433	m130	#353	115	114	79	210	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1752	193	1024	257	520	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.67	0.58	0.68	0.37	0.45	0.21	0.62	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	738	141	603	123	793
v/c Ratio	0.47	0.77	0.88	0.67	0.40	0.48	0.50
Control Delay	17.6	19.0	36.4	54.1	24.0	50.1	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	19.0	36.4	54.1	24.0	50.1	24.4
Queue Length 50th (ft)	17	152	252	96	148	81	200
Queue Length 95th (ft)	m20	85	288	160	231	141	314
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	219	1522	1131	257	1489	257	1571
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.57	0.65	0.55	0.40	0.48	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	103	39	309	25	472
v/c Ratio	0.72	0.36	0.20	0.28	0.14	0.46
Control Delay	25.7	20.9	18.7	8.0	21.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	20.9	18.7	8.0	21.0	10.0
Queue Length 50th (ft)	51	25	11	28	7	51
Queue Length 95th (ft)	#148	61	31	131	24	177
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	392	285	283	1109	283	1022
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.36	0.14	0.28	0.09	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

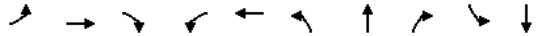
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	348	366	166	422
v/c Ratio	0.22	0.22	0.20	0.28
Control Delay	7.1	3.2	1.7	17.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.1	3.2	1.7	17.3
Queue Length 50th (ft)	21	4	0	84
Queue Length 95th (ft)	38	3	m0	118
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1577	1628	818	1519
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.22	0.20	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	120	16	242	195	97	158
v/c Ratio	0.58	0.03	0.52	0.13	0.08	0.49
Control Delay	44.3	28.6	40.6	0.4	9.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	28.6	40.6	0.4	9.9	8.6
Queue Length 50th (ft)	82	2	58	3	21	0
Queue Length 95th (ft)	142	23	45	4	57	55
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	826	1236	1496	1169	457
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.02	0.20	0.13	0.08	0.35

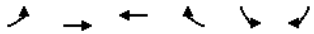
Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	347	366	96	45	767	65	322
v/c Ratio	0.03	0.12	0.10	0.62	0.65	0.42	0.04	0.48	0.31	0.60
Control Delay	35.4	35.5	18.2	23.5	23.9	31.9	18.5	1.1	32.4	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	35.5	18.2	23.5	23.9	31.9	18.5	1.1	32.4	21.7
Queue Length 50th (ft)	2	9	0	123	130	36	6	0	24	108
Queue Length 95th (ft)	14	36	20	#286	#322	95	20	0	71	224
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	440	463	406	739	749	428	1486	1583	541	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.47	0.49	0.22	0.03	0.48	0.12	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	899	734	139
v/c Ratio	0.38	0.19	0.50	0.62	0.84	0.28
Control Delay	39.3	4.0	17.6	7.1	36.5	5.2
Queue Delay	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	39.3	4.0	18.1	7.1	36.5	5.2
Queue Length 50th (ft)	72	25	108	260	230	0
Queue Length 95th (ft)	129	53	m147	m378	271	42
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2263	1481	1441	1373	717
Starvation Cap Reductn	0	0	325	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.64	0.62	0.53	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	889	998	326	533	636	624
v/c Ratio	0.25	0.37	0.67	0.45	0.84	0.97	0.86
Control Delay	21.0	9.6	20.3	3.0	41.5	53.4	36.1
Queue Delay	0.0	1.4	0.1	0.0	0.0	0.8	0.1
Total Delay	21.0	11.0	20.4	3.0	41.5	54.1	36.2
Queue Length 50th (ft)	14	149	121	3	318	351	322
Queue Length 95th (ft)	m43	138	151	18	#513	#620	#557
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	321	2390	1484	728	639	655	715
Starvation Cap Reductn	0	1227	0	0	0	0	0
Spillback Cap Reductn	0	98	29	0	0	3	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.69	0.45	0.83	0.98	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	492	1201	347	49	647	103	24	25	46	156	646
v/c Ratio	0.71	0.85	0.38	0.38	0.68	0.23	0.21	0.22	0.30	0.29	0.43
Control Delay	48.4	21.7	1.5	38.9	26.1	13.5	44.7	44.8	15.4	33.6	9.7
Queue Delay	0.0	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	23.4	1.6	38.9	26.1	13.5	44.7	44.8	15.4	33.6	9.7
Queue Length 50th (ft)	164	263	8	29	111	19	15	15	0	89	65
Queue Length 95th (ft)	m200	m#518	m13	m47	142	m41	42	43	34	145	106
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	692	1408	914	142	956	452	185	186	215	540	1518
Starvation Cap Reductn	0	92	123	0	0	0	0	0	0	0	78
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.91	0.44	0.35	0.68	0.23	0.13	0.13	0.21	0.29	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	406	118
v/c Ratio	0.03	0.03	0.14	0.08	0.22	0.26	0.18
Control Delay	19.4	19.0	2.4	45.0	19.4	18.1	34.8
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.1	34.8
Queue Length 50th (ft)	8	9	0	4	0	83	74
Queue Length 95th (ft)	26	22	21	19	24	116	125
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1553	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.26	0.18

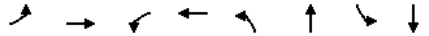
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	634	37	492	248	216	28	153	101
v/c Ratio	0.73	0.37	0.28	0.61	0.78	0.65	0.12	0.63	0.34
Control Delay	28.9	10.7	46.6	37.0	44.2	39.4	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	10.7	46.6	37.0	44.2	39.4	31.3	38.9	9.9
Queue Length 50th (ft)	233	114	22	143	155	127	16	95	0
Queue Length 95th (ft)	m#432	m225	54	198	235	200	29	100	39
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	532	1724	159	810	409	428	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.37	0.23	0.61	0.61	0.50	0.08	0.39	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

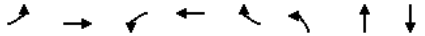
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	294	97	427	112	548	53	702
v/c Ratio	0.63	0.53	0.59	0.71	0.61	0.28	0.41	0.39
Control Delay	65.8	29.6	50.0	39.4	45.6	13.4	45.9	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	29.6	50.0	39.4	45.6	13.4	45.9	16.9
Queue Length 50th (ft)	47	66	60	134	69	94	33	140
Queue Length 95th (ft)	#108	107	111	177	120	152	70	222
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	902	212	1058	301	1977	230	1817
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.46	0.40	0.37	0.28	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



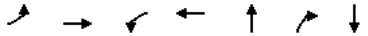
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	246	47	327	66	67	91	38
v/c Ratio	0.25	0.12	0.38	0.15	0.07	0.38	0.46	0.16
Control Delay	48.0	10.8	50.1	11.3	4.6	43.1	31.3	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	10.8	50.1	11.3	4.6	43.1	31.3	28.6
Queue Length 50th (ft)	16	28	29	33	0	41	38	17
Queue Length 95th (ft)	42	75	64	106	26	82	87	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1984	140	2145	986	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.12	0.34	0.15	0.07	0.14	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	212	55	404	183	134	241	42	76	145
v/c Ratio	0.28	0.13	0.42	0.22	0.20	0.67	0.57	0.13	0.59	0.42
Control Delay	46.9	15.4	48.9	17.2	4.2	48.6	34.4	9.0	62.2	31.7
Queue Delay	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.4	48.9	17.7	4.7	48.6	34.4	9.0	62.2	31.7
Queue Length 50th (ft)	19	27	34	66	0	83	150	0	50	88
Queue Length 95th (ft)	47	70	71	142	46	140	181	25	#103	93
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1679	164	1825	905	266	671	489	142	537
Starvation Cap Reductn	0	0	0	955	398	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.34	0.46	0.36	0.50	0.36	0.09	0.54	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

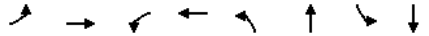


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	311	75	580	164	120	37
v/c Ratio	0.04	0.17	0.53	0.28	0.87	0.28	0.26
Control Delay	47.3	17.8	49.9	8.2	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.8	49.9	8.4	52.9	6.6	37.5
Queue Length 50th (ft)	2	56	43	22	99	0	21
Queue Length 95th (ft)	11	120	m90	187	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1803	195	2098	237	515	323
Starvation Cap Reductn	0	0	0	696	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.38	0.41	0.69	0.23	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	316	32	477	260	785	147	795
v/c Ratio	0.62	0.51	0.18	0.78	0.54	0.45	0.73	0.49
Control Delay	60.1	39.6	47.1	43.0	44.7	20.7	47.6	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	39.6	47.1	43.0	44.7	20.7	47.6	21.6
Queue Length 50th (ft)	45	42	18	108	80	183	92	194
Queue Length 95th (ft)	122	141	m49	188	121	290	149	279
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1024	190	761	481	1731	301	1629
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.31	0.17	0.63	0.54	0.45	0.49	0.49

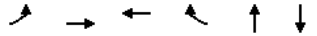
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	337	7	481	145	318
v/c Ratio	0.27	0.15	0.05	0.23	0.27	0.60
Control Delay	12.5	5.8	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	5.8	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	46	2	21	16	36
Queue Length 95th (ft)	m24	88	11	67	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2249	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.23	0.24	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1021	860
v/c Ratio	0.57	0.58	0.44	0.37
Control Delay	46.2	43.7	9.8	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.8	9.0
Queue Length 50th (ft)	58	76	154	120
Queue Length 95th (ft)	92	112	238	188
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.44	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	485	757
v/c Ratio	0.35	0.96	0.25	0.25
Control Delay	25.8	30.5	10.8	10.4
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	25.8	30.5	11.4	10.4
Queue Length 50th (ft)	92	236	81	87
Queue Length 95th (ft)	130	#487	111	112
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1298	812	1978	3052
Starvation Cap Reductn	0	0	1091	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.89	0.55	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	524	240	540
v/c Ratio	0.51	0.27	0.48	0.20
Control Delay	22.3	8.9	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	8.9	28.9	3.2
Queue Length 50th (ft)	41	53	50	25
Queue Length 95th (ft)	71	96	78	45
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1950	638	2689
Starvation Cap Reductn	0	0	0	1596
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.38	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	813	114	867	185	569	141	284	501
v/c Ratio	0.87	0.60	0.61	0.80	0.59	0.90	0.44	0.84	0.83
Control Delay	61.6	29.1	68.0	28.1	47.9	56.2	43.1	57.2	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	29.1	68.0	28.1	47.9	56.2	43.1	57.2	20.8
Queue Length 50th (ft)	194	239	77	290	129	205	87	191	71
Queue Length 95th (ft)	#330	317	m111	#433	m179	m#279	149	#313	#246
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1362	225	1090	322	646	354	373	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.60	0.51	0.80	0.57	0.88	0.40	0.76	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	863	187	1093	197	994
v/c Ratio	0.78	0.69	0.89	0.76	0.74	0.82	0.68
Control Delay	46.6	32.2	35.9	58.7	32.2	72.7	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	32.2	35.9	58.7	32.2	72.7	30.9
Queue Length 50th (ft)	76	300	296	126	328	137	295
Queue Length 95th (ft)	m118	m333	318	#217	#545	#258	#490
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	173	1518	1249	274	1469	241	1457
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.53	0.69	0.68	0.74	0.82	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	425	184	177	699	21	505
v/c Ratio	1.00	0.39	0.80	0.72	0.12	0.76
Control Delay	66.2	17.4	45.7	18.3	22.5	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	17.4	45.7	18.3	22.5	22.6
Queue Length 50th (ft)	132	44	58	191	8	116
Queue Length 95th (ft)	#295	90	m#127	#444	m16	174
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	427	475	225	972	225	666
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.39	0.79	0.72	0.09	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	774	525	251	678
v/c Ratio	0.48	0.33	0.31	0.46
Control Delay	9.0	2.8	0.7	21.9
Queue Delay	1.2	0.6	1.0	0.0
Total Delay	10.2	3.4	1.6	21.9
Queue Length 50th (ft)	157	13	0	168
Queue Length 95th (ft)	98	m11	m0	220
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1610	1609	813	1481
Starvation Cap Reductn	575	679	340	0
Spillback Cap Reductn	180	0	0	23
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.56	0.53	0.47

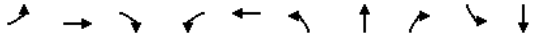
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	233	37	513	704	251	261
v/c Ratio	0.75	0.05	0.58	0.50	0.29	0.64
Control Delay	24.5	0.1	22.5	3.4	21.8	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	0.1	22.5	3.4	21.8	19.5
Queue Length 50th (ft)	62	0	64	28	109	68
Queue Length 95th (ft)	103	m0	80	505	196	147
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	883	1155	1402	857	533
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.04	0.44	0.50	0.29	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

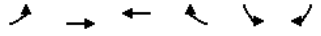


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	270	285	12	705	1349	274	625
v/c Ratio	0.58	1.18	0.21	0.76	0.80	0.13	0.85	0.85	0.84	0.77
Control Delay	44.6	143.4	28.1	39.2	40.2	47.0	40.5	6.5	45.3	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	143.4	28.1	39.2	40.2	47.0	40.5	6.5	45.3	29.4
Queue Length 50th (ft)	103	~304	22	156	166	7	206	0	153	273
Queue Length 95th (ft)	#202	#524	64	254	268	26	#328	0	#281	#589
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	323	340	306	453	456	251	904	1583	402	820
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.18	0.21	0.60	0.63	0.05	0.78	0.85	0.68	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1221	1152	865	359
v/c Ratio	0.47	0.46	0.86	0.82	0.87	0.51
Control Delay	45.8	4.9	15.6	16.6	41.9	6.3
Queue Delay	0.0	0.0	154.6	0.0	0.4	0.0
Total Delay	45.8	4.9	170.2	16.6	42.3	6.3
Queue Length 50th (ft)	97	65	375	643	296	11
Queue Length 95th (ft)	163	117	m358	m579	357	79
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2273	1427	1399	1124	745
Starvation Cap Reductn	0	0	518	0	0	0
Spillback Cap Reductn	0	8	0	0	44	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.46	1.34	0.82	0.80	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1140	1775	516	598	744	498
v/c Ratio	0.45	0.77	1.05	0.69	1.06	1.28	1.43
Control Delay	65.3	13.4	64.7	10.3	90.5	168.8	232.9
Queue Delay	0.0	2.1	127.5	0.5	8.6	2.0	0.0
Total Delay	65.3	15.5	192.2	10.8	99.1	170.7	232.9
Queue Length 50th (ft)	111	73	~538	66	~488	~684	~798
Queue Length 95th (ft)	m156	100	m#589	m75	#716	#942	#1150
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	753	565	580	349
Starvation Cap Reductn	0	212	115	49	0	0	0
Spillback Cap Reductn	0	89	366	0	12	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.89	1.34	0.73	1.08	1.29	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	576	925	636	282	1075	223	78	82	72	406	948
v/c Ratio	1.08	0.92	0.90	1.03	1.01	0.44	0.36	0.38	0.27	0.82	0.78
Control Delay	94.7	39.2	19.9	108.6	69.5	28.4	50.2	50.5	24.8	42.7	12.0
Queue Delay	0.0	3.6	1.7	0.0	165.7	0.0	0.0	0.0	0.0	26.6	0.4
Total Delay	94.7	42.8	21.6	108.6	235.2	28.4	50.2	50.5	24.8	69.3	12.4
Queue Length 50th (ft)	~238	283	293	~214	~408	103	63	66	20	253	59
Queue Length 95th (ft)	m#246	m299	m336	#382	#554	177	116	121	68	#429	107
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	504	214	217	264	494	1208
Starvation Cap Reductn	0	42	18	0	0	0	0	0	0	98	32
Spillback Cap Reductn	0	0	0	0	296	0	0	0	0	0	43
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.96	0.93	1.03	1.40	0.44	0.36	0.38	0.27	1.03	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1059	288
v/c Ratio	0.13	0.12	0.45	0.42	0.51	0.66	0.43
Control Delay	30.4	29.2	6.0	50.5	12.6	25.8	44.2
Queue Delay	1.3	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	31.7	29.2	6.7	50.5	12.6	25.8	44.2
Queue Length 50th (ft)	51	50	0	35	0	297	209
Queue Length 95th (ft)	102	82	138	73	52	371	295
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1725	241	307	1603	668
Starvation Cap Reductn	377	0	575	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.67	0.21	0.34	0.66	0.43

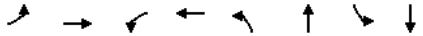
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	901	22	683	551	484	63	215	170
v/c Ratio	1.14	0.87	0.24	0.93	0.75	0.63	0.25	0.82	0.47
Control Delay	160.0	46.6	55.7	63.5	36.0	31.2	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	6.6	2.7	0.0	0.0	0.0
Total Delay	160.0	46.6	55.7	63.5	42.7	33.8	43.8	49.2	12.1
Queue Length 50th (ft)	~153	292	15	248	297	249	39	134	3
Queue Length 95th (ft)	#295	#490	42	#363	#569	457	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1040	97	731	732	763	499	525	556
Starvation Cap Reductn	0	0	0	0	136	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.87	0.23	0.93	0.92	0.82	0.13	0.41	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

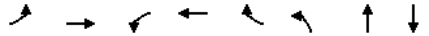


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	826	109	477	152	1189	122	1053
v/c Ratio	0.76	0.85	0.64	0.55	0.71	0.91	0.69	0.85
Control Delay	59.5	38.4	49.9	29.5	47.6	40.4	53.4	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	38.4	49.9	29.5	47.6	40.4	53.4	37.5
Queue Length 50th (ft)	78	220	60	114	83	~386	67	307
Queue Length 95th (ft)	#165	#317	113	161	145	#520	#137	#467
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	981	197	977	256	1308	197	1234
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.84	0.55	0.49	0.59	0.91	0.62	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	869	87	651	29	234	232	182
v/c Ratio	0.25	0.57	0.57	0.36	0.04	0.76	0.69	0.65
Control Delay	48.1	25.4	57.5	20.0	9.9	41.8	32.3	39.3
Queue Delay	0.0	1.5	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	48.1	26.9	57.5	20.6	9.9	41.8	32.3	39.3
Queue Length 50th (ft)	16	201	53	105	0	145	111	109
Queue Length 95th (ft)	42	#438	#120	273	23	203	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1533	158	1797	784	478	492	492
Starvation Cap Reductn	0	444	0	748	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.80	0.55	0.62	0.04	0.49	0.47	0.37

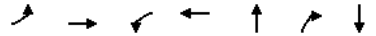
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	726	153	541	196	208	299	125	192	384
v/c Ratio	0.39	0.57	0.74	0.35	0.26	0.98	0.69	0.28	0.91	0.90
Control Delay	46.8	27.7	56.3	22.0	4.5	102.9	38.3	6.2	84.2	42.4
Queue Delay	0.0	1.1	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.9	56.3	22.8	4.9	102.9	38.3	6.2	84.2	42.4
Queue Length 50th (ft)	31	190	94	123	0	134	173	0	125	237
Queue Length 95th (ft)	67	273	#177	192	48	#279	247	42	#256	287
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1284	234	1531	757	212	540	530	212	531
Starvation Cap Reductn	0	321	0	647	240	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.65	0.61	0.38	0.98	0.55	0.24	0.91	0.72

Intersection Summary

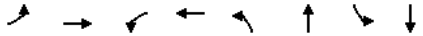
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	945	135	859	328	255	191
v/c Ratio	0.18	0.72	0.70	0.59	0.86	0.50	0.71
Control Delay	40.0	33.4	52.2	18.6	47.6	8.6	45.0
Queue Delay	0.0	13.0	0.0	0.4	0.0	0.0	0.0
Total Delay	40.0	46.4	52.2	19.0	47.6	8.6	45.0
Queue Length 50th (ft)	19	266	91	110	201	12	115
Queue Length 95th (ft)	47	#486	m54	m#288	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1305	301	1454	452	562	348
Starvation Cap Reductn	0	352	0	188	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.99	0.45	0.68	0.73	0.45	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	900	50	591	457	1051	241	1163
v/c Ratio	0.92	0.91	0.52	0.92	1.02	0.78	0.95	0.85
Control Delay	57.3	36.5	61.3	48.9	92.9	32.6	90.0	34.9
Queue Delay	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	57.3	38.9	61.3	48.9	92.9	32.6	90.0	35.8
Queue Length 50th (ft)	143	74	33	184	~160	311	155	353
Queue Length 95th (ft)	m#239	#357	m71	#251	#259	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	251	986	106	678	446	1345	253	1373
Starvation Cap Reductn	0	34	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.95	0.47	0.87	1.02	0.78	0.95	0.89

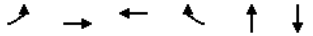
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	725	10	596	276	377
v/c Ratio	0.10	0.33	0.07	0.27	0.49	0.66
Control Delay	20.7	6.4	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	6.4	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	96	3	27	35	36
Queue Length 95th (ft)	m7	m113	14	81	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2219	248	2177	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.04	0.27	0.43	0.59

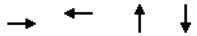
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1293	1431
v/c Ratio	0.69	0.63	0.60	0.66
Control Delay	46.8	43.3	14.4	15.7
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.8	15.7
Queue Length 50th (ft)	90	88	255	302
Queue Length 95th (ft)	131	127	380	447
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2171	2165
Starvation Cap Reductn	0	0	393	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.73	0.66

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	921	1335
v/c Ratio	0.31	1.02	0.47	0.43
Control Delay	25.4	67.5	10.6	9.7
Queue Delay	0.1	0.0	5.4	0.1
Total Delay	25.5	67.5	16.0	9.8
Queue Length 50th (ft)	75	~282	137	133
Queue Length 95th (ft)	111	#502	181	163
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	585	1946	3103
Starvation Cap Reductn	0	0	950	0
Spillback Cap Reductn	148	0	0	563
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.02	0.92	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	949	643	778
v/c Ratio	0.82	0.61	0.82	0.31
Control Delay	44.3	26.5	43.5	6.6
Queue Delay	0.3	0.8	12.7	1.9
Total Delay	44.6	27.3	56.2	8.5
Queue Length 50th (ft)	216	261	223	95
Queue Length 95th (ft)	272	385	270	140
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1526
Spillback Cap Reductn	36	313	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.76	0.97	0.79

Intersection Summary

Queues
1009: Shellmound Way & Christie Ave
Existing Plus Alt#3 SAT

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	1001	541	448	705
v/c Ratio	0.58	0.37	0.53	0.52
Control Delay	7.1	12.6	8.2	25.5
Queue Delay	1.8	1.5	5.8	0.1
Total Delay	8.9	14.1	14.1	25.6
Queue Length 50th (ft)	53	147	238	191
Queue Length 95th (ft)	66	m122	m221	247
Internal Link Dist (ft)	342	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1732	1480	850	1357
Starvation Cap Reductn	536	720	337	0
Spillback Cap Reductn	384	0	25	108
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.71	0.87	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St
Existing Plus Alt#3 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	403	55	717	942	308	301
v/c Ratio	0.89	0.06	0.81	0.75	0.44	0.28
Control Delay	27.5	0.1	17.2	20.8	30.1	6.8
Queue Delay	0.9	0.0	0.0	2.9	0.0	0.0
Total Delay	28.3	0.1	17.2	23.7	30.1	6.8
Queue Length 50th (ft)	86	0	190	661	164	56
Queue Length 95th (ft)	#398	m0	m201	m776	276	118
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1018	1186	1252	704	1122
Starvation Cap Reductn	15	0	0	203	0	0
Spillback Cap Reductn	0	0	9	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.05	0.61	0.90	0.44	0.27

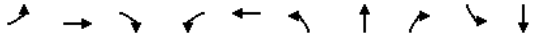
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#3 SAT



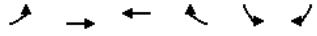
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	465	452	45	282	1146	130	479
v/c Ratio	0.21	0.16	0.06	0.71	0.69	0.30	0.31	0.72	0.58	0.80
Control Delay	35.8	35.5	20.7	31.0	29.8	35.3	23.1	2.9	32.6	28.5
Queue Delay	0.0	0.0	0.0	1.2	1.0	0.0	0.0	0.0	0.0	0.7
Total Delay	35.8	35.5	20.7	32.2	30.8	35.3	23.1	2.9	32.6	29.1
Queue Length 50th (ft)	13	11	0	223	213	21	55	0	61	206
Queue Length 95th (ft)	39	34	13	#436	#422	54	97	0	115	#388
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	343	361	313	655	657	327	1119	1583	455	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	15	62	62	0	0	0	0	62
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.78	0.76	0.14	0.25	0.72	0.29	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	749	998	1088	263
v/c Ratio	0.68	0.15	0.53	0.71	0.88	0.36
Control Delay	51.4	12.5	18.0	15.6	35.0	4.3
Queue Delay	0.0	0.0	2.9	0.0	7.9	0.0
Total Delay	51.4	12.5	20.9	15.6	42.9	4.3
Queue Length 50th (ft)	85	49	220	518	367	8
Queue Length 95th (ft)	141	84	302	674	400	54
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2012	1415	1399	1592	866
Starvation Cap Reductn	0	0	535	0	261	0
Spillback Cap Reductn	0	0	0	0	465	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.15	0.85	0.71	0.97	0.30

Intersection Summary

Queues
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1264	1342	477	404	602	579
v/c Ratio	0.74	1.06	0.80	0.57	0.55	0.76	1.48
Control Delay	67.5	63.2	30.5	5.3	26.5	20.1	251.3
Queue Delay	0.0	143.9	0.8	0.2	0.3	0.0	0.0
Total Delay	67.5	207.1	31.3	5.5	26.9	20.1	251.3
Queue Length 50th (ft)	69	~369	337	38	217	207	~962
Queue Length 95th (ft)	m115	#446	404	m61	320	382	#859
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1678	832	734	795	392
Starvation Cap Reductn	0	285	119	51	0	0	0
Spillback Cap Reductn	0	0	66	0	64	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.39	0.86	0.61	0.60	0.76	1.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave

Existing Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	692	1109	620	293	480	235	153	161	110	507	1079
v/c Ratio	1.17	0.95	1.01	1.07	0.45	0.42	0.84	0.86	0.42	1.02	0.80
Control Delay	126.5	29.9	30.9	119.0	32.9	15.2	91.5	93.8	26.5	73.9	30.3
Queue Delay	21.3	2.4	1.3	0.0	0.1	0.2	0.0	0.0	0.0	88.3	2.2
Total Delay	147.8	32.3	32.2	119.0	32.9	15.4	91.5	93.8	26.5	162.2	32.5
Queue Length 50th (ft)	~297	240	~209	~230	144	51	121	127	25	~391	423
Queue Length 95th (ft)	m#270	m219	m185	#401	193	121	m#235	m#249	m69	#582	495
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1169	616	274	1062	555	183	188	261	497	1344
Starvation Cap Reductn	0	25	3	0	0	0	0	0	0	89	147
Spillback Cap Reductn	24	0	0	0	53	53	0	0	0	0	21
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.97	1.01	1.07	0.48	0.47	0.84	0.86	0.42	1.24	0.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St

Existing Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1438	365
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.88	0.56
Control Delay	31.3	30.3	32.9	50.5	12.1	24.4	34.7
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.3	0.0
Total Delay	32.5	31.0	34.9	50.5	12.6	24.8	34.7
Queue Length 50th (ft)	67	69	260	38	0	533	248
Queue Length 95th (ft)	135	117	381	78	57	630	#368
Internal Link Dist (ft)		150				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1639	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	11	0	0	0	38	23	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.45	0.89	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street

Existing Plus Alt#3 SAT

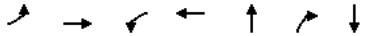
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	724	40	681	250	187	38	190	97
v/c Ratio	0.56	0.46	0.33	0.48	0.67	0.48	0.11	0.54	0.26
Control Delay	50.0	17.5	37.9	22.0	26.4	22.6	21.2	25.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	17.5	37.9	22.0	26.4	22.6	21.2	25.0	6.8
Queue Length 50th (ft)	27	87	15	119	84	57	12	64	0
Queue Length 95th (ft)	#93	#219	44	#223	163	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	129	1588	123	1425	467	488	458	483	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.46	0.33	0.48	0.54	0.38	0.08	0.39	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1043	165	1073	204	197	59
v/c Ratio	0.32	0.63	1.04	0.53	0.72	0.48	0.24
Control Delay	62.4	14.5	104.5	13.6	42.4	7.0	27.7
Queue Delay	0.0	0.3	0.0	1.2	0.0	0.0	0.0
Total Delay	62.4	14.8	104.5	14.8	42.4	7.0	27.7
Queue Length 50th (ft)	14	41	~117	67	126	0	27
Queue Length 95th (ft)	m22	#540	m#169	m#431	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1660	159	2034	441	530	445
Starvation Cap Reductn	0	0	0	678	0	0	0
Spillback Cap Reductn	0	164	0	0	0	9	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.70	1.04	0.79	0.46	0.38	0.13

Intersection Summary

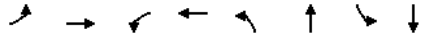
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	943	75	539	523	728	123	943
v/c Ratio	0.80	0.85	0.74	0.64	0.95	0.57	0.68	0.91
Control Delay	63.6	18.6	80.7	37.4	71.0	27.8	50.5	45.3
Queue Delay	0.0	1.5	0.0	0.7	16.1	0.0	0.0	0.1
Total Delay	63.6	20.1	80.7	38.1	87.1	27.8	50.5	45.4
Queue Length 50th (ft)	84	266	48	160	172	192	77	292
Queue Length 95th (ft)	#217	#362	#121	219	#274	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1110	106	839	549	1287	239	1041
Starvation Cap Reductn	0	60	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	39	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.90	0.71	0.72	1.03	0.57	0.51	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #3
2010

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1233	109	813	123	303	64	223	208
v/c Ratio	0.97	0.73	0.63	0.86	0.58	0.69	0.24	0.79	0.50
Control Delay	67.5	26.0	51.0	57.0	51.7	46.6	41.8	56.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	26.0	51.0	57.0	51.7	46.6	41.8	56.5	9.2
Queue Length 50th (ft)	374	358	79	321	83	99	40	151	0
Queue Length 95th (ft)	#593	476	m113	#465	141	143	79	#241	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1678	193	944	257	521	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.73	0.56	0.86	0.48	0.58	0.21	0.69	0.47

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	770	204	779	124	951
v/c Ratio	0.75	0.71	0.84	0.83	0.57	0.48	0.69
Control Delay	23.7	15.7	34.0	68.5	29.9	50.2	32.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	15.7	34.0	68.5	29.9	50.2	32.4
Queue Length 50th (ft)	24	80	246	141	226	82	293
Queue Length 95th (ft)	m31	87	291	#258	323	142	#441
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	207	1522	1113	257	1359	257	1376
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.58	0.69	0.79	0.57	0.48	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	69	69	100	167	279	125	334
v/c Ratio	0.34	0.33	0.17	0.26	0.72	0.53	0.45
Control Delay	38.3	36.9	1.2	0.4	30.7	36.9	17.8
Queue Delay	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Delay	38.3	36.9	1.2	0.5	30.7	36.9	17.8
Queue Length 50th (ft)	30	29	1	0	111	55	101
Queue Length 95th (ft)	88	86	2	0	257	138	225
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	541	565	949	942	677	541	988
Starvation Cap Reductn	0	0	292	257	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.12	0.15	0.24	0.41	0.23	0.34

Intersection Summary

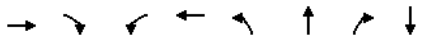
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	281	26	205	73
v/c Ratio	0.18	0.41	0.64	0.39
Control Delay	0.3	40.7	35.1	36.3
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	0.6	40.7	35.1	36.3
Queue Length 50th (ft)	1	11	88	30
Queue Length 95th (ft)	1	47	207	89
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1658	114	570	540
Starvation Cap Reductn	902	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.23	0.36	0.14

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	313	127	38	323	24	553
v/c Ratio	0.84	0.44	0.19	0.29	0.14	0.54
Control Delay	38.2	22.6	18.4	7.8	20.9	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	22.6	18.4	7.8	20.9	11.6
Queue Length 50th (ft)	67	32	10	30	7	63
Queue Length 95th (ft)	#186	73	27	137	23	#234
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	374	291	283	1109	283	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.44	0.13	0.29	0.08	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	213	199	62	331	157	471
v/c Ratio	0.65	0.59	0.83	0.77	0.11	0.14	0.14	0.21
Control Delay	72.9	20.3	82.1	75.2	0.5	0.4	0.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	82.1	75.2	0.5	0.4	0.2	6.8
Queue Length 50th (ft)	45	0	149	133	1	1	0	55
Queue Length 95th (ft)	#112	56	#268	#236	m1	1	m0	76
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	588	2366	1110	2211
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.79	0.73	0.11	0.14	0.14	0.21

Intersection Summary

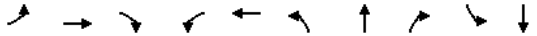
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	112	45	266	255	106	196
v/c Ratio	0.59	0.09	0.56	0.17	0.09	0.57
Control Delay	39.3	20.9	38.3	0.5	9.0	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	20.9	38.3	0.5	9.0	8.5
Queue Length 50th (ft)	66	9	56	2	26	0
Queue Length 95th (ft)	m113	m30	75	5	55	61
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	826	1236	1513	1178	487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.05	0.22	0.17	0.09	0.40

Intersection Summary

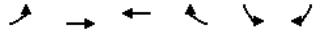
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	400	421	93	96	952	80	329
v/c Ratio	0.03	0.14	0.11	0.61	0.63	0.44	0.10	0.60	0.40	0.66
Control Delay	35.8	36.0	18.2	25.1	25.6	33.1	19.6	1.7	32.8	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	18.2	25.1	25.6	33.1	19.6	1.7	32.8	23.4
Queue Length 50th (ft)	2	9	0	153	163	39	16	0	34	126
Queue Length 95th (ft)	14	35	20	#370	#396	93	36	0	83	230
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	397	418	368	730	739	386	1329	1583	496	759
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.55	0.57	0.24	0.07	0.60	0.16	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	755	1103	859	136
v/c Ratio	0.37	0.20	0.56	0.77	0.85	0.24
Control Delay	39.1	4.9	17.4	14.1	35.0	4.7
Queue Delay	0.0	0.0	0.8	0.0	0.0	0.0
Total Delay	39.1	4.9	18.3	14.1	35.0	4.7
Queue Length 50th (ft)	70	28	97	584	263	0
Queue Length 95th (ft)	126	58	m184	m721	303	38
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2138	1340	1441	1373	715
Starvation Cap Reductn	0	0	294	0	0	0
Spillback Cap Reductn	0	1	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.72	0.77	0.64	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	1007	1215	376	560	655	645
v/c Ratio	0.24	0.42	0.82	0.49	0.88	1.03	0.91
Control Delay	25.7	9.0	20.7	2.6	45.7	69.8	41.9
Queue Delay	0.0	2.0	0.4	0.1	0.0	7.8	4.1
Total Delay	25.7	11.0	21.0	2.7	45.7	77.6	46.0
Queue Length 50th (ft)	17	153	154	9	343	~432	361
Queue Length 95th (ft)	m42	139	238	m16	#555	#675	#610
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	762	639	636	711
Starvation Cap Reductn	0	1185	0	41	0	0	0
Spillback Cap Reductn	0	143	46	0	0	14	33
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.84	0.84	0.52	0.88	1.05	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	458	1375	389	79	782	103	23	24	44	241	771
v/c Ratio	0.66	0.98	0.41	0.61	0.82	0.23	0.20	0.21	0.29	0.45	0.51
Control Delay	46.7	35.5	1.6	60.1	42.5	22.5	44.4	44.4	15.5	37.7	5.5
Queue Delay	0.0	9.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0
Total Delay	46.7	44.7	1.8	60.1	42.5	22.5	44.4	44.4	15.5	39.3	5.6
Queue Length 50th (ft)	146	~326	7	49	245	37	14	15	0	125	25
Queue Length 95th (ft)	m183	m#638	m13	#106	318	81	40	41	32	m184	81
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	690	1407	932	142	956	447	185	186	213	537	1509
Starvation Cap Reductn	0	56	109	0	0	0	0	0	0	158	25
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	1.02	0.47	0.56	0.82	0.23	0.12	0.13	0.21	0.64	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

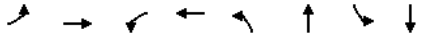
Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	535	157
v/c Ratio	0.07	0.07	0.23	0.23	0.15
Control Delay	26.1	25.9	2.6	7.7	10.6
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.1	25.9	3.3	7.7	10.6
Queue Length 50th (ft)	14	14	0	67	46
Queue Length 95th (ft)	38	31	23	91	64
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1189	2277	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.23	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	765	38	570	267	248	29	212	108
v/c Ratio	0.87	0.47	0.29	0.70	0.81	0.72	0.11	0.74	0.32
Control Delay	57.5	19.0	46.7	40.0	45.5	41.4	28.0	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	19.0	46.7	40.0	45.5	41.4	28.0	38.9	10.3
Queue Length 50th (ft)	254	155	23	172	166	149	13	131	1
Queue Length 95th (ft)	#538	250	55	233	255	231	30	152	40
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	478	1615	159	810	407	426	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.47	0.24	0.70	0.66	0.58	0.08	0.54	0.26

Intersection Summary

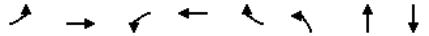
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	408	105	468	134	634	52	872
v/c Ratio	0.80	0.60	0.62	0.69	0.65	0.35	0.41	0.54
Control Delay	87.5	33.1	51.1	38.0	46.2	15.9	45.9	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	33.1	51.1	38.0	46.2	15.9	45.9	22.2
Queue Length 50th (ft)	63	108	65	146	83	118	32	197
Queue Length 95th (ft)	#154	152	118	185	137	193	69	317
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	895	212	1058	301	1831	230	1624
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.46	0.50	0.44	0.45	0.35	0.23	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



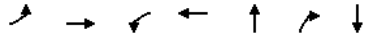
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	387	45	371	186	86	197	88
v/c Ratio	0.24	0.21	0.37	0.19	0.19	0.34	0.74	0.37
Control Delay	47.9	14.8	49.9	14.5	4.0	38.3	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	14.8	49.9	14.5	4.0	38.3	40.7	36.0
Queue Length 50th (ft)	16	56	28	44	0	50	116	50
Queue Length 95th (ft)	42	137	62	138	49	91	180	81
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1840	138	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.21	0.33	0.19	0.19	0.18	0.40	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	341	55	555	197	144	268	41	138	206
v/c Ratio	0.27	0.21	0.42	0.31	0.22	0.69	0.62	0.10	0.97	0.58
Control Delay	46.8	17.5	48.9	18.5	4.2	49.6	34.8	7.4	116.7	31.1
Queue Delay	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.5	48.9	19.3	4.7	49.6	34.8	7.4	116.7	31.1
Queue Length 50th (ft)	18	53	34	100	0	89	166	0	95	99
Queue Length 95th (ft)	46	116	71	196	48	149	202	23	#217	118
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1638	164	1781	894	266	671	596	142	538
Starvation Cap Reductn	0	0	0	872	378	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.21	0.34	0.61	0.38	0.54	0.40	0.07	0.97	0.38

Intersection Summary

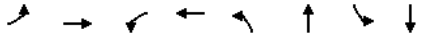
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	477	128	715	247	127	38
v/c Ratio	0.04	0.27	0.67	0.32	0.79	0.34	0.25
Control Delay	47.3	18.1	57.2	8.6	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.4	57.2	8.8	42.7	7.2	36.5
Queue Length 50th (ft)	2	88	82	18	153	0	21
Queue Length 95th (ft)	11	181	m120	m231	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1755	210	2227	487	520	329
Starvation Cap Reductn	0	673	0	725	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.44	0.61	0.48	0.51	0.24	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	456	34	653	315	834	168	974
v/c Ratio	0.63	0.59	0.21	0.90	0.65	0.53	0.77	0.64
Control Delay	61.5	30.9	47.3	48.1	47.9	24.4	49.1	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.5	30.9	47.3	48.1	47.9	24.4	49.1	26.8
Queue Length 50th (ft)	44	53	17	162	99	214	105	269
Queue Length 95th (ft)	119	190	m50	#267	144	318	168	368
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1038	179	789	481	1578	301	1511
Starvation Cap Reductn	0	0	0	0	0	0	0	68
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.44	0.19	0.83	0.65	0.53	0.56	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	436	82	644	240	394
v/c Ratio	0.28	0.23	0.44	0.31	0.40	0.73
Control Delay	16.5	8.8	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	8.8	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	20	80	23	30	25	51
Queue Length 95th (ft)	m29	113	55	93	51	#104
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2045	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.23	0.39	0.31	0.39	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.51	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	658	594	1096	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1135	1107
v/c Ratio	0.77	0.74	0.54	0.53
Control Delay	54.3	46.4	14.4	14.2
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.7	14.2
Queue Length 50th (ft)	94	136	232	222
Queue Length 95th (ft)	#144	185	304	292
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	389	631	2085	2079
Starvation Cap Reductn	0	0	370	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.66	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	551	1066
v/c Ratio	0.44	0.98	0.30	0.38
Control Delay	25.3	45.7	12.5	12.9
Queue Delay	0.0	0.0	1.6	0.0
Total Delay	25.3	45.7	14.0	12.9
Queue Length 50th (ft)	136	316	94	133
Queue Length 95th (ft)	184	#583	128	164
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	779	1822	2839
Starvation Cap Reductn	0	0	1046	0
Spillback Cap Reductn	14	0	0	56
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.97	0.71	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	589	457	629
v/c Ratio	0.68	0.37	0.75	0.26
Control Delay	25.3	13.5	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.6
Total Delay	25.3	13.5	34.4	5.2
Queue Length 50th (ft)	93	81	96	43
Queue Length 95th (ft)	130	131	#143	76
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1611	638	2462
Starvation Cap Reductn	0	0	0	1347
Spillback Cap Reductn	35	11	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.37	0.72	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1019	146	974	196	610	146	332	509
v/c Ratio	0.90	0.80	0.72	0.96	0.61	0.94	0.43	0.92	0.83
Control Delay	67.1	36.7	59.1	45.1	48.7	63.5	42.7	69.9	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.7	59.1	45.1	48.7	63.5	42.7	69.9	23.4
Queue Length 50th (ft)	210	336	100	~389	137	222	91	230	87
Queue Length 95th (ft)	#361	424	m103	m#398	m177	m#299	154	#393	#270
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1271	225	1011	322	646	354	373	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.65	0.96	0.61	0.94	0.41	0.89	0.82

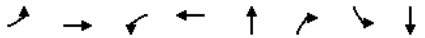
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	934	284	1257	196	1262
v/c Ratio	1.40	0.62	0.91	1.04	1.13	0.81	1.20
Control Delay	233.5	25.7	42.6	110.4	103.7	72.2	134.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	233.5	25.7	42.6	110.4	103.7	72.2	134.2
Queue Length 50th (ft)	~199	314	311	~217	~540	136	~567
Queue Length 95th (ft)	m#278	m374	#450	#386	#678	#257	#705
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	149	1517	1024	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	0.62	0.91	1.04	1.13	0.81	1.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	89	219	351	478	282	94	433
v/c Ratio	0.68	0.40	0.32	0.49	0.99	0.47	0.62	0.62
Control Delay	55.2	49.0	1.9	1.0	82.1	10.2	65.4	33.5
Queue Delay	0.0	0.0	1.5	2.0	0.0	0.0	0.0	0.0
Total Delay	55.2	49.0	3.4	3.0	82.1	10.2	65.4	33.5
Queue Length 50th (ft)	106	61	2	0	~367	21	69	253
Queue Length 95th (ft)	180	116	m9	m0	#645	102	#141	403
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	295	309	760	776	483	598	171	723
Starvation Cap Reductn	0	0	371	281	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.29	0.56	0.71	0.99	0.47	0.55	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	458	35	449	141
v/c Ratio	0.30	0.54	0.98	0.71
Control Delay	1.7	73.3	82.7	55.6
Queue Delay	0.5	0.0	0.0	0.0
Total Delay	2.2	73.3	82.7	55.6
Queue Length 50th (ft)	30	23	~341	99
Queue Length 95th (ft)	32	#81	#611	174
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1504	65	457	266
Starvation Cap Reductn	641	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	0.54	0.98	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	503	202	172	738	20	588
v/c Ratio	1.19	0.43	0.78	0.76	0.12	0.87
Control Delay	131.0	18.3	44.3	20.0	22.6	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.0	18.3	44.3	20.0	22.6	29.6
Queue Length 50th (ft)	~205	50	56	205	8	137
Queue Length 95th (ft)	#366	100	m#128	#476	m13	m#265
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	422	472	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.43	0.76	0.76	0.09	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	377	358	144	515	253	665
v/c Ratio	0.17	0.54	0.50	0.48	0.72	0.38	0.35	0.53
Control Delay	50.6	16.8	7.8	6.9	42.2	20.7	4.9	27.7
Queue Delay	0.0	1.2	0.9	0.8	0.0	0.7	0.6	0.0
Total Delay	50.6	18.1	8.7	7.7	42.2	21.4	5.5	27.7
Queue Length 50th (ft)	12	0	74	66	53	78	19	185
Queue Length 95th (ft)	35	52	116	100	m64	m78	m14	243
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	747	201	1358	713	1246
Starvation Cap Reductn	0	0	97	95	0	500	200	0
Spillback Cap Reductn	0	32	164	162	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.53	0.64	0.61	0.72	0.60	0.49	0.54

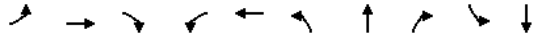
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	235	39	471	754	253	265
v/c Ratio	0.76	0.06	0.63	0.54	0.27	0.65
Control Delay	29.5	0.7	38.1	2.4	19.4	19.6
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	29.5	0.7	38.1	2.7	19.4	19.6
Queue Length 50th (ft)	89	0	102	14	103	68
Queue Length 95th (ft)	238	m2	114	18	193	147
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	883	1155	1401	928	534
Starvation Cap Reductn	0	0	0	174	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.04	0.41	0.61	0.27	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

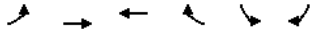


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	357	372	12	733	1467	283	645
v/c Ratio	0.61	1.24	0.22	0.87	0.91	0.14	0.90	0.93	0.86	0.80
Control Delay	48.0	169.7	28.9	50.4	53.2	47.6	48.0	12.3	51.0	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	169.7	28.9	50.4	53.2	47.6	48.0	12.3	51.0	33.1
Queue Length 50th (ft)	109	~322	23	226	237	7	238	0	171	320
Queue Length 95th (ft)	#193	#506	62	#389	#411	26	#350	#104	#294	#618
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	298	313	283	442	444	235	848	1583	378	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.24	0.22	0.81	0.84	0.05	0.86	0.93	0.75	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1306	1201	1069	347
v/c Ratio	0.46	0.47	1.00dr	0.86	0.96	0.50
Control Delay	45.4	5.4	21.3	18.9	54.3	10.3
Queue Delay	0.0	0.0	211.9	0.0	4.5	0.0
Total Delay	45.4	5.4	233.2	18.9	58.8	10.3
Queue Length 50th (ft)	94	71	431	684	377	42
Queue Length 95th (ft)	158	114	m363	m553	#514	124
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2179	1358	1399	1124	695
Starvation Cap Reductn	0	0	477	0	0	0
Spillback Cap Reductn	0	6	0	0	37	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.48	0.86	0.98	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1343	1907	447	601	827	589
v/c Ratio	0.44	0.90	1.13	0.59	1.06	1.40	1.72
Control Delay	64.5	17.1	93.7	5.8	92.1	217.8	360.5
Queue Delay	0.0	41.8	158.3	0.3	31.5	31.2	74.4
Total Delay	64.5	58.9	252.0	6.2	123.6	249.1	434.9
Queue Length 50th (ft)	108	82	~613	32	~493	~800	~1047
Queue Length 95th (ft)	m132	m94	m#579	m33	#723	#1065	#1015
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	761	565	590	342
Starvation Cap Reductn	0	155	107	57	0	0	0
Spillback Cap Reductn	0	256	403	0	39	28	30
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.09	1.49	0.63	1.14	1.47	1.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	626	1123	772	342	1236	297	76	80	69	440	867
v/c Ratio	1.18	1.11	1.10	1.25	1.16	0.58	0.36	0.37	0.26	0.89	0.72
Control Delay	130.7	89.1	70.8	174.4	119.7	35.3	50.0	50.4	25.1	59.8	11.9
Queue Delay	0.0	23.2	10.0	0.0	238.6	0.0	0.0	0.0	0.0	51.1	0.2
Total Delay	130.7	112.2	80.8	174.4	358.3	35.3	50.0	50.4	25.1	110.9	12.1
Queue Length 50th (ft)	~278	~491	~488	~296	~533	173	61	64	19	316	136
Queue Length 95th (ft)	m#227	m366	m263	#494	#697	279	113	118	66	#487	180
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1012	701	274	1062	508	214	217	262	493	1209
Starvation Cap Reductn	0	47	15	0	0	0	0	0	0	95	47
Spillback Cap Reductn	0	0	0	0	334	0	0	0	0	0	49
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	1.16	1.13	1.25	1.70	0.58	0.36	0.37	0.26	1.11	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1226	292
v/c Ratio	0.17	0.17	0.46	0.59	0.48
Control Delay	33.1	32.0	8.9	15.9	41.4
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	35.4	33.3	9.4	15.9	41.4
Queue Length 50th (ft)	61	64	88	270	207
Queue Length 95th (ft)	118	104	148	334	302
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1885	2069	610
Starvation Cap Reductn	352	752	544	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.65	0.59	0.48

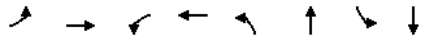
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1100	21	808	553	565	72	256	160
v/c Ratio	1.24	1.06	0.23	1.10	0.82	0.80	0.24	0.80	0.40
Control Delay	197.9	78.9	55.4	105.6	42.9	41.2	47.2	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	6.2	7.5	0.0	0.0	0.0
Total Delay	197.9	78.9	55.4	105.6	49.1	48.6	47.2	54.1	15.9
Queue Length 50th (ft)	~182	228	15	~341	332	333	51	187	13
Queue Length 95th (ft)	#328	#630	41	#467	#614	#615	100	273	86
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1037	97	733	677	707	499	525	549
Starvation Cap Reductn	0	0	0	0	84	107	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.06	0.22	1.10	0.93	0.94	0.14	0.49	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

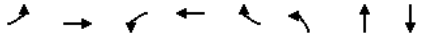


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	895	107	569	188	1408	118	1256
v/c Ratio	0.83	0.90	0.64	0.65	0.80	1.09	0.67	1.08
Control Delay	69.8	43.4	49.4	31.6	55.8	85.1	52.2	80.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	43.4	49.4	31.6	55.8	85.1	52.2	80.8
Queue Length 50th (ft)	90	247	59	143	104	~526	65	~466
Queue Length 95th (ft)	#194	#365	112	196	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	994	197	977	256	1287	197	1168
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.90	0.54	0.58	0.73	1.09	0.60	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	939	84	718	58	262	270	313
v/c Ratio	0.26	0.71	0.58	0.48	0.09	0.80	0.77	0.84
Control Delay	48.8	32.3	58.8	26.2	8.4	42.5	35.4	43.2
Queue Delay	0.0	3.5	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	35.7	58.8	26.7	8.4	42.5	35.4	43.2
Queue Length 50th (ft)	17	264	52	181	0	162	138	191
Queue Length 95th (ft)	44	#492	#127	#334	32	227	206	266
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1331	152	1508	679	478	491	494
Starvation Cap Reductn	0	292	0	377	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.90	0.55	0.63	0.09	0.55	0.55	0.63

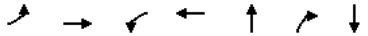
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	851	148	614	244	229	343	140	275	505
v/c Ratio	0.39	0.76	0.74	0.43	0.33	1.08	0.65	0.26	1.30	0.97
Control Delay	46.8	35.3	56.0	24.3	4.5	127.9	37.5	6.0	197.4	60.0
Queue Delay	0.0	6.9	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	42.2	56.0	25.4	4.9	127.9	37.5	6.0	197.4	60.0
Queue Length 50th (ft)	30	255	91	157	0	~164	190	0	~227	317
Queue Length 95th (ft)	64	333	#168	220	52	#312	286	44	#395	#485
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1124	230	1423	746	212	540	540	212	533
Starvation Cap Reductn	0	228	0	536	190	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.95	0.64	0.69	0.44	1.08	0.64	0.26	1.30	0.95

Intersection Summary

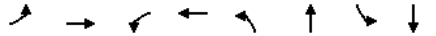
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1159	166	977	336	301	193
v/c Ratio	0.18	0.94	0.75	0.68	0.87	0.56	0.72
Control Delay	39.9	48.8	49.6	20.3	48.4	9.2	45.1
Queue Delay	0.0	91.8	0.0	0.7	0.0	1.7	3.2
Total Delay	39.9	140.7	49.6	21.0	48.4	10.9	48.3
Queue Length 50th (ft)	18	369	103	134	205	17	116
Queue Length 95th (ft)	46	#666	m57	m273	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1232	301	1445	452	589	349
Starvation Cap Reductn	0	274	0	189	0	0	0
Spillback Cap Reductn	0	179	0	0	0	151	82
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.21	0.55	0.78	0.74	0.69	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1108	49	709	521	1282	281	1343
v/c Ratio	0.92	1.10	0.51	1.05	1.17	0.98	1.09	1.00
Control Delay	49.1	81.2	59.6	81.7	137.1	52.7	123.6	55.1
Queue Delay	0.0	15.7	0.0	0.0	36.4	0.0	0.0	13.1
Total Delay	49.1	96.8	59.6	81.7	173.5	52.7	123.6	68.2
Queue Length 50th (ft)	112	~391	32	~248	~204	418	~210	~453
Queue Length 95th (ft)	m#124	m#443	m66	#342	#308	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1010	106	678	446	1307	258	1348
Starvation Cap Reductn	0	33	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	30	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.13	0.46	1.05	1.25	0.98	1.09	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	882	47	711	440	450
v/c Ratio	0.14	0.44	0.26	0.34	0.66	0.83
Control Delay	20.6	9.3	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	9.3	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	127	13	36	50	51
Queue Length 95th (ft)	m9	m140	36	103	88	#117
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	248	2115	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.19	0.34	0.64	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1616	1685
v/c Ratio	1.08	0.74	0.82	0.85
Control Delay	107.2	47.0	23.4	25.2
Queue Delay	0.0	0.0	2.9	0.0
Total Delay	107.2	47.0	26.2	25.2
Queue Length 50th (ft)	~197	129	445	482
Queue Length 95th (ft)	#306	180	566	613
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1974
Starvation Cap Reductn	0	0	250	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.94	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1109	1621
v/c Ratio	0.45	1.39	0.67	0.52
Control Delay	27.1	213.4	14.0	10.7
Queue Delay	0.3	0.0	33.2	0.4
Total Delay	27.4	213.4	47.3	11.1
Queue Length 50th (ft)	113	~549	198	175
Queue Length 95th (ft)	159	#772	268	212
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	553	1659	3103
Starvation Cap Reductn	0	0	612	0
Spillback Cap Reductn	158	0	0	792
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.39	1.06	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1104	788	916
v/c Ratio	0.96	0.83	0.88	0.38
Control Delay	61.0	38.2	46.6	8.5
Queue Delay	27.8	54.2	145.2	5.1
Total Delay	88.7	92.4	191.8	13.6
Queue Length 50th (ft)	308	376	269	135
Queue Length 95th (ft)	#437	#503	341	171
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1327	967	2384
Starvation Cap Reductn	0	0	370	1385
Spillback Cap Reductn	92	336	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.11	1.32	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	138	64	245	172	511	326	90	645
v/c Ratio	0.62	0.27	0.44	0.30	1.51	0.48	0.59	0.80
Control Delay	47.1	38.2	12.4	3.2	274.7	10.4	55.6	34.3
Queue Delay	0.0	0.0	0.8	0.6	0.0	0.0	0.0	0.0
Total Delay	47.1	38.2	13.2	3.8	274.7	10.4	55.6	34.3
Queue Length 50th (ft)	91	34	49	4	~499	30	60	379
Queue Length 95th (ft)	163	78	78	24	#811	124	123	#703
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	364	378	743	751	338	675	200	854
Starvation Cap Reductn	0	0	261	321	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.17	0.51	0.40	1.51	0.48	0.45	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1005: 65th Street & Overland Avenue

2010 Plus Alt#3 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	193	42	184	79
v/c Ratio	0.13	0.75	0.53	0.51
Control Delay	0.8	69.5	40.5	45.8
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	1.4	69.5	40.5	45.8
Queue Length 50th (ft)	8	26	109	48
Queue Length 95th (ft)	12	#96	198	102
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1632	77	479	346
Starvation Cap Reductn	1117	0	0	0
Spillback Cap Reductn	0	0	6	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.55	0.39	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1009: Shellmound Way & Christie Ave

2010 Plus Alt#3 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	545	509	164	546	454	775
v/c Ratio	0.14	0.38	0.95	0.90	1.59	0.47	0.64	0.74
Control Delay	35.6	27.7	39.8	33.1	292.7	13.0	4.3	37.9
Queue Delay	0.0	4.8	84.3	60.5	0.0	1.2	5.6	0.5
Total Delay	35.6	32.5	124.1	93.6	292.7	14.3	9.9	38.5
Queue Length 50th (ft)	33	60	400	367	~168	53	32	256
Queue Length 95th (ft)	69	120	#625	#562	m#179	m56	m19	330
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	389	596	588	103	1154	709	1054
Starvation Cap Reductn	0	0	90	89	0	382	194	0
Spillback Cap Reductn	15	177	138	136	0	0	38	66
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.70	1.19	1.13	1.59	0.71	0.88	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St

2010 Plus Alt#3 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	410	78	712	1034	330	359
v/c Ratio	0.91	0.09	0.83	0.83	0.46	0.33
Control Delay	32.3	1.0	22.5	30.8	30.1	7.3
Queue Delay	6.4	0.0	0.2	8.1	0.0	0.0
Total Delay	38.7	1.0	22.7	39.0	30.1	7.3
Queue Length 50th (ft)	265	4	228	784	180	73
Queue Length 95th (ft)	#432	m6	m227	m851	295	146
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1036	1186	1253	721	1137
Starvation Cap Reductn	55	0	0	191	0	0
Spillback Cap Reductn	0	0	80	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.08	0.64	0.97	0.46	0.32

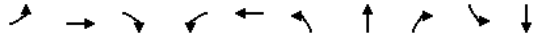
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd

2010 Plus Alt#3 SAT



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	572	555	45	333	1412	147	520
v/c Ratio	0.22	0.17	0.06	0.93	0.90	0.31	0.34	0.89	0.63	0.79
Control Delay	35.8	35.6	20.7	50.9	46.2	35.6	23.6	9.3	32.9	30.2
Queue Delay	0.0	0.0	0.0	25.8	17.9	0.0	0.0	0.0	0.0	7.4
Total Delay	35.8	35.6	20.7	76.7	64.1	35.6	23.6	9.3	32.9	37.6
Queue Length 50th (ft)	13	11	0	~332	~312	21	67	0	69	231
Queue Length 95th (ft)	39	34	13	#574	#558	54	116	#59	126	#439
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	329	346	301	615	616	313	1108	1583	441	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	51	69	69	0	0	0	0	159
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	1.05	1.01	0.14	0.30	0.89	0.33	0.93

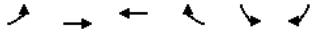
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

2010 Plus Alt#3 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	917	1151	1338	263
v/c Ratio	0.68	0.17	0.73	0.82	0.92	0.33
Control Delay	51.4	16.1	25.4	21.7	35.1	6.0
Queue Delay	0.0	0.0	30.7	0.0	93.9	0.0
Total Delay	51.4	16.1	56.2	21.7	129.1	6.0
Queue Length 50th (ft)	85	61	309	632	438	25
Queue Length 95th (ft)	141	93	m320	m708	513	73
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1776	1260	1399	1592	841
Starvation Cap Reductn	0	0	387	0	358	0
Spillback Cap Reductn	0	0	0	0	483	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.17	1.05	0.82	1.21	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp

2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1522	1649	463	420	734	712
v/c Ratio	0.73	1.27	0.99	0.56	0.57	0.93	1.83
Control Delay	67.6	150.2	47.7	4.8	27.1	37.1	403.1
Queue Delay	0.0	114.3	51.9	0.2	0.7	2.0	17.2
Total Delay	67.6	264.4	99.6	5.0	27.8	39.1	420.2
Queue Length 50th (ft)	73	~490	~431	18	229	362	~830
Queue Length 95th (ft)	m98	#614	#616	m39	336	#667	#1225
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1674	822	734	793	390
Starvation Cap Reductn	0	200	98	55	0	0	0
Spillback Cap Reductn	0	66	213	0	103	18	8
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.53	1.13	0.60	0.67	0.95	1.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	760	1451	734	380	726	321	153	161	110	607	1132
v/c Ratio	1.28	1.31	1.21	1.39	0.68	0.59	0.84	0.86	0.42	1.23	0.87
Control Delay	172.8	170.8	117.4	231.4	37.8	24.4	91.5	93.8	26.5	146.5	23.8
Queue Delay	0.0	15.2	2.6	0.0	0.8	0.0	0.0	0.0	0.0	122.6	47.5
Total Delay	172.8	186.0	120.0	231.4	38.6	24.4	91.5	93.8	26.5	269.1	71.3
Queue Length 50th (ft)	~350	~667	~596	~358	237	115	121	127	25	~520	252
Queue Length 95th (ft)	m#232	m#430	m196	#545	304	211	m#235	m#249	m69	m#686	m412
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	545	183	188	261	495	1300
Starvation Cap Reductn	0	28	3	0	0	0	0	0	0	91	271
Spillback Cap Reductn	0	0	0	0	115	0	0	0	0	0	184
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	1.35	1.22	1.39	0.77	0.59	0.84	0.86	0.42	1.50	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1732	411
v/c Ratio	0.21	0.22	0.88	0.93	0.48
Control Delay	23.4	23.0	31.8	21.4	12.9
Queue Delay	1.2	0.7	5.6	1.8	0.0
Total Delay	24.6	23.7	37.5	23.2	12.9
Queue Length 50th (ft)	78	82	336	627	234
Queue Length 95th (ft)	127	114	#540	#772	308
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	170	355	0	54	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.96	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street

2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	1040	41	846	307	262	39	250	103
v/c Ratio	0.82	0.91	0.38	0.94	0.78	0.63	0.11	0.66	0.26
Control Delay	84.6	36.8	41.4	45.2	34.2	27.7	21.3	28.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.6	36.8	41.4	45.2	34.2	27.7	21.3	28.7	6.7
Queue Length 50th (ft)	38	~237	16	177	113	90	13	92	0
Queue Length 95th (ft)	#120	#368	#46	#311	#228	166	35	160	34
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	113	1138	107	900	437	457	428	450	453
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.91	0.38	0.94	0.70	0.57	0.09	0.56	0.23

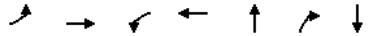
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

2010 Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1308	190	1247	226	237	60
v/c Ratio	0.32	0.81	1.19	0.62	0.75	0.52	0.24
Control Delay	62.3	23.0	137.2	15.7	43.0	6.8	27.9
Queue Delay	0.0	54.6	0.0	5.9	0.0	0.1	0.0
Total Delay	62.3	77.6	137.2	21.6	43.0	6.9	27.9
Queue Length 50th (ft)	13	92	~144	66	140	0	28
Queue Length 95th (ft)	m24	#735	m#152	m#470	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1621	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	695	0	0	0
Spillback Cap Reductn	0	448	0	0	0	30	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.12	1.19	0.95	0.51	0.45	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1174	78	699	622	1015	160	1217
v/c Ratio	0.81	1.06	0.76	0.84	1.13	0.82	0.78	1.16
Control Delay	62.5	55.2	84.2	45.8	119.9	36.3	57.0	114.3
Queue Delay	0.0	22.7	0.0	6.2	76.6	0.0	0.0	0.5
Total Delay	62.5	77.9	84.2	52.0	196.5	36.3	57.0	114.8
Queue Length 50th (ft)	88	~427	50	221	~238	312	99	~481
Queue Length 95th (ft)	m162	#527	#128	#323	#348	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1112	106	833	549	1243	239	1051
Starvation Cap Reductn	0	56	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	74	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.11	0.74	0.95	1.31	0.82	0.67	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #3
2030

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1319	124	881	127	354	72	287	214
v/c Ratio	1.08	0.83	0.70	1.05	0.55	0.76	0.24	0.91	0.48
Control Delay	97.5	31.4	48.4	81.3	51.4	50.0	41.7	74.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	31.4	48.4	81.3	51.4	50.0	41.7	74.5	9.3
Queue Length 50th (ft)	~479	417	84	~381	84	118	44	200	0
Queue Length 95th (ft)	#697	#534	m89	m#445	146	169	88	#354	65
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1580	193	836	257	520	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.83	0.64	1.05	0.49	0.68	0.24	0.89	0.48

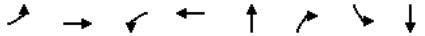
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	898	229	946	125	1099
v/c Ratio	0.83	0.64	0.96	0.91	0.84	0.49	0.97
Control Delay	36.7	11.0	46.9	81.2	42.6	50.4	57.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	11.0	46.9	81.2	42.6	50.4	57.1
Queue Length 50th (ft)	19	65	301	161	327	82	~414
Queue Length 95th (ft)	m28	97	#444	#302	#438	143	#562
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	161	1521	962	257	1129	257	1136
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.62	0.93	0.89	0.84	0.49	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	69	100	283	149	91	126	522
v/c Ratio	0.44	0.36	0.14	0.36	0.50	0.26	0.59	0.85
Control Delay	44.1	42.1	3.6	1.0	37.2	8.9	43.0	28.4
Queue Delay	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.0
Total Delay	44.1	42.1	3.8	1.4	37.2	8.9	43.0	28.4
Queue Length 50th (ft)	43	35	2	0	76	0	68	259
Queue Length 95th (ft)	109	94	14	0	161	43	153	448
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	430	449	884	921	540	549	430	1065
Starvation Cap Reductn	0	0	440	283	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.15	0.23	0.44	0.28	0.17	0.29	0.49

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	282	53	205	193
v/c Ratio	0.20	0.66	0.51	0.73
Control Delay	1.1	67.4	39.5	42.3
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	1.8	67.4	39.5	42.3
Queue Length 50th (ft)	11	27	100	101
Queue Length 95th (ft)	12	#122	233	219
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1445	90	452	430
Starvation Cap Reductn	823	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.59	0.45	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	127	38	371	24	666
v/c Ratio	0.85	0.44	0.19	0.33	0.14	0.65
Control Delay	40.7	22.6	18.7	8.1	20.9	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	22.6	18.7	8.1	20.9	15.0
Queue Length 50th (ft)	69	32	11	35	7	83
Queue Length 95th (ft)	#191	73	27	157	23	#344
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	371	291	283	1109	283	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.44	0.13	0.33	0.08	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	239	223	63	234	127	463
v/c Ratio	0.65	0.59	0.90	0.83	0.11	0.10	0.12	0.21
Control Delay	72.9	20.3	93.9	83.5	0.7	0.6	0.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	93.9	83.5	0.7	0.6	0.2	6.9
Queue Length 50th (ft)	45	0	168	151	1	1	0	54
Queue Length 95th (ft)	#112	56	#312	#277	1	1	0	75
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	588	2348	1093	2202
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.89	0.82	0.11	0.10	0.12	0.21

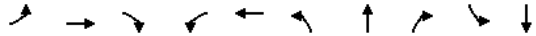
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	87	40	300	224	162	213
v/c Ratio	0.52	0.09	0.61	0.15	0.14	0.64
Control Delay	37.4	19.4	40.0	0.4	8.8	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	19.4	40.0	0.4	8.8	9.8
Queue Length 50th (ft)	50	4	73	2	35	5
Queue Length 95th (ft)	m91	m26	84	4	79	71
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	802	1236	1539	1199	494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.05	0.24	0.15	0.14	0.43

Intersection Summary

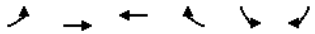
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	409	432	93	116	1015	80	354
v/c Ratio	0.03	0.14	0.12	0.61	0.63	0.45	0.12	0.64	0.41	0.71
Control Delay	35.8	36.2	18.2	25.8	26.4	33.5	19.6	2.0	33.1	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.8	26.4	33.5	19.6	2.0	33.1	24.3
Queue Length 50th (ft)	2	10	0	163	174	40	20	0	34	139
Queue Length 95th (ft)	14	35	20	#384	#412	93	42	0	83	250
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	383	403	355	719	728	371	1292	1583	480	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.57	0.59	0.25	0.09	0.64	0.17	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	810	1183	888	151
v/c Ratio	0.38	0.22	0.62	0.82	0.86	0.26
Control Delay	39.1	5.1	17.7	16.6	34.9	4.5
Queue Delay	0.0	0.0	1.2	0.0	0.1	0.0
Total Delay	39.1	5.1	18.9	16.6	35.0	4.5
Queue Length 50th (ft)	71	32	103	656	272	0
Queue Length 95th (ft)	126	63	m182	m746	315	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2122	1315	1441	1373	724
Starvation Cap Reductn	0	0	285	0	0	0
Spillback Cap Reductn	0	1	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.79	0.82	0.66	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1049	1314	423	604	705	692
v/c Ratio	0.27	0.44	0.89	0.53	0.95	1.12	0.98
Control Delay	27.3	9.1	23.8	2.7	55.8	98.8	55.4
Queue Delay	0.0	2.2	1.7	0.2	0.0	34.8	44.7
Total Delay	27.3	11.3	25.5	2.9	55.8	133.6	100.1
Queue Length 50th (ft)	21	158	173	11	386	~515	417
Queue Length 95th (ft)	m49	143	m#291	m14	#621	#762	#689
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	794	639	631	707
Starvation Cap Reductn	0	1154	0	44	0	0	0
Spillback Cap Reductn	0	68	68	0	0	43	86
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.93	0.56	0.95	1.20	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	315	1601	334	75	843	99	22	23	42	231	771
v/c Ratio	0.46	1.14	0.37	0.59	0.88	0.22	0.19	0.20	0.28	0.43	0.51
Control Delay	41.3	89.9	1.7	58.4	47.2	23.0	44.1	44.3	15.5	38.6	6.0
Queue Delay	0.0	8.6	0.2	0.0	2.5	0.0	0.0	0.0	0.0	1.5	0.0
Total Delay	41.3	98.5	1.9	58.4	49.7	23.0	44.1	44.3	15.5	40.1	6.1
Queue Length 50th (ft)	92	~652	8	47	271	37	14	14	0	120	66
Queue Length 95th (ft)	m117	m#759	m14	#95	#378	79	38	40	32	m165	m90
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	690	1407	889	142	956	445	185	186	212	537	1510
Starvation Cap Reductn	0	24	125	0	0	0	0	0	0	161	26
Spillback Cap Reductn	0	0	0	0	48	0	0	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	1.16	0.44	0.53	0.93	0.22	0.12	0.12	0.20	0.61	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	543	205
v/c Ratio	0.07	0.07	0.20	0.24	0.20
Control Delay	27.1	26.5	3.1	7.7	11.1
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.1	26.5	3.8	7.7	11.1
Queue Length 50th (ft)	15	14	0	68	61
Queue Length 95th (ft)	38	31	25	93	87
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2279	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.24	0.20

Intersection Summary

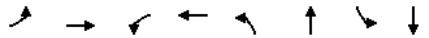
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	843	38	621	309	313	32	306	115
v/c Ratio	1.11	0.58	0.29	0.77	0.86	0.83	0.09	0.86	0.29
Control Delay	119.6	23.4	46.7	42.5	51.6	48.9	24.7	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.6	23.4	46.7	42.5	51.6	48.9	24.7	45.3	10.2
Queue Length 50th (ft)	~363	211	23	192	197	196	12	159	9
Queue Length 95th (ft)	#556	286	55	256	#318	#309	m26	#305	44
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	383	1444	159	810	407	426	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.58	0.24	0.77	0.76	0.73	0.09	0.78	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

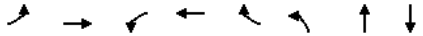
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	466	111	552	132	808	52	1042
v/c Ratio	0.87	0.69	0.64	0.73	0.65	0.46	0.41	0.68
Control Delay	99.9	35.1	52.0	37.5	46.2	19.0	45.9	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	35.1	52.0	37.5	46.2	19.0	45.9	26.8
Queue Length 50th (ft)	70	131	69	173	82	170	32	264
Queue Length 95th (ft)	#171	173	124	211	136	272	69	#458
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	890	212	1058	301	1753	230	1543
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.52	0.52	0.52	0.44	0.46	0.23	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	407	87	432	341	95	440	261
v/c Ratio	0.25	0.35	0.58	0.31	0.41	0.21	0.93	0.79
Control Delay	48.4	26.4	58.3	24.6	5.1	29.9	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.4	58.3	24.6	5.5	29.9	56.0	41.8
Queue Length 50th (ft)	16	97	53	91	0	47	265	160
Queue Length 95th (ft)	43	155	#126	177	71	89	#442	222
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1176	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.35	0.56	0.31	0.51	0.20	0.88	0.53

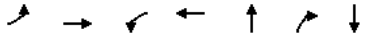
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	447	60	811	222	143	343	42	185	277
v/c Ratio	0.27	0.29	0.44	0.48	0.25	0.69	0.73	0.10	1.30	0.70
Control Delay	46.8	20.0	49.6	21.7	4.1	49.5	35.8	7.3	214.1	32.9
Queue Delay	0.0	0.0	0.0	1.5	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	20.0	49.6	23.3	4.5	49.5	35.8	7.3	214.1	32.9
Queue Length 50th (ft)	18	88	37	186	0	89	203	0	~157	125
Queue Length 95th (ft)	46	156	76	302	50	149	262	23	#294	181
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1565	165	1707	878	266	671	597	142	539
Starvation Cap Reductn	0	0	0	670	309	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.29	0.36	0.78	0.39	0.54	0.51	0.07	1.30	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

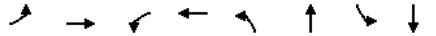


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	627	128	916	444	127	58
v/c Ratio	0.04	0.45	0.68	0.49	0.94	0.27	0.39
Control Delay	47.3	25.1	49.6	11.1	60.4	12.3	39.1
Queue Delay	0.0	0.7	0.0	0.6	0.0	0.0	0.0
Total Delay	47.3	25.9	49.6	11.7	60.4	12.3	39.1
Queue Length 50th (ft)	2	152	58	31	274	19	33
Queue Length 95th (ft)	11	243	m107	m283	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1392	208	1857	489	491	295
Starvation Cap Reductn	0	435	0	524	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.66	0.62	0.69	0.91	0.26	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	575	34	841	369	1020	175	1136
v/c Ratio	0.63	0.54	0.23	0.86	0.77	0.79	0.78	0.92
Control Delay	69.1	35.1	49.0	45.5	53.2	34.9	49.7	44.3
Queue Delay	0.0	0.1	0.0	0.1	2.3	0.0	0.0	0.1
Total Delay	69.1	35.2	49.0	45.5	55.5	34.9	49.7	44.4
Queue Length 50th (ft)	70	55	19	210	118	303	109	360
Queue Length 95th (ft)	126	240	m51	#421	#180	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1169	160	974	481	1286	301	1233
Starvation Cap Reductn	0	60	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	3	41	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.52	0.21	0.87	0.84	0.79	0.58	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	513	117	829	240	409
v/c Ratio	0.31	0.29	0.59	0.41	0.40	0.75
Control Delay	18.7	9.1	32.8	7.7	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	9.1	32.8	7.7	16.0	26.3
Queue Length 50th (ft)	26	61	33	42	25	52
Queue Length 95th (ft)	m40	m115	#86	127	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.29	0.55	0.41	0.39	0.72

Intersection Summary

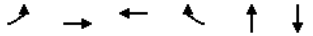
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	463	63	183	5	317
v/c Ratio	0.65	0.06	0.44	0.01	0.55
Control Delay	10.8	4.4	10.2	10.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	4.4	10.2	10.8	5.4
Queue Length 50th (ft)	39	4	18	1	10
Queue Length 95th (ft)	#138	19	65	6	59
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	728	1192	646	732	854
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.05	0.28	0.01	0.37

Intersection Summary

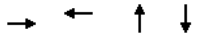
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	565	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1357	1303
v/c Ratio	0.83	0.77	0.66	0.64
Control Delay	60.2	47.9	17.2	16.6
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	60.2	47.9	17.8	16.6
Queue Length 50th (ft)	101	147	316	295
Queue Length 95th (ft)	#170	202	398	374
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	321	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.78	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	672	1253
v/c Ratio	0.58	1.18	0.38	0.45
Control Delay	27.5	116.6	13.5	14.1
Queue Delay	0.1	0.0	3.3	0.0
Total Delay	27.6	116.6	16.8	14.1
Queue Length 50th (ft)	201	~561	120	165
Queue Length 95th (ft)	262	#797	160	199
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1304	729	1789	2792
Starvation Cap Reductn	0	0	993	0
Spillback Cap Reductn	38	0	0	205
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.18	0.84	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	710	560	715
v/c Ratio	0.71	0.47	0.88	0.30
Control Delay	25.2	15.8	45.2	5.4
Queue Delay	0.0	0.1	0.0	0.7
Total Delay	25.2	15.8	45.2	6.1
Queue Length 50th (ft)	108	107	122	54
Queue Length 95th (ft)	146	171	#206	96
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	638	2392
Starvation Cap Reductn	0	0	0	1247
Spillback Cap Reductn	47	76	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.49	0.88	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1056	156	1031	213	685	159	407	533
v/c Ratio	0.92	0.85	0.76	1.05	0.66	1.06	0.45	1.09	0.87
Control Delay	71.3	39.9	57.2	61.7	50.6	91.4	43.4	115.4	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	39.9	57.2	61.7	50.6	91.4	43.4	115.4	29.6
Queue Length 50th (ft)	219	355	108	~428	149	~274	99	~325	119
Queue Length 95th (ft)	#380	#459	m92	m310	m189	m#358	166	#517	#321
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	645	354	373	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.66	1.06	0.45	1.09	0.87

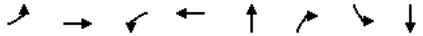
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	1010	294	1474	201	1411
v/c Ratio	1.70	0.67	1.16	1.07	1.32	0.83	1.34
Control Delay	363.6	26.4	112.7	120.0	183.0	74.7	193.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	363.6	26.4	112.7	120.0	183.0	74.7	193.0
Queue Length 50th (ft)	~226	344	~441	~232	~711	140	~686
Queue Length 95th (ft)	m#290	m399	#573	#402	#852	#266	#826
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	125	1518	874	274	1116	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.70	0.67	1.16	1.07	1.32	0.83	1.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	144	89	219	639	448	282	98	664
v/c Ratio	0.68	0.40	0.32	0.84	1.35	0.45	0.61	0.92
Control Delay	55.8	49.5	7.1	10.2	211.5	7.8	69.0	53.9
Queue Delay	0.0	0.0	9.6	141.5	0.0	0.0	0.6	0.0
Total Delay	55.8	49.5	16.8	151.6	211.5	7.8	69.7	53.9
Queue Length 50th (ft)	108	63	18	36	~454	8	74	476
Queue Length 95th (ft)	177	115	m14	m0	#696	81	#150	#768
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	297	311	684	762	332	622	164	722
Starvation Cap Reductn	0	0	425	275	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	1	6	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.29	0.85	1.31	1.35	0.45	0.62	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	463	39	449	453
v/c Ratio	0.33	0.63	1.37	1.45
Control Delay	2.8	89.0	221.7	253.6
Queue Delay	0.6	0.0	17.2	44.1
Total Delay	3.5	89.0	238.9	297.7
Queue Length 50th (ft)	49	28	~458	~478
Queue Length 95th (ft)	43	#93	#699	#724
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1389	62	328	313
Starvation Cap Reductn	562	0	0	0
Spillback Cap Reductn	0	0	9	20
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.56	0.63	1.41	1.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	527	202	172	795	20	644
v/c Ratio	1.27	0.43	0.78	0.82	0.12	0.96
Control Delay	161.0	18.3	44.8	22.9	22.8	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.0	18.3	44.8	22.9	22.8	42.2
Queue Length 50th (ft)	~225	50	56	229	8	174
Queue Length 95th (ft)	#389	100	m#128	#523	m14	m#314
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	416	472	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.43	0.76	0.82	0.09	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	412	390	137	413	231	680
v/c Ratio	0.17	0.54	0.55	0.52	0.70	0.30	0.33	0.54
Control Delay	50.6	16.8	8.3	7.4	47.4	21.5	5.2	27.8
Queue Delay	0.0	0.6	1.2	1.0	0.0	0.4	0.5	0.0
Total Delay	50.6	17.5	9.5	8.4	47.4	21.9	5.6	27.8
Queue Length 50th (ft)	12	0	78	64	48	60	19	190
Queue Length 95th (ft)	35	52	131	114	m86	m85	m37	248
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	748	196	1358	699	1251
Starvation Cap Reductn	0	0	94	93	0	510	180	0
Spillback Cap Reductn	0	19	161	158	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.50	0.69	0.66	0.70	0.49	0.45	0.54

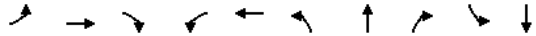
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	216	36	499	731	319	303
v/c Ratio	0.76	0.05	0.65	0.51	0.34	0.80
Control Delay	30.4	0.7	39.4	2.1	20.5	26.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	30.4	0.7	39.4	2.3	20.5	26.8
Queue Length 50th (ft)	87	0	107	6	136	110
Queue Length 95th (ft)	189	m1	118	17	253	194
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	858	1155	1426	939	523
Starvation Cap Reductn	0	0	0	176	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.04	0.43	0.58	0.34	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

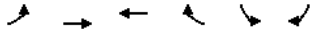


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	311	325	12	767	1545	283	678
v/c Ratio	0.60	1.22	0.22	0.82	0.85	0.13	0.91	0.98	0.86	0.82
Control Delay	46.8	158.6	28.6	44.0	45.5	47.5	48.5	20.3	49.5	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	158.6	28.6	44.0	45.5	47.5	48.5	20.3	49.5	33.7
Queue Length 50th (ft)	107	~316	23	189	200	7	248	0	169	338
Queue Length 95th (ft)	#193	#506	62	#315	#336	26	#374	#210	#294	#666
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	304	320	289	441	443	239	871	1583	385	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.22	0.22	0.71	0.73	0.05	0.88	0.98	0.74	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1385	1283	997	361
v/c Ratio	0.46	0.49	1.04dr	0.92	0.92	0.51
Control Delay	45.6	5.9	28.2	21.1	47.0	8.9
Queue Delay	0.0	0.0	206.1	0.0	2.8	0.0
Total Delay	45.6	5.9	234.3	21.1	49.8	8.9
Queue Length 50th (ft)	95	87	~492	746	342	33
Queue Length 95th (ft)	160	134	m391	m636	#458	113
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2199	1375	1399	1124	716
Starvation Cap Reductn	0	0	444	0	0	0
Spillback Cap Reductn	0	10	0	0	62	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.50	1.49	0.92	0.94	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1221	1932	470	603	818	592
v/c Ratio	0.45	0.82	1.15	0.61	1.07	1.38	1.71
Control Delay	64.2	14.5	99.8	6.2	93.2	207.1	355.2
Queue Delay	0.0	17.5	175.6	0.4	30.8	40.9	89.3
Total Delay	64.2	32.0	275.4	6.6	124.0	248.0	444.6
Queue Length 50th (ft)	111	84	~627	37	~496	~779	~1044
Queue Length 95th (ft)	m142	m101	m#577	m35	#726	#1042	#1015
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	594	346
Starvation Cap Reductn	0	181	108	58	0	0	0
Spillback Cap Reductn	0	290	431	0	38	37	36
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.02	1.54	0.66	1.14	1.47	1.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	469	1191	745	325	1274	283	72	76	66	424	888
v/c Ratio	0.88	1.17	1.05	1.19	1.20	0.56	0.34	0.35	0.25	0.86	0.73
Control Delay	57.2	114.2	48.8	151.2	134.1	35.3	49.6	49.9	25.2	54.8	12.2
Queue Delay	0.0	25.0	7.3	0.0	256.3	0.0	0.0	0.0	0.0	41.9	0.3
Total Delay	57.2	139.1	56.2	151.2	390.4	35.3	49.6	49.9	25.2	96.8	12.5
Queue Length 50th (ft)	177	~545	~281	~272	~564	167	57	61	19	300	133
Queue Length 95th (ft)	m167	m#456	m246	#470	#733	271	110	113	65	#463	159
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	505	214	217	259	493	1215
Starvation Cap Reductn	0	47	13	0	0	0	0	0	0	99	47
Spillback Cap Reductn	0	0	0	0	343	0	0	0	0	0	55
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.23	1.07	1.19	1.77	0.56	0.34	0.35	0.25	1.08	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1245	348
v/c Ratio	0.17	0.17	0.45	0.60	0.57
Control Delay	32.3	31.0	9.2	16.0	44.5
Queue Delay	2.3	1.3	0.6	0.0	0.0
Total Delay	34.5	32.3	9.8	16.0	44.5
Queue Length 50th (ft)	62	65	93	277	257
Queue Length 95th (ft)	118	104	149	342	357
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1842	2069	610
Starvation Cap Reductn	351	750	574	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.65	0.60	0.57

Intersection Summary

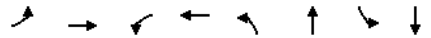
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1201	24	859	594	661	73	314	158
v/c Ratio	1.35	1.23	0.26	1.17	0.95	1.01	0.20	0.83	0.36
Control Delay	232.2	146.7	56.4	130.5	63.4	75.6	43.4	53.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	18.9	40.9	0.0	0.0	0.0
Total Delay	232.2	146.7	56.4	130.5	82.3	116.5	43.4	53.4	14.2
Queue Length 50th (ft)	~207	~568	17	~381	418	~509	49	216	16
Queue Length 95th (ft)	m#353	m#701	45	#510	#727	#817	m88	301	79
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	975	97	733	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	50	65	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.23	0.25	1.17	1.03	1.12	0.15	0.60	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

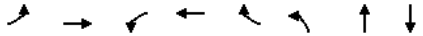


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	971	112	622	195	1592	118	1460
v/c Ratio	0.97	0.96	0.65	0.70	0.82	1.26	0.67	1.28
Control Delay	99.3	52.0	50.5	32.7	58.0	152.5	52.2	163.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	52.0	50.5	32.7	58.0	152.5	52.2	163.0
Queue Length 50th (ft)	110	280	61	159	108	~649	65	~601
Queue Length 95th (ft)	#243	#420	#118	217	#213	#786	#131	#737
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1013	197	978	256	1262	197	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.96	0.57	0.64	0.76	1.26	0.60	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	995	166	804	113	280	540	711
v/c Ratio	0.31	1.23	1.34	0.82	0.23	0.59	1.10	1.45
Control Delay	50.1	146.4	234.7	44.0	7.4	37.5	106.5	241.8
Queue Delay	0.0	68.1	24.5	2.5	0.0	0.0	0.0	1.3
Total Delay	50.1	214.5	259.2	46.5	7.4	37.5	106.5	243.1
Queue Length 50th (ft)	21	~405	~139	267	0	155	~383	~626
Queue Length 95th (ft)	51	#534	#270	#399	43	241	#590	#852
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	811	124	975	500	478	489	492
Starvation Cap Reductn	0	90	0	84	0	0	0	0
Spillback Cap Reductn	0	17	5	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.38	1.39	0.90	0.23	0.59	1.10	1.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

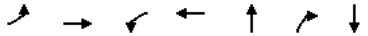
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1121	151	836	274	234	413	140	344	667
v/c Ratio	0.39	1.02	0.74	0.60	0.36	1.10	0.76	0.26	1.62	1.25
Control Delay	46.8	66.6	56.8	27.4	4.5	134.7	43.2	6.0	321.0	150.3
Queue Delay	0.0	97.5	0.0	5.4	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	164.1	56.8	32.7	5.0	134.7	43.2	6.0	321.0	150.3
Queue Length 50th (ft)	30	~415	93	232	0	~171	240	0	~324	~537
Queue Length 95th (ft)	64	#548	#173	314	55	#321	#377	44	m#382	m#585
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1101	230	1400	756	212	540	540	212	535
Starvation Cap Reductn	0	207	0	492	185	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.25	0.66	0.92	0.48	1.10	0.76	0.26	1.62	1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



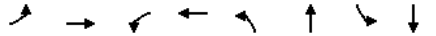
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1495	166	1169	535	302	209
v/c Ratio	0.19	1.35	0.78	0.90	1.18	0.59	0.76
Control Delay	40.1	192.3	50.4	25.0	136.2	19.4	46.7
Queue Delay	0.0	133.1	0.0	11.1	0.0	4.0	4.8
Total Delay	40.1	325.4	50.4	36.1	136.2	23.4	51.4
Queue Length 50th (ft)	19	~652	95	~427	~411	71	126
Queue Length 95th (ft)	48	#912	m51	m#285	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1109	301	1305	454	515	348
Starvation Cap Reductn	0	200	0	136	0	0	0
Spillback Cap Reductn	0	83	0	0	0	138	83
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.64	0.55	1.00	1.18	0.80	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1369	49	837	577	1431	298	1634
v/c Ratio	0.95	1.34	0.51	1.24	1.29	1.09	1.20	1.23
Control Delay	38.2	183.3	57.1	153.4	184.7	86.3	159.0	138.0
Queue Delay	2.1	21.4	0.0	6.6	0.0	1.8	0.0	21.3
Total Delay	40.4	204.7	57.1	160.0	184.7	88.1	159.0	159.3
Queue Length 50th (ft)	123	~577	32	~344	~243	~547	~232	~682
Queue Length 95th (ft)	m76	m#395	m65	m#446	#350	#685	#396	#823
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1019	106	674	446	1307	249	1333
Starvation Cap Reductn	0	35	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.39	0.46	1.26	1.29	1.10	1.20	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1067	47	817	440	485
v/c Ratio	0.25	0.54	0.26	0.42	0.66	0.86
Control Delay	20.6	11.5	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	11.5	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	165	13	44	50	52
Queue Length 95th (ft)	m17	m152	36	131	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1987	248	1955	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.54	0.19	0.42	0.64	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	597	112	349	160	807
v/c Ratio	1.16	0.13	1.09	0.21	1.04
Control Delay	114.8	13.6	110.1	12.2	64.8
Queue Delay	0.0	0.0	0.0	0.0	16.8
Total Delay	114.8	13.6	110.1	12.2	81.6
Queue Length 50th (ft)	~333	33	~209	40	~443
Queue Length 95th (ft)	#540	64	#380	79	#670
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	750	775
Starvation Cap Reductn	0	0	0	0	32
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.16	0.13	1.09	0.21	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1811	2029
v/c Ratio	1.11	0.74	0.92	1.03
Control Delay	117.3	47.0	30.1	51.8
Queue Delay	0.0	0.0	18.5	0.0
Total Delay	117.3	47.0	48.6	51.8
Queue Length 50th (ft)	~206	130	556	~780
Queue Length 95th (ft)	#315	180	#771	#935
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1976	1974
Starvation Cap Reductn	0	0	222	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.03	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1229	1955
v/c Ratio	0.62	1.58	0.79	0.63
Control Delay	30.2	295.5	18.0	12.2
Queue Delay	1.0	0.0	65.6	2.4
Total Delay	31.3	295.5	83.5	14.6
Queue Length 50th (ft)	168	~663	252	234
Queue Length 95th (ft)	227	#891	349	280
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	534	1555	3103
Starvation Cap Reductn	0	0	477	0
Spillback Cap Reductn	186	0	0	977
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	1.58	1.14	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1224	976	1062
v/c Ratio	1.14	0.98	1.01	0.45
Control Delay	113.0	57.0	71.1	9.1
Queue Delay	85.0	163.6	248.3	11.7
Total Delay	198.0	220.5	319.4	20.9
Queue Length 50th (ft)	~441	444	~360	166
Queue Length 95th (ft)	#573	#601	#500	207
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1303
Spillback Cap Reductn	130	361	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.33	1.38	1.59	0.99

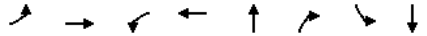
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1004: 65th Street & Shellmound St

2030 Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	143	64	245	351	473	326	98	956
v/c Ratio	1.00	0.42	0.45	0.57	1.25	0.39	0.74	1.01
Control Delay	133.0	56.0	15.7	5.1	164.7	4.0	80.3	61.4
Queue Delay	0.0	0.0	26.8	6.4	0.0	0.0	0.0	0.0
Total Delay	133.0	56.0	42.4	11.5	164.7	4.0	80.3	61.4
Queue Length 50th (ft)	~119	43	54	0	~483	0	79	~777
Queue Length 95th (ft)	#258	91	m69	m0	#694	57	#162	#1067
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	143	153	543	614	379	839	143	949
Starvation Cap Reductn	0	0	294	208	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.42	0.98	0.86	1.25	0.39	0.69	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1005: 65th Street & Overland Avenue

2030 Plus Alt#3 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	200	47	184	262
v/c Ratio	0.14	0.81	0.80	0.97
Control Delay	1.8	119.1	74.3	98.8
Queue Delay	1.2	0.0	0.9	0.0
Total Delay	3.0	119.1	75.2	98.8
Queue Length 50th (ft)	18	37	146	212
Queue Length 95th (ft)	m19	#113	#260	#388
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1429	60	239	271
Starvation Cap Reductn	1024	0	0	0
Spillback Cap Reductn	0	0	6	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.78	0.79	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1009: Shellmound Way & Christie Ave

2030 Plus Alt#3 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	576	537	155	416	412	785
v/c Ratio	0.14	0.38	0.97	0.92	1.60	0.37	0.56	0.76
Control Delay	35.6	29.1	49.4	39.2	322.7	17.6	3.2	39.3
Queue Delay	0.0	5.9	109.0	83.7	0.0	0.7	2.3	1.1
Total Delay	35.6	35.0	158.4	122.9	322.7	18.3	5.5	40.4
Queue Length 50th (ft)	33	63	406	372	~157	53	3	260
Queue Length 95th (ft)	69	124	#676	#610	m#226	m70	m17	335
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	385	596	589	97	1120	741	1031
Starvation Cap Reductn	0	0	91	84	0	393	205	0
Spillback Cap Reductn	15	182	139	137	0	0	31	89
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.73	1.26	1.19	1.60	0.57	0.77	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St

2030 Plus Alt#3 SAT

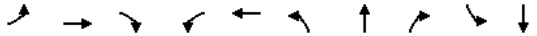
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	373	73	751	1008	448	378
v/c Ratio	0.91	0.08	0.87	0.78	0.59	0.35
Control Delay	33.5	1.1	23.0	26.9	32.8	8.0
Queue Delay	0.6	0.0	0.4	6.0	0.0	0.0
Total Delay	34.1	1.1	23.4	33.0	32.8	8.0
Queue Length 50th (ft)	238	5	213	755	246	84
Queue Length 95th (ft)	m#347	m7	m241	m817	#454	163
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1001	1186	1294	756	1163
Starvation Cap Reductn	18	0	0	235	0	0
Spillback Cap Reductn	0	0	120	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.07	0.70	0.95	0.59	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#3 SAT

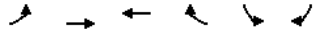


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	475	461	45	370	1433	147	561
v/c Ratio	0.22	0.17	0.07	0.80	0.77	0.32	0.35	0.91	0.63	0.81
Control Delay	35.9	35.6	20.7	36.7	34.8	35.7	23.6	10.4	33.3	33.0
Queue Delay	0.0	0.0	0.0	4.4	3.2	0.0	0.0	0.0	0.0	3.0
Total Delay	35.9	35.6	20.7	41.0	38.1	35.7	23.6	10.4	33.3	35.9
Queue Length 50th (ft)	13	11	0	230	220	21	76	0	69	257
Queue Length 95th (ft)	39	34	13	#450	#433	54	128	#83	126	#491
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	596	306	1136	1583	431	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	22	67	67	0	0	0	0	83
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.90	0.87	0.15	0.33	0.91	0.34	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd
2030 Plus Alt#3 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	950	1238	1172	282
v/c Ratio	0.68	0.20	0.71	0.88	0.88	0.37
Control Delay	51.4	13.9	22.7	24.7	34.0	4.8
Queue Delay	0.0	0.0	43.3	0.0	144.1	0.0
Total Delay	51.4	13.9	66.0	24.7	178.1	4.8
Queue Length 50th (ft)	87	64	315	730	391	16
Queue Length 95th (ft)	143	108	m318	m739	420	62
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1893	1343	1399	1592	865
Starvation Cap Reductn	0	0	466	0	311	0
Spillback Cap Reductn	0	2	0	0	702	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.20	1.08	0.88	1.32	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1373	1724	529	464	784	762
v/c Ratio	0.77	1.15	1.04	0.62	0.63	0.99	1.95
Control Delay	69.3	98.5	63.1	5.0	28.9	50.0	457.1
Queue Delay	0.0	210.7	87.0	0.3	0.5	66.0	245.2
Total Delay	69.3	309.3	150.0	5.3	29.5	116.0	702.3
Queue Length 50th (ft)	78	~424	~534	22	262	436	~955
Queue Length 95th (ft)	m123	#530	m#655	m40	382	#751	#1357
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	860	734	793	391
Starvation Cap Reductn	0	271	90	54	0	0	0
Spillback Cap Reductn	0	349	269	0	64	122	93
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.62	1.24	0.66	0.69	1.17	2.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	538	1538	827	380	816	321	153	161	110	616	1185
v/c Ratio	0.91	1.46	1.36	1.39	0.77	0.60	0.84	0.86	0.42	1.24	0.92
Control Delay	56.8	235.1	186.1	231.4	40.8	26.2	91.5	93.8	26.5	152.8	27.2
Queue Delay	0.0	21.0	2.0	0.0	2.4	0.0	0.0	0.0	0.0	126.4	92.0
Total Delay	56.8	256.1	188.1	231.4	43.2	26.2	91.5	93.8	26.5	279.1	119.2
Queue Length 50th (ft)	199	~791	~776	~358	275	125	121	127	25	~535	282
Queue Length 95th (ft)	m160	m#558	m#483	#545	350	222	m#235	m#249	m69	m#670	m#472
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	606	274	1062	536	183	188	261	495	1293
Starvation Cap Reductn	0	33	2	0	0	0	0	0	0	92	264
Spillback Cap Reductn	0	0	0	0	137	0	0	0	0	0	311
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	1.50	1.37	1.39	0.88	0.60	0.84	0.86	0.42	1.53	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St

2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1760	514
v/c Ratio	0.22	0.22	0.83	0.94	0.60
Control Delay	23.5	23.1	28.5	22.7	16.2
Queue Delay	1.2	0.7	2.2	2.3	0.0
Total Delay	24.7	23.8	30.8	25.0	16.2
Queue Length 50th (ft)	79	82	312	645	334
Queue Length 95th (ft)	127	114	370	#795	460
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	134	279	0	49	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.97	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street

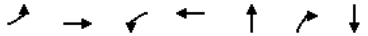
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1171	43	862	359	337	40	308	107
v/c Ratio	1.02	1.07	0.42	1.00	0.87	0.78	0.10	0.76	0.25
Control Delay	130.2	74.5	43.6	58.1	44.9	36.4	21.2	34.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	74.5	43.6	58.1	44.9	36.4	21.2	34.0	6.7
Queue Length 50th (ft)	~52	~314	18	~208	144	130	13	118	0
Queue Length 95th (ft)	#142	#436	#51	#319	#284	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	108	1092	103	865	428	448	421	443	451
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.07	0.42	1.00	0.84	0.75	0.10	0.70	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street
2030 Plus Alt#3 SAT

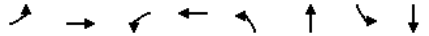


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1605	190	1496	469	238	79
v/c Ratio	0.34	1.20	1.19	0.87	1.06	0.48	0.31
Control Delay	58.3	123.3	129.3	22.4	97.0	16.0	30.5
Queue Delay	0.0	179.2	0.0	115.3	0.0	0.3	0.0
Total Delay	58.3	302.5	129.3	137.7	97.0	16.3	30.5
Queue Length 50th (ft)	11	~615	~144	344	~330	45	42
Queue Length 95th (ft)	m28	#952	m#105	m#496	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	522	0	0	0
Spillback Cap Reductn	0	333	0	0	0	40	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.60	1.19	1.26	1.06	0.52	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue
2030 Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1383	78	858	690	1232	170	1504
v/c Ratio	0.90	1.25	0.76	1.05	1.26	1.00	0.80	1.43
Control Delay	61.1	129.1	84.2	82.0	166.3	59.5	59.7	226.9
Queue Delay	0.0	35.3	0.0	57.2	409.3	0.0	0.0	1.2
Total Delay	61.1	164.4	84.2	139.2	575.7	59.5	59.7	228.1
Queue Length 50th (ft)	113	~564	50	~319	~285	~451	105	~687
Queue Length 95th (ft)	m135	m#432	#128	#444	#398	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1107	106	819	549	1232	239	1054
Starvation Cap Reductn	0	66	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	96	231	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.33	0.74	1.19	2.17	1.00	0.71	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #4
BASE YEAR

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1182	111	692	99	237	64	210	202
v/c Ratio	0.97	0.68	0.64	0.68	0.53	0.62	0.24	0.76	0.50
Control Delay	68.2	23.1	46.8	52.7	50.5	45.1	42.0	54.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	23.1	46.8	52.7	50.5	45.1	42.0	54.6	9.2
Queue Length 50th (ft)	375	315	78	271	67	77	40	143	0
Queue Length 95th (ft)	#596	438	m119	#354	119	115	79	220	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1740	193	1011	257	519	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.68	0.58	0.68	0.39	0.46	0.21	0.65	0.46

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	754	141	601	123	825
v/c Ratio	0.45	0.71	0.89	0.67	0.43	0.48	0.56
Control Delay	15.0	16.3	36.4	54.1	26.4	50.1	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	16.3	36.4	54.1	26.4	50.1	27.5
Queue Length 50th (ft)	15	107	256	96	157	81	225
Queue Length 95th (ft)	m15	65	293	160	240	141	346
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	213	1522	1052	257	1397	257	1476
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.57	0.72	0.55	0.43	0.48	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	137	39	309	25	501
v/c Ratio	0.71	0.46	0.20	0.28	0.14	0.49
Control Delay	25.2	22.9	18.7	8.0	21.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	22.9	18.7	8.0	21.0	10.3
Queue Length 50th (ft)	51	35	11	28	7	54
Queue Length 95th (ft)	#146	77	31	131	24	191
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	396	301	283	1109	283	1017
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.46	0.14	0.28	0.09	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	436	441	425	376
v/c Ratio	0.28	0.27	0.44	0.25
Control Delay	11.8	2.4	5.4	17.0
Queue Delay	0.0	0.7	5.7	0.0
Total Delay	11.8	3.2	11.1	17.0
Queue Length 50th (ft)	43	8	0	74
Queue Length 95th (ft)	73	m3	m237	105
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1578	1628	958	1509
Starvation Cap Reductn	0	830	464	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.55	0.86	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

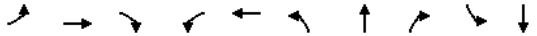
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	378	16	242	233	88	246
v/c Ratio	1.02	0.03	0.56	0.18	0.09	0.47
Control Delay	92.7	22.7	25.7	1.6	11.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.7	22.7	25.7	1.6	11.7	7.6
Queue Length 50th (ft)	~266	5	33	5	25	0
Queue Length 95th (ft)	#453	m20	46	6	52	63
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	972	1236	1323	1014	527
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.02	0.20	0.18	0.09	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

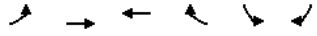
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	397	418	96	42	798	65	328
v/c Ratio	0.03	0.14	0.11	0.61	0.63	0.45	0.04	0.50	0.34	0.65
Control Delay	35.8	36.2	18.2	25.1	25.7	33.2	19.1	1.1	33.5	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.1	25.7	33.2	19.1	1.1	33.5	23.3
Queue Length 50th (ft)	2	10	0	152	162	40	7	0	27	125
Queue Length 95th (ft)	14	36	20	#368	#394	95	19	0	71	229
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	400	421	370	728	737	388	1360	1583	496	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.55	0.57	0.25	0.03	0.50	0.13	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	927	843	139
v/c Ratio	0.38	0.20	0.54	0.64	0.85	0.25
Control Delay	39.3	4.8	19.6	7.8	35.1	4.7
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	39.3	4.8	20.1	7.8	35.2	4.7
Queue Length 50th (ft)	72	28	107	259	259	0
Queue Length 95th (ft)	129	59	m206	m373	300	39
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2155	1362	1441	1373	717
Starvation Cap Reductn	0	0	279	0	0	0
Spillback Cap Reductn	0	1	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.20	0.68	0.64	0.62	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	999	1026	322	582	685	672
v/c Ratio	0.25	0.42	0.69	0.44	0.91	1.08	0.94
Control Delay	25.2	9.2	20.1	2.8	50.1	85.5	47.7
Queue Delay	0.0	2.1	0.2	0.0	0.0	2.7	0.6
Total Delay	25.2	11.2	20.3	2.8	50.1	88.2	48.3
Queue Length 50th (ft)	18	155	128	1	364	~479	388
Queue Length 95th (ft)	m44	141	159	10	#587	#724	#650
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	726	639	634	712
Starvation Cap Reductn	0	1194	0	0	0	0	0
Spillback Cap Reductn	0	117	67	0	0	4	4
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.84	0.72	0.44	0.91	1.09	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	748	1201	347	49	647	182	24	25	46	173	670
v/c Ratio	1.07	0.85	0.38	0.38	0.68	0.39	0.21	0.22	0.31	0.32	0.44
Control Delay	91.3	22.1	1.4	38.4	25.9	14.5	44.7	44.8	15.3	30.8	7.6
Queue Delay	18.5	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.8	23.8	1.6	38.4	25.9	14.5	44.7	44.8	15.3	30.8	7.6
Queue Length 50th (ft)	~275	276	7	28	113	35	15	16	0	91	3
Queue Length 95th (ft)	m#375	m#479	m12	m43	145	m65	41	43	34	141	81
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	699	1416	913	142	956	470	185	186	215	539	1523
Starvation Cap Reductn	0	95	124	0	0	0	0	0	0	0	63
Spillback Cap Reductn	29	0	0	0	0	9	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.91	0.44	0.35	0.68	0.39	0.13	0.13	0.21	0.32	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	444	110
v/c Ratio	0.03	0.03	0.14	0.08	0.22	0.29	0.17
Control Delay	19.4	19.0	2.4	45.0	19.4	18.4	36.2
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.4	36.2
Queue Length 50th (ft)	8	9	0	4	0	92	69
Queue Length 95th (ft)	26	22	21	19	24	127	115
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1554	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.29	0.17

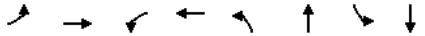
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	652	37	524	293	216	28	153	101
v/c Ratio	0.78	0.39	0.28	0.65	0.82	0.58	0.12	0.63	0.34
Control Delay	34.4	12.3	46.6	38.2	46.7	37.2	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	12.3	46.6	38.2	46.7	37.2	31.3	38.9	9.9
Queue Length 50th (ft)	261	133	22	155	181	123	16	95	0
Queue Length 95th (ft)	m#435	m230	54	212	277	200	29	100	39
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	492	1653	159	809	414	434	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.39	0.23	0.65	0.71	0.50	0.08	0.39	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

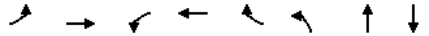
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	304	97	459	112	548	53	702
v/c Ratio	0.63	0.52	0.59	0.72	0.61	0.28	0.41	0.39
Control Delay	65.8	30.0	50.0	38.9	45.6	14.1	45.9	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	30.0	50.0	38.9	45.6	14.1	45.9	17.8
Queue Length 50th (ft)	47	71	60	145	69	96	33	143
Queue Length 95th (ft)	#108	110	111	185	120	158	70	230
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	898	212	1058	301	1940	230	1779
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.34	0.46	0.43	0.37	0.28	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



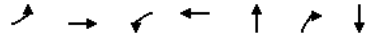
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	239	47	334	66	98	91	38
v/c Ratio	0.25	0.12	0.38	0.16	0.07	0.52	0.43	0.16
Control Delay	48.0	11.5	50.1	11.9	4.9	43.3	30.4	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	11.5	50.1	11.9	4.9	43.3	30.4	28.6
Queue Length 50th (ft)	16	28	29	33	0	61	38	17
Queue Length 95th (ft)	42	76	64	113	27	109	85	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1964	140	2121	975	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.12	0.34	0.16	0.07	0.21	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	210	55	404	220	140	250	42	80	149
v/c Ratio	0.28	0.13	0.42	0.22	0.24	0.68	0.59	0.13	0.62	0.44
Control Delay	46.9	15.7	48.9	17.3	4.1	49.2	34.5	9.0	63.9	31.9
Queue Delay	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.7	48.9	17.8	4.6	49.2	34.5	9.0	63.9	31.9
Queue Length 50th (ft)	19	27	34	67	0	87	156	0	52	91
Queue Length 95th (ft)	47	71	71	142	50	146	188	25	#112	94
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1672	164	1816	920	266	671	489	142	537
Starvation Cap Reductn	0	0	0	946	383	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.34	0.46	0.41	0.53	0.37	0.09	0.56	0.28

Intersection Summary

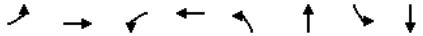
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	315	75	617	164	120	37
v/c Ratio	0.04	0.17	0.53	0.29	0.87	0.28	0.26
Control Delay	47.3	17.8	49.7	8.2	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.8	49.7	8.4	52.9	6.6	37.5
Queue Length 50th (ft)	2	57	44	22	99	0	21
Queue Length 95th (ft)	11	121	m84	202	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1803	195	2100	237	515	323
Starvation Cap Reductn	0	0	0	699	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.38	0.44	0.69	0.23	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	319	32	494	282	785	147	795
v/c Ratio	0.62	0.51	0.18	0.80	0.59	0.46	0.73	0.49
Control Delay	60.6	39.0	46.1	43.0	45.8	21.0	47.6	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	39.0	46.1	43.0	45.8	21.0	47.6	21.9
Queue Length 50th (ft)	45	42	18	115	88	181	92	193
Queue Length 95th (ft)	123	142	m47	190	130	293	149	282
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1025	193	759	481	1716	301	1614
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.31	0.17	0.65	0.59	0.46	0.49	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	339	7	497	145	318
v/c Ratio	0.27	0.15	0.05	0.24	0.27	0.60
Control Delay	12.6	5.7	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	5.7	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	47	2	21	16	36
Queue Length 95th (ft)	m22	89	11	70	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2249	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.24	0.24	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1043	862
v/c Ratio	0.57	0.58	0.45	0.37
Control Delay	46.2	43.7	9.9	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.9	9.0
Queue Length 50th (ft)	58	76	159	121
Queue Length 95th (ft)	92	112	245	189
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.45	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	506	759
v/c Ratio	0.34	0.97	0.26	0.25
Control Delay	25.4	32.6	11.1	10.7
Queue Delay	0.0	0.0	0.8	0.0
Total Delay	25.4	32.6	11.8	10.7
Queue Length 50th (ft)	92	250	85	87
Queue Length 95th (ft)	130	#502	116	112
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1298	801	1956	3015
Starvation Cap Reductn	0	0	1084	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.90	0.58	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	546	240	542
v/c Ratio	0.51	0.28	0.48	0.20
Control Delay	22.3	9.0	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	9.0	28.9	3.2
Queue Length 50th (ft)	41	56	50	25
Queue Length 95th (ft)	71	101	78	45
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1952	638	2689
Starvation Cap Reductn	0	0	0	1595
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.28	0.38	0.50

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	817	114	867	193	578	141	285	501
v/c Ratio	0.87	0.60	0.61	0.80	0.61	0.91	0.44	0.84	0.83
Control Delay	61.6	29.2	68.5	28.2	48.8	57.7	43.0	57.4	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	29.2	68.5	28.2	48.8	57.7	43.0	57.4	21.5
Queue Length 50th (ft)	194	241	77	282	134	208	87	192	75
Queue Length 95th (ft)	#330	318	m114	#433	m184	m#276	149	#315	#252
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1357	225	1086	322	645	354	373	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.60	0.51	0.80	0.60	0.90	0.40	0.76	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	855	187	1133	197	998
v/c Ratio	0.79	0.71	0.87	0.76	0.75	0.82	0.67
Control Delay	46.6	33.0	35.5	58.7	31.9	72.7	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	33.0	35.5	58.7	31.9	72.7	30.0
Queue Length 50th (ft)	77	304	295	126	334	137	288
Queue Length 95th (ft)	m116	m332	307	#217	#577	#258	#493
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	175	1518	1306	274	1503	241	1492
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.53	0.65	0.68	0.75	0.82	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	478	186	177	699	21	502
v/c Ratio	1.12	0.40	0.80	0.72	0.12	0.75
Control Delay	104.8	17.7	45.7	18.3	22.4	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.8	17.7	45.7	18.3	22.4	22.3
Queue Length 50th (ft)	~185	45	58	191	8	115
Queue Length 95th (ft)	#342	92	m#127	#444	m16	173
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	426	468	225	972	225	666
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.40	0.79	0.72	0.09	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	979	492	380	778
v/c Ratio	0.61	0.31	0.43	0.52
Control Delay	12.3	2.8	2.2	23.1
Queue Delay	1.9	0.6	1.8	0.1
Total Delay	14.1	3.4	3.9	23.2
Queue Length 50th (ft)	139	12	27	201
Queue Length 95th (ft)	177	m12	m20	258
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1614	1609	884	1489
Starvation Cap Reductn	451	721	338	0
Spillback Cap Reductn	215	0	15	122
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.55	0.70	0.57

Intersection Summary

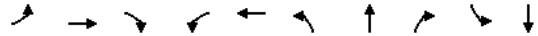
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	362	37	513	693	279	466
v/c Ratio	0.89	0.05	0.64	0.53	0.35	0.84
Control Delay	27.4	0.1	21.0	6.9	24.8	27.3
Queue Delay	0.2	0.0	0.1	0.0	0.0	0.2
Total Delay	27.7	0.1	21.1	6.9	24.8	27.5
Queue Length 50th (ft)	50	0	88	390	132	148
Queue Length 95th (ft)	#263	m0	112	533	229	277
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	962	1155	1301	797	603
Starvation Cap Reductn	5	0	0	0	0	0
Spillback Cap Reductn	0	0	86	0	0	6
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.04	0.48	0.53	0.35	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

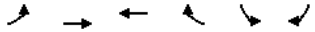


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	274	289	12	711	1566	274	622
v/c Ratio	0.58	1.19	0.21	0.77	0.80	0.13	0.86	0.99	0.84	0.76
Control Delay	44.9	146.2	28.2	39.5	40.5	47.0	41.1	23.3	45.7	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	146.2	28.2	39.5	40.5	47.0	41.1	23.3	45.7	29.3
Queue Length 50th (ft)	104	~306	23	158	169	7	210	0	154	273
Queue Length 95th (ft)	#202	#524	64	257	271	26	#333	#238	#281	#585
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	321	338	305	453	455	250	901	1583	400	819
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.19	0.21	0.60	0.64	0.05	0.79	0.99	0.69	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1352	1243	871	359
v/c Ratio	0.47	0.46	0.99dr	0.89	0.87	0.51
Control Delay	45.8	4.9	19.1	20.8	42.1	6.4
Queue Delay	0.0	0.0	204.2	0.0	0.4	0.0
Total Delay	45.8	4.9	223.3	20.8	42.5	6.4
Queue Length 50th (ft)	97	66	449	719	298	12
Queue Length 95th (ft)	163	117	m369	m557	359	81
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2270	1446	1399	1124	743
Starvation Cap Reductn	0	0	520	0	0	0
Spillback Cap Reductn	0	8	0	0	45	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.46	1.46	0.89	0.81	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1146	1998	526	598	779	535
v/c Ratio	0.45	0.77	1.18	0.70	1.06	1.34	1.53
Control Delay	65.3	13.5	117.0	9.5	90.5	190.7	278.1
Queue Delay	0.0	2.2	189.5	0.6	10.9	2.0	0.0
Total Delay	65.3	15.6	306.5	10.2	101.4	192.7	278.1
Queue Length 50th (ft)	110	73	~675	59	~488	~736	~891
Queue Length 95th (ft)	m155	100	m#692	m62	#716	#997	#852
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	753	565	583	349
Starvation Cap Reductn	0	209	111	51	0	0	0
Spillback Cap Reductn	0	92	444	0	15	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.90	1.61	0.75	1.09	1.34	1.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	653	925	636	282	1075	242	78	82	72	479	1180
v/c Ratio	1.23	0.92	0.90	1.03	1.01	0.48	0.36	0.38	0.27	0.97	0.98
Control Delay	151.5	39.1	19.8	108.6	69.5	29.2	50.2	50.5	24.8	62.3	31.5
Queue Delay	0.0	3.9	2.1	0.0	285.0	0.0	0.0	0.0	0.0	82.2	55.4
Total Delay	151.5	43.0	21.9	108.6	354.5	29.2	50.2	50.5	24.8	144.5	86.9
Queue Length 50th (ft)	~298	290	300	~214	~408	113	63	66	20	296	92
Queue Length 95th (ft)	m#288	m290	m324	#382	#554	191	116	121	68	#541	#431
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	506	214	217	264	492	1208
Starvation Cap Reductn	0	44	21	0	0	0	0	0	0	94	24
Spillback Cap Reductn	0	0	0	0	418	0	0	0	0	0	169
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.96	0.93	1.03	1.67	0.48	0.36	0.38	0.27	1.20	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1048	316
v/c Ratio	0.13	0.12	0.46	0.42	0.51	0.65	0.47
Control Delay	30.3	29.2	6.4	50.5	12.6	25.6	43.3
Queue Delay	1.3	0.0	0.8	0.0	0.0	0.0	0.0
Total Delay	31.6	29.2	7.2	50.5	12.6	25.6	43.3
Queue Length 50th (ft)	51	49	1	35	0	293	230
Queue Length 95th (ft)	102	82	151	73	52	366	314
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1703	241	307	1603	668
Starvation Cap Reductn	377	0	572	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.68	0.21	0.34	0.65	0.47

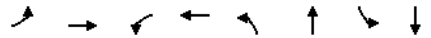
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	974	22	694	559	484	63	215	170
v/c Ratio	1.14	0.94	0.24	0.95	0.76	0.63	0.25	0.82	0.47
Control Delay	160.0	54.3	55.7	66.0	36.6	31.2	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	7.6	2.7	0.0	0.0	0.0
Total Delay	160.0	54.3	55.7	66.0	44.1	33.8	43.8	49.2	12.1
Queue Length 50th (ft)	~153	324	15	253	302	249	39	134	3
Queue Length 95th (ft)	#295	#548	42	#373	#583	456	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1038	97	731	732	763	499	525	556
Starvation Cap Reductn	0	0	0	0	135	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.94	0.23	0.95	0.94	0.82	0.13	0.41	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

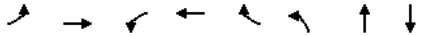


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	856	109	488	152	1189	122	1053
v/c Ratio	0.76	0.88	0.64	0.56	0.71	0.91	0.69	0.85
Control Delay	59.5	40.8	49.9	29.8	47.6	40.6	53.4	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	40.8	49.9	29.8	47.6	40.6	53.4	37.6
Queue Length 50th (ft)	78	232	60	117	83	~386	67	307
Queue Length 95th (ft)	#165	#338	113	165	145	#520	#137	#467
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	981	197	977	256	1306	197	1232
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.87	0.55	0.50	0.59	0.91	0.62	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	896	87	648	29	226	232	182
v/c Ratio	0.25	0.58	0.57	0.36	0.04	0.75	0.70	0.65
Control Delay	48.1	25.4	57.5	19.8	9.9	41.6	32.5	39.3
Queue Delay	0.0	1.6	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	48.1	27.0	57.5	20.4	9.9	41.6	32.5	39.3
Queue Length 50th (ft)	16	207	53	103	0	140	112	109
Queue Length 95th (ft)	42	#456	#120	272	23	195	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1542	158	1809	789	478	492	492
Starvation Cap Reductn	0	444	0	757	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.82	0.55	0.62	0.04	0.47	0.47	0.37

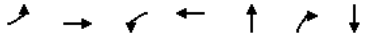
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	731	153	541	198	204	303	125	225	393
v/c Ratio	0.39	0.58	0.75	0.36	0.26	0.96	0.68	0.27	1.06	0.90
Control Delay	46.8	28.1	57.1	22.4	4.5	98.3	38.1	6.2	120.1	42.7
Queue Delay	0.0	1.2	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	29.3	57.1	23.2	4.9	98.3	38.1	6.2	120.1	42.7
Queue Length 50th (ft)	31	194	94	125	0	131	174	0	~158	234
Queue Length 95th (ft)	67	275	#177	192	48	#273	251	42	#309	292
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1269	231	1511	751	212	540	530	212	531
Starvation Cap Reductn	0	307	0	633	234	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.76	0.66	0.62	0.38	0.96	0.56	0.24	1.06	0.74

Intersection Summary

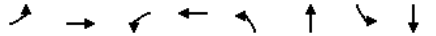
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	977	135	861	328	255	191
v/c Ratio	0.18	0.75	0.70	0.59	0.86	0.50	0.71
Control Delay	40.0	34.2	52.1	18.6	47.6	8.6	45.0
Queue Delay	0.0	19.9	0.0	0.4	0.0	0.0	0.0
Total Delay	40.0	54.1	52.1	19.0	47.6	8.6	45.0
Queue Length 50th (ft)	19	278	91	110	201	12	115
Queue Length 95th (ft)	47	#510	m54	m#288	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1305	301	1454	452	562	348
Starvation Cap Reductn	0	347	0	188	0	0	0
Spillback Cap Reductn	0	23	0	0	0	7	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.02	0.45	0.68	0.73	0.46	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	932	50	592	459	1051	241	1163
v/c Ratio	0.92	0.94	0.52	0.92	1.03	0.78	0.95	0.85
Control Delay	56.6	39.7	61.3	49.0	94.0	32.6	90.0	34.9
Queue Delay	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	56.6	43.5	61.3	49.0	94.0	32.6	90.0	35.8
Queue Length 50th (ft)	142	82	33	184	~162	311	155	353
Queue Length 95th (ft)	m#228	#376	m71	#251	#261	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	251	990	106	678	446	1345	253	1373
Starvation Cap Reductn	0	32	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.97	0.47	0.87	1.03	0.78	0.95	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	739	10	597	276	377
v/c Ratio	0.10	0.33	0.07	0.27	0.49	0.66
Control Delay	20.6	6.6	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	6.6	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	101	3	27	35	36
Queue Length 95th (ft)	m7	m113	14	81	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2221	248	2177	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.04	0.27	0.43	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1295	1450
v/c Ratio	0.69	0.63	0.60	0.67
Control Delay	46.8	43.3	14.4	15.9
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.9	15.9
Queue Length 50th (ft)	90	88	256	309
Queue Length 95th (ft)	131	127	381	457
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2171	2165
Starvation Cap Reductn	0	0	392	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.73	0.67

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	923	1354
v/c Ratio	0.31	1.02	0.47	0.44
Control Delay	25.4	67.5	10.6	9.8
Queue Delay	0.1	0.0	5.5	0.1
Total Delay	25.5	67.5	16.1	9.9
Queue Length 50th (ft)	75	~282	138	135
Queue Length 95th (ft)	111	#502	182	166
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	585	1945	3103
Starvation Cap Reductn	0	0	948	0
Spillback Cap Reductn	148	0	0	563
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.02	0.93	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	951	643	797
v/c Ratio	0.82	0.61	0.82	0.32
Control Delay	44.3	26.5	43.5	6.7
Queue Delay	0.3	0.8	12.7	2.0
Total Delay	44.6	27.3	56.2	8.7
Queue Length 50th (ft)	216	262	223	98
Queue Length 95th (ft)	272	386	270	144
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1514
Spillback Cap Reductn	36	313	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.76	0.97	0.80

Intersection Summary

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	1081	490	570	628
v/c Ratio	0.62	0.33	0.61	0.46
Control Delay	8.3	11.5	10.3	24.5
Queue Delay	2.1	1.2	19.8	0.1
Total Delay	10.3	12.7	30.1	24.6
Queue Length 50th (ft)	69	114	325	165
Queue Length 95th (ft)	101	m86	m284	217
Internal Link Dist (ft)	342	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1733	1480	942	1355
Starvation Cap Reductn	478	739	372	0
Spillback Cap Reductn	285	0	106	122
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.86	0.66	1.00	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

1010: Shellmound Way & Shellmound St

Existing Plus Alt#4 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	525	55	717	924	292	380
v/c Ratio	1.05	0.06	0.82	0.77	0.44	0.35
Control Delay	73.5	0.1	17.6	23.1	31.3	8.0
Queue Delay	11.1	0.0	0.1	4.0	0.0	0.0
Total Delay	84.6	0.1	17.8	27.1	31.3	8.0
Queue Length 50th (ft)	~385	0	193	647	157	83
Queue Length 95th (ft)	#602	m1	m206	m765	261	162
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1069	1186	1202	659	1086
Starvation Cap Reductn	14	0	0	199	0	0
Spillback Cap Reductn	0	0	60	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.05	0.64	0.92	0.44	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

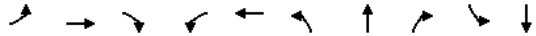
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#4 SAT



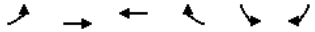
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	463	450	45	278	1149	130	473
v/c Ratio	0.20	0.16	0.06	0.70	0.68	0.30	0.31	0.73	0.58	0.79
Control Delay	35.7	35.6	20.7	30.7	29.6	35.3	23.1	2.9	32.6	28.2
Queue Delay	0.0	0.0	0.0	1.1	0.9	0.0	0.0	0.0	0.0	0.6
Total Delay	35.7	35.6	20.7	31.8	30.5	35.3	23.1	2.9	32.6	28.8
Queue Length 50th (ft)	13	11	0	222	212	21	54	0	61	202
Queue Length 95th (ft)	39	34	13	#434	#417	54	96	0	115	#380
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	344	362	314	658	659	327	1119	1583	456	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	15	61	61	0	0	0	0	59
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.78	0.75	0.14	0.25	0.73	0.29	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

Existing Plus Alt#4 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	749	997	1078	263
v/c Ratio	0.68	0.15	0.52	0.71	0.89	0.37
Control Delay	51.4	12.2	17.5	15.6	35.3	4.3
Queue Delay	0.0	0.0	2.8	0.0	6.7	0.0
Total Delay	51.4	12.2	20.3	15.6	42.0	4.3
Queue Length 50th (ft)	85	48	220	517	363	7
Queue Length 95th (ft)	141	83	302	673	399	54
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2029	1429	1399	1592	867
Starvation Cap Reductn	0	0	543	0	254	0
Spillback Cap Reductn	0	0	0	0	463	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.15	0.85	0.71	0.95	0.30

Intersection Summary

Queues
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1254	1341	470	404	636	613
v/c Ratio	0.74	1.05	0.80	0.57	0.55	0.80	1.56
Control Delay	67.5	60.5	30.6	5.3	26.5	23.1	288.8
Queue Delay	0.0	144.1	0.8	0.2	0.3	0.0	0.0
Total Delay	67.5	204.6	31.4	5.5	26.9	23.1	288.8
Queue Length 50th (ft)	69	~363	336	39	217	241	~1049
Queue Length 95th (ft)	m116	#438	404	m63	320	437	#950
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1678	827	734	795	392
Starvation Cap Reductn	0	288	118	52	0	0	0
Spillback Cap Reductn	0	0	66	0	64	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.38	0.86	0.61	0.60	0.80	1.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave

Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	751	1109	620	293	480	247	153	161	110	517	1071
v/c Ratio	1.27	0.95	1.01	1.07	0.45	0.44	0.84	0.86	0.42	1.04	0.80
Control Delay	166.5	29.9	30.9	119.0	32.9	15.3	91.5	93.8	26.5	79.4	26.8
Queue Delay	79.1	2.4	1.3	0.0	0.1	0.3	0.0	0.0	0.0	88.8	2.0
Total Delay	245.7	32.3	32.2	119.0	32.9	15.6	91.5	93.8	26.5	168.2	28.8
Queue Length 50th (ft)	~342	244	~215	~230	144	53	121	127	25	~406	350
Queue Length 95th (ft)	m#308	m220	m188	#401	193	127	m#235	m#249	m69	#596	428
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1169	616	274	1062	559	183	188	261	497	1344
Starvation Cap Reductn	0	25	3	0	0	0	0	0	0	86	146
Spillback Cap Reductn	73	0	0	0	53	57	0	0	0	0	24
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.44	0.97	1.01	1.07	0.48	0.49	0.84	0.86	0.42	1.26	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St

Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1420	350
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.87	0.53
Control Delay	31.3	30.4	33.0	50.5	12.1	23.9	33.7
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.2	0.0
Total Delay	32.6	31.1	35.0	50.5	12.6	24.1	33.7
Queue Length 50th (ft)	67	69	260	38	0	522	236
Queue Length 95th (ft)	135	117	381	78	57	622	353
Internal Link Dist (ft)		150				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1639	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	11	0	0	0	38	18	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.45	0.88	0.53

Intersection Summary

Queues
1016: Powell St & Hollis Street

Existing Plus Alt#4 SAT

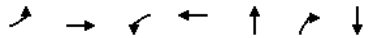
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	733	40	691	252	187	38	190	97
v/c Ratio	0.56	0.46	0.33	0.49	0.67	0.47	0.11	0.54	0.26
Control Delay	50.1	17.6	37.9	22.2	26.5	22.6	21.3	25.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	17.6	37.9	22.2	26.5	22.6	21.3	25.0	6.8
Queue Length 50th (ft)	27	89	15	122	85	57	12	64	0
Queue Length 95th (ft)	#93	#224	44	#228	164	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	129	1588	123	1424	467	487	458	482	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.46	0.33	0.49	0.54	0.38	0.08	0.39	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

Existing Plus Alt#4 SAT



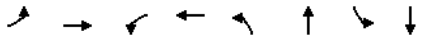
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1042	165	1072	204	197	59
v/c Ratio	0.32	0.63	1.04	0.53	0.72	0.48	0.24
Control Delay	62.4	14.5	104.6	13.6	42.4	7.0	27.7
Queue Delay	0.0	0.3	0.0	1.2	0.0	0.0	0.0
Total Delay	62.4	14.8	104.6	14.8	42.4	7.0	27.7
Queue Length 50th (ft)	14	41	~116	67	126	0	27
Queue Length 95th (ft)	m22	#538	m#169	m#431	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1660	159	2034	441	530	445
Starvation Cap Reductn	0	0	0	677	0	0	0
Spillback Cap Reductn	0	164	0	0	0	9	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.70	1.04	0.79	0.46	0.38	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

Existing Plus Alt#4 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	942	75	538	522	728	123	943
v/c Ratio	0.80	0.85	0.74	0.64	0.95	0.57	0.68	0.91
Control Delay	63.6	18.5	80.7	37.3	70.6	27.8	50.5	45.3
Queue Delay	0.0	1.5	0.0	0.7	15.8	0.0	0.0	0.1
Total Delay	63.6	20.1	80.7	38.1	86.4	27.8	50.5	45.4
Queue Length 50th (ft)	84	266	48	160	171	192	77	292
Queue Length 95th (ft)	#217	#362	#121	218	#273	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1109	106	839	549	1287	239	1041
Starvation Cap Reductn	0	61	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	39	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.90	0.71	0.72	1.02	0.57	0.51	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #4
2010

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1241	109	813	127	304	64	234	208
v/c Ratio	0.97	0.75	0.63	0.87	0.60	0.70	0.23	0.80	0.49
Control Delay	67.5	26.5	49.8	56.1	52.2	46.7	41.6	58.3	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	26.5	49.8	56.1	52.2	46.7	41.6	58.3	9.2
Queue Length 50th (ft)	374	367	79	321	86	100	39	158	0
Queue Length 95th (ft)	#593	481	m98	#464	146	143	79	#264	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1664	193	930	257	521	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.75	0.56	0.87	0.49	0.58	0.21	0.73	0.47

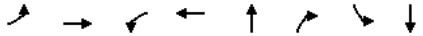
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	787	204	777	124	983
v/c Ratio	0.75	0.69	0.90	0.83	0.59	0.48	0.74
Control Delay	24.3	14.6	36.3	68.5	30.9	50.2	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	14.6	36.3	68.5	30.9	50.2	34.5
Queue Length 50th (ft)	23	77	261	141	228	82	312
Queue Length 95th (ft)	m31	88	316	#258	322	142	#466
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	201	1522	1031	257	1316	257	1334
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.76	0.79	0.59	0.48	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	69	161	167	213	91	125	436
v/c Ratio	0.33	0.36	0.25	0.25	0.65	0.25	0.55	0.65
Control Delay	38.4	37.2	1.1	0.4	33.1	8.1	37.0	21.3
Queue Delay	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0
Total Delay	38.4	37.2	1.2	0.6	33.1	8.1	37.0	21.3
Queue Length 50th (ft)	27	30	2	0	94	0	56	164
Queue Length 95th (ft)	79	86	2	0	202	41	136	310
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	490	512	951	944	623	608	490	1226
Starvation Cap Reductn	0	0	290	312	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.13	0.24	0.26	0.34	0.15	0.26	0.36

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	281	26	266	73
v/c Ratio	0.19	0.33	0.68	0.41
Control Delay	0.7	39.8	35.7	36.3
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	1.2	39.8	35.7	36.3
Queue Length 50th (ft)	6	10	113	30
Queue Length 95th (ft)	8	46	#288	88
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1580	103	516	489
Starvation Cap Reductn	881	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.25	0.52	0.15

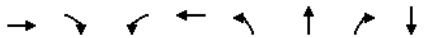
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	312	161	38	323	24	581
v/c Ratio	0.85	0.53	0.19	0.29	0.14	0.57
Control Delay	39.9	24.9	18.4	7.8	20.9	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	24.9	18.4	7.8	20.9	12.3
Queue Length 50th (ft)	67	42	10	30	7	66
Queue Length 95th (ft)	#188	#89	27	137	23	#277
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	368	304	283	1109	283	1016
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.53	0.13	0.29	0.08	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	257	239	62	403	407	426
v/c Ratio	0.65	0.59	0.96	0.88	0.10	0.17	0.34	0.20
Control Delay	72.9	20.3	98.8	84.2	0.4	0.4	2.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Delay	72.9	20.3	98.8	84.2	0.4	0.4	3.2	6.8
Queue Length 50th (ft)	45	0	181	164	1	2	2	49
Queue Length 95th (ft)	#112	56	#341	#305	m0	m1	m60	69
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	271	612	2339	1184	2175
Starvation Cap Reductn	0	0	0	0	0	0	475	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.96	0.88	0.10	0.17	0.57	0.20

Intersection Summary

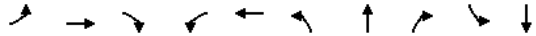
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	362	45	266	291	99	280
v/c Ratio	0.97	0.08	0.72	0.22	0.09	0.51
Control Delay	83.9	20.8	35.8	2.2	11.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.9	20.8	35.8	2.2	11.0	7.7
Queue Length 50th (ft)	250	13	69	5	27	0
Queue Length 95th (ft)	#430	m46	108	7	55	67
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	983	1236	1323	1049	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.05	0.22	0.22	0.09	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

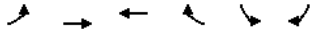
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	448	473	93	93	981	80	336
v/c Ratio	0.04	0.16	0.13	0.66	0.69	0.47	0.09	0.62	0.44	0.72
Control Delay	35.8	36.0	18.1	28.7	29.8	34.0	19.5	1.8	33.9	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	18.1	28.7	29.8	34.0	19.5	1.8	33.9	25.6
Queue Length 50th (ft)	2	9	0	180	192	39	16	0	34	129
Queue Length 95th (ft)	14	35	20	#436	#468	93	35	0	83	235
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	351	369	327	680	687	351	1223	1583	444	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.05	0.66	0.69	0.26	0.08	0.62	0.18	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	767	1118	965	136
v/c Ratio	0.37	0.21	0.63	0.78	0.86	0.22
Control Delay	39.1	5.8	19.6	14.4	34.1	4.3
Queue Delay	0.0	0.0	1.2	0.0	0.2	0.0
Total Delay	39.1	5.8	20.8	14.4	34.3	4.3
Queue Length 50th (ft)	70	31	98	586	294	0
Queue Length 95th (ft)	126	63	m225	m713	332	36
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2035	1226	1441	1373	715
Starvation Cap Reductn	0	0	246	0	0	0
Spillback Cap Reductn	0	3	0	0	49	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.78	0.78	0.73	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	1114	1242	372	608	702	690
v/c Ratio	0.24	0.47	0.84	0.49	0.95	1.13	0.98
Control Delay	29.7	8.5	21.4	2.6	57.0	104.1	56.9
Queue Delay	0.0	2.2	0.0	0.1	0.0	17.6	16.8
Total Delay	29.7	10.8	21.4	2.8	57.0	121.8	73.7
Queue Length 50th (ft)	21	156	160	12	390	~523	423
Queue Length 95th (ft)	m42	141	255	m15	#627	#771	#692
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	760	639	621	702
Starvation Cap Reductn	0	1093	0	41	0	0	0
Spillback Cap Reductn	0	171	0	0	0	22	41
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.86	0.84	0.52	0.95	1.17	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	704	1375	389	79	782	179	23	24	44	258	794
v/c Ratio	1.02	0.98	0.41	0.61	0.82	0.39	0.20	0.20	0.29	0.48	0.53
Control Delay	77.1	36.3	1.6	60.1	42.5	24.6	44.0	44.0	15.4	39.5	6.9
Queue Delay	0.0	10.1	0.2	0.0	0.3	0.0	0.0	0.0	0.0	2.0	0.0
Total Delay	77.1	46.4	1.8	60.1	42.8	24.6	44.0	44.0	15.4	41.4	6.9
Queue Length 50th (ft)	243	~345	6	49	245	67	14	15	0	136	77
Queue Length 95th (ft)	m#341	m#596	m12	#106	318	129	40	41	32	m175	m96
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	689	1406	929	142	956	462	185	186	213	537	1509
Starvation Cap Reductn	0	59	110	0	0	0	0	0	0	155	22
Spillback Cap Reductn	0	0	0	0	19	0	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.02	0.47	0.56	0.83	0.39	0.12	0.13	0.21	0.68	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	571	149
v/c Ratio	0.07	0.07	0.23	0.25	0.14
Control Delay	26.3	26.0	2.7	7.8	10.1
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.3	26.0	3.5	7.8	10.1
Queue Length 50th (ft)	14	14	0	73	43
Queue Length 95th (ft)	38	31	25	98	60
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1189	2279	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.25	0.14

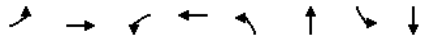
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	782	38	601	313	248	29	212	108
v/c Ratio	0.96	0.51	0.29	0.74	0.84	0.63	0.11	0.74	0.32
Control Delay	75.4	20.8	46.7	41.5	49.0	39.2	28.1	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.4	20.8	46.7	41.5	49.0	39.2	28.1	38.9	10.3
Queue Length 50th (ft)	~284	172	23	184	193	143	13	131	1
Queue Length 95th (ft)	#538	257	55	247	#324	231	30	152	40
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	432	1532	159	810	417	437	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.51	0.24	0.74	0.75	0.57	0.08	0.54	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

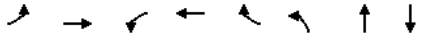
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	419	105	499	134	634	52	872
v/c Ratio	0.80	0.60	0.62	0.72	0.65	0.35	0.41	0.54
Control Delay	87.5	33.5	51.1	38.1	46.2	16.3	45.9	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	33.5	51.1	38.1	46.2	16.3	45.9	22.6
Queue Length 50th (ft)	63	113	65	157	83	120	32	200
Queue Length 95th (ft)	#154	157	118	196	137	195	69	320
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	894	212	1058	301	1812	230	1605
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.47	0.50	0.47	0.45	0.35	0.23	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



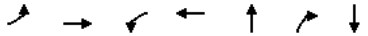
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	379	45	378	186	116	197	88
v/c Ratio	0.24	0.21	0.37	0.19	0.19	0.46	0.74	0.37
Control Delay	47.9	14.8	49.9	14.6	4.0	39.6	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	14.8	49.9	14.6	4.0	39.6	40.7	36.0
Queue Length 50th (ft)	16	56	28	45	0	69	116	50
Queue Length 95th (ft)	42	135	62	141	49	116	180	81
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1839	138	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.21	0.33	0.19	0.19	0.24	0.40	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	338	55	555	233	151	277	41	141	209
v/c Ratio	0.27	0.21	0.42	0.31	0.26	0.71	0.64	0.10	0.99	0.58
Control Delay	46.8	17.7	48.9	18.7	4.0	50.4	34.8	7.4	122.1	31.0
Queue Delay	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.7	48.9	19.5	4.6	50.4	34.8	7.4	122.1	31.0
Queue Length 50th (ft)	18	54	34	102	0	93	171	0	97	98
Queue Length 95th (ft)	46	115	71	196	51	156	209	23	#221	120
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1628	164	1769	908	266	671	596	142	538
Starvation Cap Reductn	0	0	0	860	361	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.21	0.34	0.61	0.43	0.57	0.41	0.07	0.99	0.39

Intersection Summary

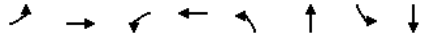
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	481	128	752	247	127	38
v/c Ratio	0.04	0.27	0.67	0.34	0.79	0.34	0.25
Control Delay	47.3	18.2	57.2	8.7	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.4	57.2	8.9	42.7	7.2	36.5
Queue Length 50th (ft)	2	90	83	19	153	0	21
Queue Length 95th (ft)	11	182	m116	m243	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1756	210	2229	487	520	329
Starvation Cap Reductn	0	672	0	707	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.44	0.61	0.49	0.51	0.24	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	460	34	669	336	834	168	974
v/c Ratio	0.63	0.58	0.20	0.89	0.70	0.54	0.77	0.66
Control Delay	61.5	30.6	45.9	47.1	49.6	25.0	49.1	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.5	30.6	45.9	47.1	49.6	25.0	49.1	27.6
Queue Length 50th (ft)	44	53	17	165	106	218	105	275
Queue Length 95th (ft)	120	191	m50	#281	154	318	168	368
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1038	185	802	481	1549	301	1482
Starvation Cap Reductn	0	0	0	0	0	0	0	48
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.44	0.18	0.83	0.70	0.54	0.56	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

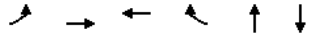
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	437	82	659	240	394
v/c Ratio	0.28	0.23	0.44	0.32	0.40	0.73
Control Delay	16.3	8.7	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	8.7	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	18	81	23	31	25	51
Queue Length 95th (ft)	m30	112	55	96	51	#104
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2045	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.23	0.39	0.32	0.39	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.51	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	658	594	1096	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1156	1109
v/c Ratio	0.77	0.74	0.55	0.53
Control Delay	54.3	46.4	14.6	14.2
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.9	14.2
Queue Length 50th (ft)	94	136	238	223
Queue Length 95th (ft)	#144	185	312	293
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	389	631	2085	2079
Starvation Cap Reductn	0	0	367	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.67	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	572	1067
v/c Ratio	0.43	0.98	0.32	0.38
Control Delay	24.8	49.2	12.9	13.3
Queue Delay	0.0	0.0	2.1	0.0
Total Delay	24.8	49.2	14.9	13.3
Queue Length 50th (ft)	136	330	98	133
Queue Length 95th (ft)	184	#597	133	164
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	769	1796	2795
Starvation Cap Reductn	0	0	1041	0
Spillback Cap Reductn	14	0	0	56
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.98	0.76	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	610	457	632
v/c Ratio	0.68	0.38	0.75	0.26
Control Delay	25.3	13.6	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.6
Total Delay	25.3	13.6	34.4	5.2
Queue Length 50th (ft)	93	84	96	43
Queue Length 95th (ft)	130	136	#143	76
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1613	638	2462
Starvation Cap Reductn	0	0	0	1346
Spillback Cap Reductn	35	26	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.38	0.72	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1023	146	974	204	619	146	333	509
v/c Ratio	0.90	0.81	0.72	0.96	0.63	0.96	0.43	0.92	0.84
Control Delay	67.1	36.9	59.7	46.4	49.5	65.8	42.7	70.3	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.9	59.7	46.4	49.5	65.8	42.7	70.3	24.0
Queue Length 50th (ft)	210	338	100	~390	143	224	91	231	90
Queue Length 95th (ft)	#361	427	m105	m#416	m182	m#297	154	#396	#275
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1269	225	1010	322	646	354	373	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.81	0.65	0.96	0.63	0.96	0.41	0.89	0.83

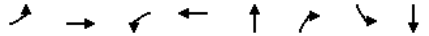
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	927	284	1295	196	1265
v/c Ratio	1.38	0.62	0.88	1.04	1.16	0.81	1.20
Control Delay	225.5	25.7	38.7	110.4	116.8	72.2	135.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	225.5	25.7	38.7	110.4	116.8	72.2	135.3
Queue Length 50th (ft)	~198	314	300	~217	~570	136	~570
Queue Length 95th (ft)	m#273	m374	#433	#386	#709	#257	#708
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	151	1517	1054	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.62	0.88	1.04	1.16	0.81	1.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	167	89	216	351	539	333	94	394
v/c Ratio	0.73	0.37	0.34	0.53	0.97	0.50	0.66	0.52
Control Delay	58.1	49.0	5.2	1.9	74.6	10.2	74.3	29.2
Queue Delay	0.0	0.0	3.6	6.1	0.0	0.0	0.0	0.0
Total Delay	58.1	49.0	8.8	8.0	74.6	10.2	74.3	29.2
Queue Length 50th (ft)	127	63	12	0	418	33	73	221
Queue Length 95th (ft)	203	115	m17	m0	#680	120	#153	335
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	295	310	635	661	554	668	148	763
Starvation Cap Reductn	0	0	328	251	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.29	0.70	0.86	0.97	0.50	0.64	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	510	35	447	141
v/c Ratio	0.33	0.56	1.03	0.87
Control Delay	1.5	78.1	96.0	91.3
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	2.0	78.1	96.0	91.3
Queue Length 50th (ft)	29	24	~377	106
Queue Length 95th (ft)	26	#81	#609	#234
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1549	62	435	166
Starvation Cap Reductn	627	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.56	1.03	0.85

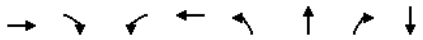
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	553	203	172	738	20	584
v/c Ratio	1.32	0.43	0.78	0.76	0.12	0.87
Control Delay	181.4	18.5	44.3	20.0	22.7	28.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.4	18.5	44.3	20.0	22.7	28.8
Queue Length 50th (ft)	~243	50	56	205	8	136
Queue Length 95th (ft)	#409	101	m#128	#476	m14	m#257
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	420	468	225	972	225	674
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.43	0.76	0.76	0.09	0.87

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	480	454	144	483	379	763
v/c Ratio	0.17	0.55	0.64	0.61	0.88	0.36	0.48	0.61
Control Delay	50.5	18.4	11.2	10.2	48.2	20.2	10.6	29.4
Queue Delay	0.8	1.6	5.9	4.1	0.0	0.7	0.9	0.1
Total Delay	51.3	20.0	17.1	14.3	48.2	21.0	11.5	29.5
Queue Length 50th (ft)	12	3	117	101	65	71	55	222
Queue Length 95th (ft)	35	55	187	m167	m69	m67	m19	287
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	215	754	748	164	1358	791	1253
Starvation Cap Reductn	0	0	36	35	0	538	190	0
Spillback Cap Reductn	48	36	215	212	0	0	22	42
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.56	0.89	0.85	0.88	0.59	0.63	0.63

Intersection Summary

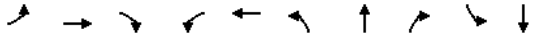
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	361	39	471	743	280	464
v/c Ratio	0.88	0.05	0.66	0.57	0.33	0.83
Control Delay	39.0	2.1	31.5	4.4	23.0	27.3
Queue Delay	1.3	0.0	0.0	0.4	0.0	0.0
Total Delay	40.3	2.1	31.5	4.8	23.0	27.3
Queue Length 50th (ft)	238	0	97	11	130	145
Queue Length 95th (ft)	#377	m2	120	461	222	277
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	962	1155	1298	842	601
Starvation Cap Reductn	24	0	0	175	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.04	0.41	0.66	0.33	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

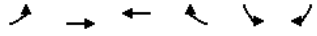


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	361	376	12	738	1678	283	642
v/c Ratio	0.61	1.25	0.22	0.88	0.91	0.14	0.91	1.06	0.86	0.80
Control Delay	48.2	172.0	28.9	51.3	54.3	47.7	48.8	45.4	51.2	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	172.0	28.9	51.3	54.3	47.7	48.8	45.4	51.2	32.9
Queue Length 50th (ft)	109	~322	23	229	241	7	241	~126	171	318
Queue Length 95th (ft)	#193	#506	62	#394	#417	26	#353	#388	#294	#615
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	296	311	282	441	443	235	846	1583	377	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.25	0.22	0.82	0.85	0.05	0.87	1.06	0.75	0.80

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1439	1284	1075	347
v/c Ratio	0.46	0.47	1.12dr	0.92	0.96	0.50
Control Delay	45.4	5.4	41.7	22.9	55.2	10.4
Queue Delay	0.0	0.0	245.2	0.0	4.6	0.0
Total Delay	45.4	5.4	286.8	22.9	59.8	10.4
Queue Length 50th (ft)	94	71	~502	753	380	42
Queue Length 95th (ft)	158	114	m374	m529	#519	124
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2176	1384	1399	1124	694
Starvation Cap Reductn	0	0	483	0	0	0
Spillback Cap Reductn	0	6	0	0	35	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.60	0.92	0.99	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1347	2123	457	601	862	624
v/c Ratio	0.44	0.90	1.26	0.60	1.06	1.45	1.82
Control Delay	64.5	17.2	148.4	5.7	92.1	238.8	405.0
Queue Delay	0.0	44.5	218.2	0.4	33.3	31.0	78.9
Total Delay	64.5	61.8	366.6	6.1	125.4	269.7	483.9
Queue Length 50th (ft)	109	82	~745	25	~493	~851	~1135
Queue Length 95th (ft)	m131	m94	m#716	m22	#723	#1118	#1111
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	761	565	594	342
Starvation Cap Reductn	0	155	104	60	0	0	0
Spillback Cap Reductn	0	260	470	0	41	27	30
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.10	1.74	0.65	1.15	1.52	2.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	702	1123	772	342	1236	316	76	80	69	511	1092
v/c Ratio	1.32	1.11	1.10	1.25	1.16	0.62	0.36	0.37	0.26	1.04	0.90
Control Delay	189.1	89.0	70.7	174.2	119.6	36.1	50.0	50.4	25.1	85.9	21.0
Queue Delay	0.0	23.7	11.3	0.0	338.2	0.0	0.0	0.0	0.0	97.9	34.6
Total Delay	189.1	112.7	82.1	174.2	457.9	36.1	50.0	50.4	25.1	183.8	55.6
Queue Length 50th (ft)	~338	~492	~489	~296	~533	184	61	64	19	~392	174
Queue Length 95th (ft)	m#268	m354	m238	#494	#697	296	113	118	66	#607	#362
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1012	701	274	1062	510	214	217	262	492	1209
Starvation Cap Reductn	0	48	17	0	0	0	0	0	0	92	38
Spillback Cap Reductn	0	0	0	0	418	0	0	0	0	0	189
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	1.16	1.13	1.25	1.92	0.62	0.36	0.37	0.26	1.28	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1215	318
v/c Ratio	0.17	0.17	0.47	0.59	0.52
Control Delay	33.1	31.9	9.7	15.8	40.3
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	35.3	33.2	10.2	15.8	40.3
Queue Length 50th (ft)	61	64	98	266	230
Queue Length 95th (ft)	118	104	157	330	329
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1864	2069	610
Starvation Cap Reductn	352	752	541	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.66	0.59	0.52

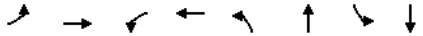
Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1170	21	820	560	565	72	256	160
v/c Ratio	1.24	1.13	0.23	1.12	0.83	0.80	0.24	0.80	0.40
Control Delay	196.6	102.1	55.4	111.1	43.7	41.2	47.3	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	7.0	7.6	0.0	0.0	0.0
Total Delay	196.6	102.1	55.4	111.1	50.7	48.9	47.3	54.1	15.9
Queue Length 50th (ft)	~181	~258	15	~350	341	333	51	187	13
Queue Length 95th (ft)	#330	#684	41	#476	#628	#614	100	273	86
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1037	97	733	677	707	499	525	549
Starvation Cap Reductn	0	0	0	0	83	108	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.13	0.22	1.12	0.94	0.94	0.14	0.49	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

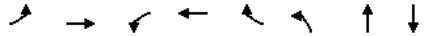


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	924	107	581	188	1408	118	1256
v/c Ratio	0.83	0.93	0.64	0.66	0.80	1.10	0.67	1.08
Control Delay	69.8	47.0	49.4	31.8	55.8	85.9	52.2	81.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	47.0	49.4	31.8	55.8	85.9	52.2	81.5
Queue Length 50th (ft)	90	260	59	146	104	~526	65	~466
Queue Length 95th (ft)	#194	#386	112	201	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	996	197	977	256	1284	197	1166
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.93	0.54	0.59	0.73	1.10	0.60	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	965	84	715	58	255	270	313
v/c Ratio	0.26	0.72	0.58	0.47	0.08	0.79	0.78	0.84
Control Delay	48.8	32.4	58.8	25.9	8.4	42.3	35.6	43.2
Queue Delay	0.0	4.3	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	36.7	58.8	26.4	8.4	42.3	35.6	43.2
Queue Length 50th (ft)	17	271	52	178	0	158	139	191
Queue Length 95th (ft)	44	#509	#127	#332	32	221	206	266
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1340	152	1518	683	478	491	494
Starvation Cap Reductn	0	294	0	385	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.92	0.55	0.63	0.08	0.53	0.55	0.63

Intersection Summary

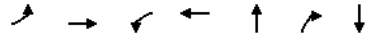
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	855	148	614	246	226	348	140	306	513
v/c Ratio	0.39	0.77	0.74	0.43	0.33	1.07	0.65	0.26	1.44	0.98
Control Delay	46.8	35.8	56.0	24.4	4.5	124.0	37.7	6.0	254.5	62.1
Queue Delay	0.0	8.6	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	44.5	56.0	25.6	4.9	124.0	37.7	6.0	254.5	62.1
Queue Length 50th (ft)	30	257	91	157	0	~160	193	0	~269	323
Queue Length 95th (ft)	64	335	#168	220	53	#308	291	44	#445	#497
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1114	230	1413	744	212	540	540	212	533
Starvation Cap Reductn	0	228	0	536	190	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.97	0.64	0.70	0.44	1.07	0.64	0.26	1.44	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

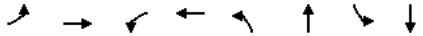


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1190	166	980	336	301	193
v/c Ratio	0.18	0.97	0.75	0.68	0.87	0.56	0.72
Control Delay	39.9	52.7	49.7	20.3	48.4	9.2	45.1
Queue Delay	0.0	102.1	0.0	0.7	0.0	1.7	3.0
Total Delay	39.9	154.7	49.7	21.1	48.4	10.9	48.1
Queue Length 50th (ft)	18	385	103	134	205	17	116
Queue Length 95th (ft)	46	#688	m57	m274	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1233	301	1445	452	589	349
Starvation Cap Reductn	0	272	0	188	0	0	0
Spillback Cap Reductn	0	207	0	0	0	151	80
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.24	0.55	0.78	0.74	0.69	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1139	49	710	523	1282	281	1343
v/c Ratio	0.92	1.12	0.51	1.05	1.17	0.98	1.08	1.00
Control Delay	48.1	91.3	59.7	82.2	138.7	52.7	123.1	55.0
Queue Delay	0.0	15.3	0.0	0.0	39.2	0.0	0.0	13.0
Total Delay	48.1	106.5	59.7	82.2	177.9	52.7	123.1	68.0
Queue Length 50th (ft)	112	~410	32	~250	~206	418	~210	~453
Queue Length 95th (ft)	m#113	m#445	m67	#344	#309	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1014	106	678	446	1307	259	1349
Starvation Cap Reductn	0	31	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	32	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.16	0.46	1.05	1.26	0.98	1.08	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	896	47	713	440	450
v/c Ratio	0.14	0.45	0.26	0.34	0.66	0.83
Control Delay	20.7	9.5	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	9.5	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	130	13	36	50	51
Queue Length 95th (ft)	m9	m140	36	103	88	#117
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	248	2118	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.45	0.19	0.34	0.64	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1617	1704
v/c Ratio	1.08	0.74	0.82	0.86
Control Delay	107.2	47.0	23.4	25.8
Queue Delay	0.0	0.0	2.9	0.0
Total Delay	107.2	47.0	26.3	25.8
Queue Length 50th (ft)	~197	129	445	492
Queue Length 95th (ft)	#306	180	566	627
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1974
Starvation Cap Reductn	0	0	250	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.94	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1110	1639
v/c Ratio	0.45	1.40	0.67	0.53
Control Delay	27.1	214.5	14.1	10.8
Queue Delay	0.3	0.0	34.4	0.4
Total Delay	27.4	214.5	48.5	11.2
Queue Length 50th (ft)	113	~550	200	178
Queue Length 95th (ft)	159	#773	269	215
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	552	1654	3103
Starvation Cap Reductn	0	0	609	0
Spillback Cap Reductn	158	0	0	790
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.40	1.06	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

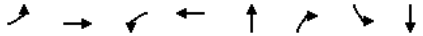
Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1105	788	935
v/c Ratio	0.96	0.83	0.88	0.39
Control Delay	61.0	38.2	46.6	8.6
Queue Delay	27.8	55.1	145.2	5.6
Total Delay	88.7	93.3	191.8	14.2
Queue Length 50th (ft)	308	376	269	139
Queue Length 95th (ft)	#437	#504	341	175
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1327	967	2384
Starvation Cap Reductn	0	0	370	1375
Spillback Cap Reductn	92	337	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.12	1.32	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1004: 65th Street & Shellmound St

2010 Plus Alt#4 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	120	64	233	172	536	317	90	581
v/c Ratio	0.59	0.30	0.42	0.30	1.16	0.48	0.59	0.71
Control Delay	46.4	38.4	12.2	3.4	125.9	11.2	54.4	30.1
Queue Delay	0.0	0.0	0.8	0.6	0.0	0.0	0.0	0.0
Total Delay	46.4	38.4	13.1	4.0	125.9	11.2	54.4	30.1
Queue Length 50th (ft)	76	33	46	5	~441	34	58	313
Queue Length 95th (ft)	145	78	75	25	#759	129	121	#557
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	370	384	753	761	464	666	203	868
Starvation Cap Reductn	0	0	287	331	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.17	0.50	0.40	1.16	0.48	0.44	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1005: 65th Street & Overland Avenue

2010 Plus Alt#4 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	185	42	172	79
v/c Ratio	0.12	0.75	0.49	0.50
Control Delay	0.8	67.3	39.1	44.9
Queue Delay	0.6	0.0	0.0	0.0
Total Delay	1.4	67.3	39.1	44.9
Queue Length 50th (ft)	6	25	98	46
Queue Length 95th (ft)	10	#93	183	101
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1619	78	487	352
Starvation Cap Reductn	1119	0	0	0
Spillback Cap Reductn	0	0	6	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.54	0.36	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1009: Shellmound Way & Christie Ave

2010 Plus Alt#4 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	587	547	164	496	576	697
v/c Ratio	0.14	0.38	0.98	0.93	1.31	0.45	0.73	0.69
Control Delay	35.6	26.1	53.6	42.0	168.2	12.9	9.9	36.8
Queue Delay	0.1	4.7	116.2	91.8	0.0	1.4	31.5	1.0
Total Delay	35.6	30.8	169.9	133.8	168.2	14.2	41.3	37.8
Queue Length 50th (ft)	33	56	436	398	~149	47	110	223
Queue Length 95th (ft)	69	116	#696	#628	m#147	m47	m72	291
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	394	596	589	125	1110	784	1014
Starvation Cap Reductn	0	0	90	89	0	402	232	0
Spillback Cap Reductn	46	181	139	137	0	0	143	124
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.69	1.28	1.21	1.31	0.70	1.04	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St

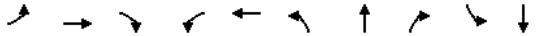
2010 Plus Alt#4 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	532	78	712	1014	315	439
v/c Ratio	1.07	0.08	0.85	0.84	0.46	0.40
Control Delay	78.2	0.9	24.2	33.5	30.9	8.2
Queue Delay	48.2	0.0	0.3	13.9	0.0	0.0
Total Delay	126.4	0.9	24.4	47.4	30.9	8.3
Queue Length 50th (ft)	~420	3	235	768	169	99
Queue Length 95th (ft)	#632	m4	m231	m842	280	194
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1077	1186	1202	683	1106
Starvation Cap Reductn	50	0	0	191	0	0
Spillback Cap Reductn	0	0	104	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.07	0.66	1.00	0.46	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#4 SAT



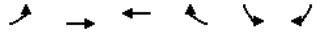
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	569	552	45	329	1415	147	514
v/c Ratio	0.21	0.17	0.06	0.91	0.88	0.31	0.34	0.89	0.63	0.79
Control Delay	35.8	35.6	20.7	48.2	44.1	35.5	23.7	9.5	32.8	29.9
Queue Delay	0.0	0.0	0.0	20.5	13.7	0.0	0.0	0.0	0.0	6.3
Total Delay	35.8	35.6	20.7	68.7	57.8	35.5	23.7	9.5	32.8	36.3
Queue Length 50th (ft)	13	11	0	~329	~309	21	66	0	69	227
Queue Length 95th (ft)	39	34	13	#571	#553	54	115	#63	126	#432
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	332	349	303	623	624	316	1108	1583	444	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	52	69	69	0	0	0	0	157
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.03	1.03	0.99	0.14	0.30	0.89	0.33	0.91

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd
2010 Plus Alt#4 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	917	1150	1329	263
v/c Ratio	0.68	0.17	0.72	0.82	0.92	0.34
Control Delay	51.4	15.9	25.1	21.6	35.1	6.0
Queue Delay	0.0	0.0	29.0	0.0	88.1	0.0
Total Delay	51.4	15.9	54.2	21.6	123.2	6.0
Queue Length 50th (ft)	85	61	308	631	437	25
Queue Length 95th (ft)	141	93	m320	m707	508	73
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1789	1270	1399	1592	842
Starvation Cap Reductn	0	0	393	0	353	0
Spillback Cap Reductn	0	0	0	0	478	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.17	1.05	0.82	1.19	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1513	1648	455	420	768	746
v/c Ratio	0.73	1.26	0.98	0.56	0.57	0.97	1.91
Control Delay	67.5	146.9	47.8	4.8	27.1	45.5	441.3
Queue Delay	0.0	117.7	52.1	0.2	0.7	3.7	15.7
Total Delay	67.5	264.6	99.9	5.0	27.8	49.2	457.0
Queue Length 50th (ft)	73	~481	430	18	229	412	~916
Queue Length 95th (ft)	m98	#609	#614	m41	336	#726	#1316
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1674	817	734	792	390
Starvation Cap Reductn	0	206	98	55	0	0	0
Spillback Cap Reductn	0	79	214	0	100	16	7
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.53	1.13	0.60	0.66	0.99	1.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	820	1451	734	380	726	332	153	161	110	618	1124
v/c Ratio	1.38	1.31	1.21	1.39	0.68	0.61	0.84	0.86	0.42	1.25	0.86
Control Delay	214.6	170.8	117.3	231.4	37.8	24.9	91.5	93.8	26.5	154.2	21.3
Queue Delay	0.0	15.8	2.6	0.0	0.8	0.2	0.0	0.0	0.0	118.4	45.4
Total Delay	214.6	186.6	120.0	231.4	38.6	25.0	91.5	93.8	26.5	272.6	66.6
Queue Length 50th (ft)	~395	~668	~597	~358	237	121	121	127	25	~539	170
Queue Length 95th (ft)	m#260	m#376	m192	#545	304	219	m#235	m#249	m69	m#656	m311
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	548	183	188	261	495	1300
Starvation Cap Reductn	0	29	3	0	0	0	0	0	0	87	273
Spillback Cap Reductn	0	0	0	0	115	17	0	0	0	0	183
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	1.35	1.22	1.39	0.77	0.63	0.84	0.86	0.42	1.51	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St

2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1713	396
v/c Ratio	0.21	0.22	0.88	0.92	0.46
Control Delay	23.4	23.0	31.9	20.6	12.6
Queue Delay	1.2	0.7	5.6	1.3	0.0
Total Delay	24.6	23.7	37.5	21.9	12.6
Queue Length 50th (ft)	78	82	336	615	227
Queue Length 95th (ft)	127	114	#540	#757	333
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	161	336	0	50	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.94	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street

2010 Plus Alt#4 SAT

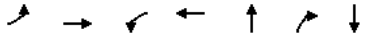
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	1050	41	855	309	262	39	250	103
v/c Ratio	0.82	0.92	0.38	0.95	0.78	0.63	0.11	0.66	0.26
Control Delay	84.9	38.0	41.4	46.9	34.5	27.7	21.3	28.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.9	38.0	41.4	46.9	34.5	27.7	21.3	28.7	6.7
Queue Length 50th (ft)	38	~242	16	180	114	90	13	92	0
Queue Length 95th (ft)	#120	#374	#46	#315	#230	166	35	160	34
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	113	1138	107	900	437	457	428	450	452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.92	0.38	0.95	0.71	0.57	0.09	0.56	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

2010 Plus Alt#4 SAT



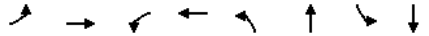
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1307	190	1246	226	237	60
v/c Ratio	0.32	0.81	1.19	0.62	0.75	0.52	0.24
Control Delay	62.4	23.0	137.2	15.7	43.0	6.8	27.9
Queue Delay	0.0	55.4	0.0	5.9	0.0	0.1	0.0
Total Delay	62.4	78.4	137.2	21.5	43.0	7.0	27.9
Queue Length 50th (ft)	13	92	~143	65	140	0	28
Queue Length 95th (ft)	m24	#734	m#151	m#468	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1621	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	695	0	0	0
Spillback Cap Reductn	0	451	0	0	0	31	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.12	1.19	0.95	0.51	0.45	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

2010 Plus Alt#4 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1174	78	698	622	1015	160	1217
v/c Ratio	0.81	1.06	0.76	0.84	1.13	0.82	0.78	1.16
Control Delay	62.6	55.2	84.2	45.7	119.9	36.3	57.0	114.3
Queue Delay	0.0	22.7	0.0	6.0	76.6	0.0	0.0	0.5
Total Delay	62.6	77.9	84.2	51.8	196.5	36.3	57.0	114.8
Queue Length 50th (ft)	89	~428	50	221	~238	312	99	~481
Queue Length 95th (ft)	m162	#526	#128	#323	#348	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1112	106	833	549	1243	239	1051
Starvation Cap Reductn	0	56	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	74	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.11	0.74	0.95	1.31	0.82	0.67	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #4
2030

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1327	124	881	131	354	72	298	214
v/c Ratio	1.08	0.85	0.70	1.07	0.57	0.76	0.24	0.93	0.48
Control Delay	97.5	32.0	46.0	82.3	51.9	50.0	41.6	80.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	32.0	46.0	82.3	51.9	50.0	41.6	80.2	9.3
Queue Length 50th (ft)	~479	421	81	~381	87	118	44	210	0
Queue Length 95th (ft)	#697	#542	m84	m#406	150	169	88	#373	65
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1570	193	825	257	520	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.85	0.64	1.07	0.51	0.68	0.24	0.93	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	914	229	943	125	1130
v/c Ratio	0.83	0.62	1.00	0.91	0.87	0.49	1.04
Control Delay	41.1	10.2	60.5	81.2	45.4	50.4	74.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	10.2	60.5	81.2	45.4	50.4	74.3
Queue Length 50th (ft)	19	66	324	161	326	82	~452
Queue Length 95th (ft)	m#39	97	#477	#302	#436	143	#587
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	155	1521	914	257	1085	257	1090
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.62	1.00	0.89	0.87	0.49	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	69	161	283	164	91	126	682
v/c Ratio	0.44	0.42	0.25	0.38	0.49	0.19	0.63	0.90
Control Delay	49.9	47.9	3.2	1.0	39.4	8.5	48.9	34.2
Queue Delay	0.0	0.0	0.6	1.0	0.0	0.0	0.0	0.0
Total Delay	49.9	47.9	3.8	2.0	39.4	8.5	48.9	34.2
Queue Length 50th (ft)	48	45	2	0	94	0	87	413
Queue Length 95th (ft)	97	94	m15	0	186	43	152	#710
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	364	381	765	826	370	525	364	913
Starvation Cap Reductn	0	0	353	316	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.18	0.39	0.55	0.44	0.17	0.35	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	282	53	266	193
v/c Ratio	0.20	0.77	0.77	0.76
Control Delay	1.1	88.3	53.3	49.3
Queue Delay	0.7	0.0	0.0	0.0
Total Delay	1.8	88.3	53.3	49.3
Queue Length 50th (ft)	12	36	182	131
Queue Length 95th (ft)	12	#120	#342	217
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1470	77	383	365
Starvation Cap Reductn	875	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.69	0.69	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	161	38	371	24	694
v/c Ratio	0.87	0.53	0.19	0.33	0.14	0.68
Control Delay	43.8	25.0	18.7	8.1	20.9	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	25.0	18.7	8.1	20.9	15.9
Queue Length 50th (ft)	70	42	11	35	7	88
Queue Length 95th (ft)	#194	#90	27	157	23	#364
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	363	303	283	1109	283	1015
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.53	0.13	0.33	0.08	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	289	269	63	276	349	418
v/c Ratio	0.65	0.59	1.07	0.99	0.10	0.12	0.30	0.19
Control Delay	72.9	20.3	126.8	105.3	0.8	0.6	1.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	72.9	20.3	126.8	105.3	0.8	0.6	2.1	6.8
Queue Length 50th (ft)	45	0	~222	186	1	2	12	48
Queue Length 95th (ft)	#112	56	#391	#352	m1	m2	67	68
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	618	2339	1164	2186
Starvation Cap Reductn	0	0	0	0	0	0	439	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	1.07	0.99	0.10	0.12	0.48	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

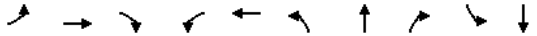
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	309	40	300	260	155	309
v/c Ratio	0.88	0.07	0.76	0.19	0.15	0.55
Control Delay	61.7	20.8	35.6	1.8	11.6	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	20.8	35.6	1.8	11.6	7.7
Queue Length 50th (ft)	213	9	84	4	45	0
Queue Length 95th (ft)	#345	m41	129	6	84	70
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	953	1236	1344	1054	577
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.04	0.24	0.19	0.15	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

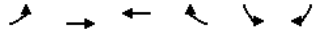
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	429	452	93	113	1044	80	361
v/c Ratio	0.04	0.16	0.13	0.64	0.66	0.47	0.11	0.66	0.44	0.75
Control Delay	35.8	36.0	18.1	28.2	29.0	34.2	19.4	2.2	34.1	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	18.1	28.2	29.0	34.2	19.4	2.2	34.1	26.5
Queue Length 50th (ft)	2	10	0	174	187	40	20	0	35	143
Queue Length 95th (ft)	14	35	20	#410	#438	93	41	0	83	256
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	348	366	325	673	681	348	1228	1583	441	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.05	0.64	0.66	0.27	0.09	0.66	0.18	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	822	1198	936	151
v/c Ratio	0.38	0.23	0.66	0.83	0.86	0.25
Control Delay	39.1	5.6	19.2	16.8	34.2	4.2
Queue Delay	0.0	0.0	1.6	0.0	0.1	0.0
Total Delay	39.1	5.6	20.8	16.8	34.3	4.2
Queue Length 50th (ft)	71	33	104	668	286	0
Queue Length 95th (ft)	126	68	m223	m726	319	38
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2068	1254	1441	1373	724
Starvation Cap Reductn	0	0	255	0	0	0
Spillback Cap Reductn	0	1	0	0	27	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.23	0.82	0.83	0.70	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1097	1341	431	649	753	739
v/c Ratio	0.27	0.46	0.90	0.54	1.02	1.21	1.05
Control Delay	29.0	8.9	25.3	2.8	71.8	135.3	75.1
Queue Delay	0.0	2.1	0.0	0.2	0.0	45.7	67.1
Total Delay	29.0	11.0	25.3	3.0	71.8	181.0	142.2
Queue Length 50th (ft)	22	160	195	15	~444	~597	~526
Queue Length 95th (ft)	m48	146	m#337	m13	#689	#850	#765
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	800	639	622	703
Starvation Cap Reductn	0	1100	0	45	0	0	0
Spillback Cap Reductn	0	270	0	0	0	49	94
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.90	0.57	1.02	1.31	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	494	1601	334	75	843	171	22	23	42	247	804
v/c Ratio	0.72	1.14	0.37	0.59	0.88	0.37	0.19	0.19	0.28	0.46	0.53
Control Delay	45.0	90.7	1.6	58.4	47.2	24.9	43.9	44.0	15.4	40.4	8.1
Queue Delay	0.0	12.0	0.2	0.0	3.5	0.0	0.0	0.0	0.0	1.8	0.0
Total Delay	45.0	102.7	1.8	58.4	50.6	24.9	43.9	44.0	15.4	42.1	8.1
Queue Length 50th (ft)	155	~658	9	47	271	65	14	14	0	131	93
Queue Length 95th (ft)	m180	m#714	m14	#95	#378	126	38	40	32	m153	m106
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	687	1404	897	142	956	458	185	186	212	537	1508
Starvation Cap Reductn	0	33	128	0	0	0	0	0	0	159	24
Spillback Cap Reductn	0	0	0	0	59	0	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.17	0.43	0.53	0.94	0.37	0.12	0.12	0.20	0.65	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	578	197
v/c Ratio	0.07	0.07	0.20	0.25	0.19
Control Delay	27.0	26.6	3.1	7.8	12.6
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.0	26.6	3.8	7.8	12.6
Queue Length 50th (ft)	15	14	0	74	59
Queue Length 95th (ft)	38	31	25	99	110
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2279	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.25	0.19

Intersection Summary

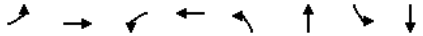
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	859	38	651	355	313	32	306	115
v/c Ratio	1.20	0.62	0.29	0.80	0.91	0.77	0.09	0.86	0.29
Control Delay	153.4	24.6	46.7	44.6	61.0	47.6	24.6	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.4	24.6	46.7	44.6	61.0	47.6	24.6	45.3	10.2
Queue Length 50th (ft)	~368	219	23	203	232	196	12	159	9
Queue Length 95th (ft)	#556	294	55	#272	#393	#310	m26	#305	44
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	354	1391	159	810	408	427	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.62	0.24	0.80	0.87	0.73	0.09	0.78	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

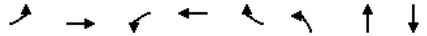
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	475	111	583	132	808	52	1042
v/c Ratio	0.87	0.68	0.64	0.75	0.65	0.47	0.41	0.68
Control Delay	99.9	35.2	52.0	37.7	46.2	19.3	45.9	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	35.2	52.0	37.7	46.2	19.3	45.9	27.3
Queue Length 50th (ft)	70	134	69	184	82	172	32	267
Queue Length 95th (ft)	#171	176	124	222	136	274	69	#464
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	889	212	1058	301	1735	230	1525
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.53	0.52	0.55	0.44	0.47	0.23	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	398	87	439	341	123	440	261
v/c Ratio	0.25	0.34	0.58	0.31	0.41	0.27	0.93	0.79
Control Delay	48.4	26.4	58.3	24.6	5.1	30.9	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.4	58.3	24.6	5.5	30.9	56.0	41.8
Queue Length 50th (ft)	16	95	53	93	0	62	265	160
Queue Length 95th (ft)	43	153	#126	180	71	110	#442	222
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1176	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.34	0.56	0.31	0.51	0.26	0.88	0.53

Intersection Summary

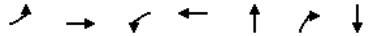
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	445	60	811	258	151	352	42	188	280
v/c Ratio	0.27	0.29	0.44	0.48	0.29	0.71	0.75	0.10	1.32	0.71
Control Delay	46.8	20.1	49.6	21.9	4.1	50.4	36.0	7.3	221.7	33.0
Queue Delay	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	20.1	49.6	23.5	4.5	50.4	36.0	7.3	221.7	33.0
Queue Length 50th (ft)	18	88	37	187	0	93	209	0	~161	125
Queue Length 95th (ft)	46	156	76	302	53	156	270	23	#301	186
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1557	165	1699	894	266	671	597	142	539
Starvation Cap Reductn	0	0	0	668	299	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.29	0.36	0.79	0.43	0.57	0.52	0.07	1.32	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

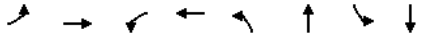


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	630	128	952	444	127	58
v/c Ratio	0.04	0.45	0.68	0.51	0.94	0.27	0.39
Control Delay	47.3	25.2	49.0	11.2	60.4	12.3	39.1
Queue Delay	0.0	0.8	0.0	0.7	0.0	0.0	0.0
Total Delay	47.3	25.9	49.0	11.9	60.4	12.3	39.1
Queue Length 50th (ft)	2	152	57	35	274	19	33
Queue Length 95th (ft)	11	244	m103	m291	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1392	208	1857	489	491	295
Starvation Cap Reductn	0	435	0	521	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.66	0.62	0.71	0.91	0.26	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	579	34	856	391	1020	175	1136
v/c Ratio	0.63	0.54	0.24	0.88	0.81	0.79	0.78	0.92
Control Delay	69.2	34.9	49.0	46.9	56.4	34.9	49.7	44.3
Queue Delay	0.0	0.1	0.0	0.1	5.5	0.0	0.0	0.1
Total Delay	69.2	35.0	49.0	47.1	61.8	34.9	49.7	44.4
Queue Length 50th (ft)	70	54	20	214	126	303	109	360
Queue Length 95th (ft)	126	241	m51	#435	#196	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1169	157	972	481	1286	301	1233
Starvation Cap Reductn	0	64	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	4	51	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.52	0.22	0.88	0.91	0.79	0.58	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	514	117	845	240	409
v/c Ratio	0.31	0.29	0.59	0.41	0.40	0.75
Control Delay	18.7	9.1	32.8	7.8	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	9.1	32.8	7.8	16.0	26.3
Queue Length 50th (ft)	26	61	33	43	25	52
Queue Length 95th (ft)	m39	m114	#86	130	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.29	0.55	0.41	0.39	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	493	63	183	5	312
v/c Ratio	0.68	0.06	0.44	0.01	0.55
Control Delay	12.2	4.4	10.2	10.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	4.4	10.2	10.8	5.4
Queue Length 50th (ft)	42	4	18	1	10
Queue Length 95th (ft)	#163	19	65	6	59
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	734	1198	647	728	847
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.05	0.28	0.01	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	565	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1378	1305
v/c Ratio	0.83	0.77	0.67	0.64
Control Delay	60.2	47.9	17.4	16.6
Queue Delay	0.0	0.0	0.7	0.0
Total Delay	60.2	47.9	18.0	16.6
Queue Length 50th (ft)	101	147	324	296
Queue Length 95th (ft)	#170	202	409	374
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	317	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.79	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	693	1255
v/c Ratio	0.58	1.19	0.39	0.45
Control Delay	27.5	121.6	13.7	14.1
Queue Delay	0.1	0.0	3.7	0.0
Total Delay	27.6	121.6	17.3	14.1
Queue Length 50th (ft)	201	~570	125	165
Queue Length 95th (ft)	262	#807	166	200
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1304	722	1791	2792
Starvation Cap Reductn	0	0	985	0
Spillback Cap Reductn	38	0	0	205
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.19	0.86	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	731	560	717
v/c Ratio	0.71	0.48	0.88	0.30
Control Delay	25.2	15.9	45.2	5.4
Queue Delay	0.0	0.1	0.0	0.7
Total Delay	25.2	16.0	45.2	6.1
Queue Length 50th (ft)	108	111	122	54
Queue Length 95th (ft)	146	176	#206	96
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	638	2392
Starvation Cap Reductn	0	0	0	1246
Spillback Cap Reductn	47	78	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.51	0.88	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1060	156	1031	222	694	159	407	533
v/c Ratio	0.92	0.85	0.76	1.05	0.69	1.08	0.45	1.09	0.88
Control Delay	71.3	40.1	57.2	61.7	51.8	95.3	43.4	115.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	40.1	57.2	61.7	51.8	95.3	43.4	115.4	30.6
Queue Length 50th (ft)	219	357	108	~429	156	~280	99	~325	123
Queue Length 95th (ft)	#380	#476	m94	m320	m195	m#358	166	#517	#327
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	645	354	373	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.69	1.08	0.45	1.09	0.88

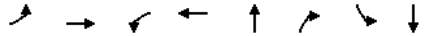
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	1002	294	1512	201	1413
v/c Ratio	1.68	0.67	1.12	1.07	1.35	0.83	1.34
Control Delay	351.7	26.4	99.0	120.0	197.4	74.7	193.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	351.7	26.4	99.0	120.0	197.4	74.7	193.8
Queue Length 50th (ft)	~224	343	~426	~232	~741	140	~687
Queue Length 95th (ft)	m#287	m398	#558	#402	#882	#266	#827
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	127	1518	894	274	1116	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.68	0.67	1.12	1.07	1.35	0.83	1.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	89	216	639	482	333	98	625
v/c Ratio	0.73	0.37	0.32	0.85	1.24	0.52	0.60	0.88
Control Delay	58.3	49.1	7.3	10.6	165.8	9.8	70.2	49.0
Queue Delay	0.0	0.0	10.3	147.3	0.0	0.0	1.9	0.0
Total Delay	58.3	49.1	17.7	157.9	165.8	9.8	72.0	49.0
Queue Length 50th (ft)	126	63	18	39	~469	23	75	443
Queue Length 95th (ft)	202	115	m14	m0	#707	110	#150	#697
Internal Link Dist (ft)		441		114	774			287
Turn Bay Length (ft)	50		35				45	
Base Capacity (vph)	294	308	676	756	389	636	162	713
Starvation Cap Reductn	0	0	423	274	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	2	14	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.29	0.85	1.33	1.24	0.53	0.66	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	515	39	447	453
v/c Ratio	0.37	0.63	1.38	1.46
Control Delay	3.1	91.0	226.2	260.5
Queue Delay	0.6	0.0	17.4	47.5
Total Delay	3.7	91.0	243.6	308.0
Queue Length 50th (ft)	56	29	~465	~487
Queue Length 95th (ft)	49	#93	#697	#724
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1399	62	325	310
Starvation Cap Reductn	517	0	0	0
Spillback Cap Reductn	0	0	9	21
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.63	1.41	1.57

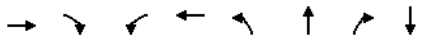
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	577	203	172	795	20	640
v/c Ratio	1.40	0.43	0.78	0.82	0.12	0.95
Control Delay	215.5	18.4	44.8	22.9	22.8	41.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	215.5	18.4	44.8	22.9	22.8	41.0
Queue Length 50th (ft)	~264	50	56	229	8	172
Queue Length 95th (ft)	#433	101	m#128	#523	m14	m#296
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	413	469	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.40	0.43	0.76	0.82	0.09	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	528	500	137	395	342	778
v/c Ratio	0.17	0.58	0.70	0.67	0.86	0.29	0.45	0.62
Control Delay	50.2	23.5	12.2	10.9	65.9	21.3	8.5	29.6
Queue Delay	0.6	1.8	11.5	7.0	0.0	0.5	0.6	0.0
Total Delay	50.9	25.3	23.7	17.9	65.9	21.8	9.1	29.6
Queue Length 50th (ft)	12	12	112	96	61	65	33	227
Queue Length 95th (ft)	35	65	m215	m190	m#90	m73	m46	292
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	203	751	746	159	1358	768	1257
Starvation Cap Reductn	0	0	18	18	0	544	165	0
Spillback Cap Reductn	43	32	200	198	0	0	8	5
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.58	0.96	0.91	0.86	0.49	0.57	0.62

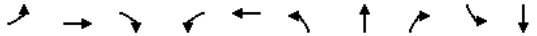
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	327	36	499	720	346	529
v/c Ratio	0.78	0.05	0.67	0.56	0.43	0.96
Control Delay	34.0	1.7	30.0	4.2	25.7	42.9
Queue Delay	1.2	0.0	0.0	0.4	0.0	0.0
Total Delay	35.2	1.7	30.1	4.6	25.7	42.9
Queue Length 50th (ft)	152	0	108	10	173	219
Queue Length 95th (ft)	323	m3	125	17	284	#428
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	976	1155	1286	813	587
Starvation Cap Reductn	36	0	0	176	0	0
Spillback Cap Reductn	0	0	11	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.04	0.44	0.65	0.43	0.90

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

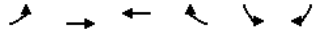


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	315	329	12	773	1756	283	675
v/c Ratio	0.60	1.22	0.22	0.82	0.85	0.14	0.92	1.11	0.86	0.82
Control Delay	47.1	161.3	28.6	44.5	46.1	47.6	49.6	65.1	49.8	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	161.3	28.6	44.5	46.1	47.6	49.6	65.1	49.8	33.5
Queue Length 50th (ft)	108	~319	23	193	204	7	253	~227	170	339
Queue Length 95th (ft)	#193	#506	62	#322	#342	26	#378	#492	#294	#662
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	302	318	288	440	442	238	868	1583	383	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.22	0.22	0.72	0.74	0.05	0.89	1.11	0.74	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1535	1348	1001	361
v/c Ratio	0.46	0.49	1.18dr	0.96	0.92	0.51
Control Delay	45.6	5.9	64.9	25.1	47.3	9.0
Queue Delay	0.0	0.0	225.4	0.0	3.1	0.0
Total Delay	45.6	5.9	290.3	25.1	50.3	9.0
Queue Length 50th (ft)	95	87	~589	803	344	34
Queue Length 95th (ft)	160	134	m410	m612	#460	114
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2197	1401	1399	1124	715
Starvation Cap Reductn	0	0	443	0	0	0
Spillback Cap Reductn	0	11	0	0	63	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.50	1.60	0.96	0.94	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1226	2137	505	603	851	626
v/c Ratio	0.45	0.82	1.27	0.66	1.07	1.42	1.81
Control Delay	64.2	14.6	151.9	6.8	93.2	226.5	400.4
Queue Delay	0.0	20.0	237.6	0.5	33.6	43.3	95.1
Total Delay	64.2	34.7	389.5	7.3	126.8	269.7	495.5
Queue Length 50th (ft)	111	84	~753	38	~496	~825	~1132
Queue Length 95th (ft)	m141	m101	m#703	m30	#726	#1092	#1106
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	598	345
Starvation Cap Reductn	0	180	107	60	0	0	0
Spillback Cap Reductn	0	295	497	0	41	38	36
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.03	1.80	0.71	1.15	1.52	2.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	541	1191	745	325	1274	300	72	76	66	491	1128
v/c Ratio	1.02	1.17	1.05	1.19	1.20	0.59	0.34	0.35	0.25	1.00	0.93
Control Delay	70.9	114.2	48.8	151.0	134.0	35.9	49.6	49.9	25.2	73.6	22.4
Queue Delay	0.0	26.1	9.1	0.0	349.1	0.0	0.0	0.0	0.0	99.8	51.3
Total Delay	70.9	140.3	57.9	151.0	483.1	35.9	49.6	49.9	25.2	173.4	73.8
Queue Length 50th (ft)	~212	~545	~276	~272	~565	178	57	61	19	340	171
Queue Length 95th (ft)	m189	m#435	m397	#470	#733	286	110	113	65	#565	#382
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	507	214	217	259	492	1215
Starvation Cap Reductn	0	49	16	0	0	0	0	0	0	101	43
Spillback Cap Reductn	0	0	0	0	418	0	0	0	0	0	203
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.23	1.08	1.19	1.98	0.59	0.34	0.35	0.25	1.26	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1234	376
v/c Ratio	0.17	0.17	0.45	0.60	0.62
Control Delay	32.2	30.9	10.0	15.9	42.1
Queue Delay	2.3	1.3	0.6	0.0	0.0
Total Delay	34.5	32.2	10.6	15.9	42.1
Queue Length 50th (ft)	61	64	101	273	278
Queue Length 95th (ft)	118	104	157	337	381
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1823	2069	610
Starvation Cap Reductn	351	750	572	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.66	0.60	0.62

Intersection Summary

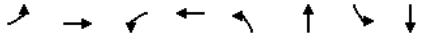
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1272	24	870	601	661	73	314	158
v/c Ratio	1.35	1.30	0.26	1.19	0.96	1.01	0.20	0.83	0.36
Control Delay	230.8	174.9	56.4	136.8	65.5	75.6	43.4	53.4	14.3
Queue Delay	0.0	0.0	0.0	0.0	21.4	41.7	0.0	0.0	0.0
Total Delay	230.8	174.9	56.4	136.8	86.9	117.2	43.4	53.4	14.3
Queue Length 50th (ft)	~207	~622	17	~390	424	~509	49	216	16
Queue Length 95th (ft)	m#352	m#756	45	#519	#740	#818	m88	301	79
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	978	97	732	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	50	66	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.30	0.25	1.19	1.05	1.13	0.15	0.60	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

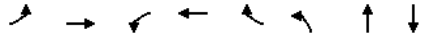


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	1000	112	632	195	1592	118	1460
v/c Ratio	0.97	0.99	0.65	0.71	0.82	1.26	0.67	1.28
Control Delay	99.3	57.6	50.5	32.9	58.0	153.1	52.2	163.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	57.6	50.5	32.9	58.0	153.1	52.2	163.7
Queue Length 50th (ft)	110	~303	61	162	108	~649	65	~601
Queue Length 95th (ft)	#243	#440	#118	222	#213	#786	#131	#737
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1014	197	978	256	1261	197	1137
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.99	0.57	0.65	0.76	1.26	0.60	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	1022	166	801	113	273	540	711
v/c Ratio	0.31	1.26	1.34	0.82	0.23	0.57	1.10	1.45
Control Delay	50.1	159.1	234.7	43.8	7.4	37.1	106.5	241.8
Queue Delay	0.0	66.5	24.5	2.4	0.0	0.0	0.0	1.3
Total Delay	50.1	225.6	259.2	46.2	7.4	37.1	106.5	243.1
Queue Length 50th (ft)	21	~423	~139	265	0	150	~383	~626
Queue Length 95th (ft)	51	#553	#270	#396	43	234	#590	#852
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	812	124	975	500	478	489	492
Starvation Cap Reductn	0	86	0	84	0	0	0	0
Spillback Cap Reductn	0	20	5	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.41	1.39	0.90	0.23	0.57	1.10	1.45

Intersection Summary

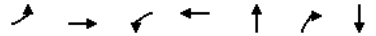
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1126	151	836	277	231	417	140	376	676
v/c Ratio	0.39	1.02	0.74	0.60	0.37	1.09	0.77	0.26	1.77	1.26
Control Delay	46.8	68.0	56.8	27.4	4.5	130.6	43.7	6.0	384.4	156.2
Queue Delay	0.0	97.1	0.0	5.4	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	165.1	56.8	32.7	5.0	130.6	43.7	6.0	384.4	156.2
Queue Length 50th (ft)	30	~419	93	232	0	~167	243	0	~367	~548
Queue Length 95th (ft)	64	#552	#173	314	55	#316	#383	44	m#406	m#561
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1100	230	1400	758	212	540	540	212	535
Starvation Cap Reductn	0	204	0	492	184	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.26	0.66	0.92	0.48	1.09	0.77	0.26	1.77	1.26

Intersection Summary

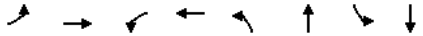
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1527	166	1172	535	302	209
v/c Ratio	0.19	1.38	0.78	0.90	1.18	0.59	0.76
Control Delay	40.1	204.3	50.4	25.0	136.2	19.4	46.7
Queue Delay	0.0	133.3	0.0	11.6	0.0	3.9	4.6
Total Delay	40.1	337.6	50.4	36.7	136.2	23.3	51.3
Queue Length 50th (ft)	19	~674	95	~430	~411	71	126
Queue Length 95th (ft)	48	#935	m51	m#284	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1110	301	1305	454	515	348
Starvation Cap Reductn	0	197	0	136	0	0	0
Spillback Cap Reductn	0	89	0	0	0	137	82
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.67	0.55	1.00	1.18	0.80	0.79

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1402	49	839	579	1431	298	1634
v/c Ratio	0.95	1.37	0.51	1.24	1.30	1.09	1.20	1.23
Control Delay	38.1	195.7	57.1	154.6	186.5	86.3	159.0	138.0
Queue Delay	2.1	21.1	0.0	6.6	0.0	1.8	0.0	21.3
Total Delay	40.2	216.8	57.1	161.2	186.5	88.1	159.0	159.3
Queue Length 50th (ft)	121	~599	32	~346	~244	~547	~232	~682
Queue Length 95th (ft)	m75	m#398	m67	m#446	#351	#685	#396	#823
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1022	106	674	446	1307	249	1333
Starvation Cap Reductn	0	34	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.42	0.46	1.26	1.30	1.10	1.20	1.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1081	47	818	440	485
v/c Ratio	0.25	0.54	0.26	0.42	0.66	0.86
Control Delay	20.6	11.7	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	11.7	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	167	13	44	50	52
Queue Length 95th (ft)	m17	m150	36	131	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1989	248	1955	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.54	0.19	0.42	0.64	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	589	112	349	160	830
v/c Ratio	1.15	0.13	1.09	0.21	1.06
Control Delay	108.9	13.6	110.1	12.2	71.8
Queue Delay	0.0	0.0	0.0	0.0	17.5
Total Delay	108.9	13.6	110.1	12.2	89.3
Queue Length 50th (ft)	~323	33	~209	40	~465
Queue Length 95th (ft)	#529	64	#380	79	#693
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	749	780
Starvation Cap Reductn	0	0	0	0	31
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.15	0.13	1.09	0.21	1.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1812	2048
v/c Ratio	1.11	0.74	0.92	1.04
Control Delay	117.3	47.0	30.1	54.5
Queue Delay	0.0	0.0	18.7	0.0
Total Delay	117.3	47.0	48.8	54.5
Queue Length 50th (ft)	~206	130	557	~793
Queue Length 95th (ft)	#315	180	#772	#949
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1976	1976
Starvation Cap Reductn	0	0	222	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.03	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1230	1974
v/c Ratio	0.62	1.58	0.79	0.64
Control Delay	30.2	295.5	18.1	12.3
Queue Delay	1.1	0.0	65.9	2.7
Total Delay	31.3	295.5	84.1	15.0
Queue Length 50th (ft)	168	~663	253	238
Queue Length 95th (ft)	227	#891	352	284
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	534	1549	3103
Starvation Cap Reductn	0	0	471	0
Spillback Cap Reductn	187	0	0	975
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	1.58	1.14	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

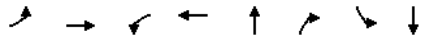
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1225	976	1080
v/c Ratio	1.14	0.98	1.01	0.45
Control Delay	113.0	57.1	71.1	9.2
Queue Delay	85.0	164.6	248.3	13.1
Total Delay	198.0	221.8	319.4	22.4
Queue Length 50th (ft)	~441	444	~360	170
Queue Length 95th (ft)	#573	#601	#500	212
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1293
Spillback Cap Reductn	130	362	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.33	1.38	1.59	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	126	64	233	351	486	317	98	883
v/c Ratio	0.79	0.37	0.43	0.58	0.87	0.39	0.71	0.96
Control Delay	78.2	52.5	16.8	6.3	39.6	3.5	72.4	33.9
Queue Delay	0.0	0.0	12.7	5.2	0.0	0.0	0.0	0.0
Total Delay	78.2	52.5	29.4	11.4	39.6	3.5	72.4	33.9
Queue Length 50th (ft)	100	42	56	0	337	0	77	610
Queue Length 95th (ft)	#210	91	m71	m0	#497	54	#162	#902
Internal Link Dist (ft)		493		63	747			411
Turn Bay Length (ft)								
Base Capacity (vph)	172	184	533	600	674	911	157	1092
Starvation Cap Reductn	0	0	272	184	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.35	0.89	0.84	0.72	0.35	0.62	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1005: 65th Street & Overland Avenue

2030 Plus Alt#4 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	192	47	172	262
v/c Ratio	0.14	0.76	0.85	0.93
Control Delay	1.6	103.6	79.3	87.7
Queue Delay	1.6	0.0	1.5	0.0
Total Delay	3.3	103.6	80.8	87.7
Queue Length 50th (ft)	16	37	137	~213
Queue Length 95th (ft)	17	#113	#273	#400
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1405	66	215	283
Starvation Cap Reductn	1045	0	0	0
Spillback Cap Reductn	0	0	6	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	0.71	0.82	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1009: Shellmound Way & Christie Ave

2030 Plus Alt#4 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	623	581	155	387	521	707
v/c Ratio	0.14	0.38	1.05	0.99	1.27	0.35	0.63	0.69
Control Delay	35.6	27.2	70.0	53.9	176.3	16.7	5.6	36.8
Queue Delay	0.1	5.3	134.6	117.5	0.0	0.7	5.9	0.5
Total Delay	35.6	32.5	204.6	171.4	176.3	17.4	11.5	37.3
Queue Length 50th (ft)	33	58	~500	436	~137	47	37	226
Queue Length 95th (ft)	69	119	#756	#686	m#189	m58	m64	293
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	391	596	589	122	1110	824	1022
Starvation Cap Reductn	0	0	78	78	0	410	243	0
Spillback Cap Reductn	46	183	139	138	0	0	81	81
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.71	1.36	1.29	1.27	0.55	0.90	0.75

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

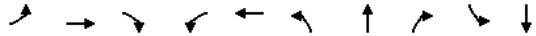
Queues
1010: Shellmound Way & Shellmound St
2030 Plus Alt#4 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	482	73	751	989	433	470
v/c Ratio	0.97	0.08	0.87	0.82	0.65	0.43
Control Delay	53.4	0.8	24.0	31.9	36.8	9.4
Queue Delay	28.7	0.0	0.3	9.2	0.0	0.0
Total Delay	82.1	0.8	24.4	41.0	36.8	9.4
Queue Length 50th (ft)	322	3	245	748	256	119
Queue Length 95th (ft)	#547	m4	m244	m810	#431	222
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1064	1186	1204	666	1089
Starvation Cap Reductn	48	0	0	193	0	0
Spillback Cap Reductn	0	0	104	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.07	0.69	0.98	0.65	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#4 SAT



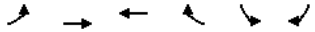
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	477	463	45	366	1436	147	557
v/c Ratio	0.22	0.17	0.07	0.80	0.78	0.32	0.35	0.91	0.63	0.81
Control Delay	35.9	35.6	20.7	36.9	35.1	35.7	23.6	10.6	33.3	32.7
Queue Delay	0.0	0.0	0.0	4.4	3.3	0.0	0.0	0.0	0.0	2.8
Total Delay	35.9	35.6	20.7	41.3	38.3	35.7	23.6	10.6	33.3	35.5
Queue Length 50th (ft)	13	11	0	231	221	21	75	0	69	254
Queue Length 95th (ft)	39	34	13	#452	#436	54	127	#86	126	#486
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	596	306	1136	1583	431	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	22	66	66	0	0	0	0	83
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.90	0.87	0.15	0.32	0.91	0.34	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

2030 Plus Alt#4 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	950	1238	1171	282
v/c Ratio	0.68	0.20	0.71	0.88	0.88	0.37
Control Delay	51.4	13.9	22.7	24.7	34.0	4.8
Queue Delay	0.0	0.0	43.3	0.0	143.6	0.0
Total Delay	51.4	13.9	65.9	24.7	177.6	4.8
Queue Length 50th (ft)	87	64	315	730	391	16
Queue Length 95th (ft)	143	108	m318	m739	419	62
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1894	1343	1399	1592	865
Starvation Cap Reductn	0	0	466	0	311	0
Spillback Cap Reductn	0	2	0	0	702	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.20	1.08	0.88	1.32	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp

2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1372	1724	534	464	818	796
v/c Ratio	0.77	1.15	1.04	0.62	0.63	1.03	2.04
Control Delay	69.2	98.2	63.1	5.0	28.9	61.6	495.4
Queue Delay	0.0	210.6	87.0	0.3	0.5	77.4	206.2
Total Delay	69.2	308.7	150.0	5.3	29.5	139.0	701.5
Queue Length 50th (ft)	78	~424	~534	22	262	~547	~1042
Queue Length 95th (ft)	m124	#530	m#654	m40	382	#810	#1449
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	863	734	793	391
Starvation Cap Reductn	0	271	91	54	0	0	0
Spillback Cap Reductn	0	349	269	0	64	123	94
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.62	1.24	0.66	0.69	1.22	2.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	607	1538	827	380	816	333	153	161	110	626	1187
v/c Ratio	1.02	1.46	1.36	1.39	0.77	0.62	0.84	0.86	0.42	1.26	0.92
Control Delay	70.9	235.1	186.2	231.4	40.8	26.8	91.5	93.8	26.5	159.7	24.2
Queue Delay	0.0	21.7	2.0	0.0	2.4	0.0	0.0	0.0	0.0	123.5	95.0
Total Delay	70.9	256.8	188.2	231.4	43.2	26.8	91.5	93.8	26.5	283.2	119.2
Queue Length 50th (ft)	~234	~792	~783	~358	275	131	121	127	25	~549	203
Queue Length 95th (ft)	m177	m#536	m#457	#545	350	232	m#235	m#249	m69	m#635	m343
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	606	274	1062	538	183	188	261	495	1293
Starvation Cap Reductn	0	34	2	0	0	0	0	0	0	89	265
Spillback Cap Reductn	0	0	0	0	137	0	0	0	0	0	315
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.50	1.37	1.39	0.88	0.62	0.84	0.86	0.42	1.54	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1741	499
v/c Ratio	0.22	0.22	0.83	0.93	0.58
Control Delay	23.6	23.2	28.6	21.7	13.2
Queue Delay	1.2	0.7	2.2	1.5	0.0
Total Delay	24.7	23.8	30.8	23.3	13.2
Queue Length 50th (ft)	79	82	311	633	319
Queue Length 95th (ft)	127	114	370	#781	452
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	150	313	0	44	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.96	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street

2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1182	43	871	361	337	40	308	107
v/c Ratio	1.02	1.08	0.42	1.01	0.88	0.78	0.10	0.76	0.25
Control Delay	130.7	78.8	43.6	60.9	45.5	36.4	21.2	34.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.7	78.8	43.6	60.9	45.5	36.4	21.2	34.0	6.7
Queue Length 50th (ft)	~52	~320	18	~212	145	130	13	118	0
Queue Length 95th (ft)	#142	#442	#51	#324	#285	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	108	1090	103	864	427	448	420	443	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.08	0.42	1.01	0.85	0.75	0.10	0.70	0.24

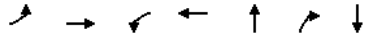
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

2030 Plus Alt#4 SAT



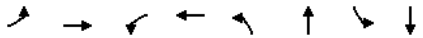
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1604	190	1495	469	238	79
v/c Ratio	0.34	1.20	1.19	0.87	1.06	0.48	0.31
Control Delay	58.3	123.0	129.3	22.4	97.0	16.0	30.5
Queue Delay	0.0	179.1	0.0	115.0	0.0	0.2	0.0
Total Delay	58.3	302.1	129.3	137.4	97.0	16.2	30.5
Queue Length 50th (ft)	11	~614	~144	344	~330	45	42
Queue Length 95th (ft)	m28	#951	m#105	m#497	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	522	0	0	0
Spillback Cap Reductn	0	333	0	0	0	33	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.60	1.19	1.26	1.06	0.52	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1380	78	857	690	1232	170	1504
v/c Ratio	0.90	1.25	0.76	1.05	1.26	1.00	0.80	1.43
Control Delay	61.1	127.9	84.2	81.7	166.3	59.5	59.7	226.9
Queue Delay	0.0	35.2	0.0	57.0	409.3	0.0	0.0	1.2
Total Delay	61.1	163.1	84.2	138.7	575.7	59.5	59.7	228.1
Queue Length 50th (ft)	113	~563	50	~318	~285	~451	105	~687
Queue Length 95th (ft)	m135	m#431	#128	#443	#398	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1107	106	819	549	1232	239	1054
Starvation Cap Reductn	0	66	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	96	231	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.33	0.74	1.19	2.17	1.00	0.71	1.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

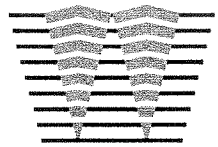
m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX D:
APPROVED PROJECT LISTING

YEARS	PARCEL	TraffixZone	NAME	ADDRESS	STATUS	OCCUPANCY	RES	LVWK	LAB	RET	OFF	EDARTCIV	HOT	IND	NOTE	PKAVPL
2005	1490-1	1	Ex'pression college	6603 Shellmound	building permit issued	under construction						39		-34	approved	
2005	1506-4	4	66th/SP Condos Meyer	66th Vallejo SE	approved	vacant lot	72								6 in Emeryville	
2005	1507-4	7	City Limit	1249 67th	under construction	under construction	92								35 in Emeryville	
2005	1525-3	16	Marina office bldg	Powell	approved	vacant lot					4					
2005	1329-3	22	Elevation 22	Powell Hollis NE	under construction	half occupied late 2004	71							-8		
2005	1038-9	27	Bay St Residential	Shellmound Bay	under construction	under construction	384									
2005	1172-3	37	46th St Lofts Flecto	1012 45th	approved in redesign	vacant building	79			6						
2005	617-18	40	Bash Miller	4090 Holden	nearly complete	looking for tentant					7			-7		
2005	1022-1	44	Green City Lofts	1007 41st	under construction	under construction	62							-9	31 in Emeryville	
2005	1025-27-2	45	Andante-SNK	San Pablo 40th	under construction	half occupied early 2005	125			15						
2005	954-12	45	Key Route Lofts	3960 Adeline	under construction	under construction	15	7		3						
2005	481-17	46	Ambassador Housing	1168 46th	approved	vacant building	55									
2005	Addl LU	56	2501 Chestnut					50								
2005	Addl LU	60	700 University				212			20						
2005	Addl LU	60	Jubilee Village				64			1.72						
2005	Addl LU	61	Wood Street												Trips Generated based on TIA	
2005	Addl LU	62	3132 MLK				42									
2005	1035-4	64	Blue Star Corner	4226 Halleck	approved	vacant lot	20									
06-10	1490-2	1	Nady	6707 Shellmound	discussed	occupied building	102							-66		
06-10	1504-8	4	Haralambides	65th S	discussed	vacant lot	18									
06-10	1504-2	4	Baker Building	1265 65th	discussed	vacant building	6									
06-10	1504-9	4	Key C Press Parking	1259 65th	discussed	parking	18									
06-10	1504-3-1	4	Peterson Glashous	1289 65th	study session held	occupied building	65							-22		
06-10	1504-4-1	4	Peterson Sybase	1313 65th	study sessin held	vacant building	80			5						
06-10	Addl LU	4	Ocen Lofts				4									
06-10	Addl LU	4	Glashaus				150									
06-10	1508-10-2	7	Calvest	1289 67th	discussed	occupied building	72				-42					
06-10	1508-6	7	Farb-Garrett	1315 67th	discussed	35 ksf mostly vacant	125							-5		
06-10	1469-13	8	Baker Flag	Ocean	discussed	vacant lot	15									
06-10	1492-4	9	Pinnacle	6335 Christie	aproved demo permit	demolition completed early 05	224							-54		
06-10	1493-3	10	Christie Park Towers	6150 Christie	building permit ap filed	foundation started									formerly 45 res, 15 lvwk	
06-10	1493-10	10	Marketplace Infill	Shellmound	study sessin held	parking									formerly 171 res, 52 ret	
06-10		10	Marketplace Redevelopment				180			20						
06-10	1480-1	14	Dutro Park Site	61-Hollis-62-Doyle	purchased	occupied building								-29		
06-10	1489-15	17	Intermodal Transit Ctr	Horton 59th NW	developer selected	parking									formerly 150 res	
06-10	1489-13-3	17	Heritage Square Parking	6121 Hollis	discussed	parking									formerly 48 res, 4 ret, 4 office	
06-10		17	Marketplace Redevelopment				160			55						
06-10	1494-4-8	18	Wells Fargo site	5801 Christie	discussed	occupied building									formerly 95 res, 6 ret, -87 office	
06-10	1494-3-2	18	Allegro & Julie's	5800 Shellmound	discussed	occupied buildng									keep (e) 5 ret + 25 edartciv; formerly 74 res, 68 office	
06-10	1494-4-10	18	76 Station	5801 Christie	discussed	occupied building									keep 2 ksf retail; formerly 14 res, 5 ret	
06-10	1494-4-7	18	Denny's	1776 Powell	discussed	occupied building									keep 3 ksf restaur; formerly 20 res, 5 ret	
06-10			Christie/Powell New Development Trips												TIA values	
06-10	1327-1-9	19	Banker-Marks Hollis	5885 Hollis	discussed	occupied buildings			200	8				-33		
06-10	1321-1-2	23	Bay St Site B	1535 Powell	study session scheduled	occupied buildngs									formerly 100 res, 100 ret, 150 hot, -22 ind	
06-10			Site B Project												TIA values	
06-10	1315-1	26	Papermill East	1255 Powell	for sale	vacant building	27									
06-10	1317-1-1	26	Papermill West		for sale	occupied buildings	106			5	-112					
06-10	1038-9	27	Bay St Hotel	Shellmound Bay	study session scheduled	on top of building							0		formerly 200 hot	
06-10	1041-70	28	Chiron Bldg 3 and 7b	4560 Horton	pre-application	parking			350							
06-10	1313-12	29	Doyle St Condos	5509 Beaudry	study sessin held	vacant building	19	8								
06-10	1516-6-5	30	Volvo	Shellmound	building permit ap filed	vacant				19			200		200 hot added	
06-10	1032-5	33	Paula LeDuc Catering	1350 Park	pre-application	occupied building				6	13				expanding up and in seback	
06-10	1029-	35	Pixar 2	Park HollisNE	building permit ap filed	vacant lot			825						Deleted 165 of LAB - Pixar = Manual	
06-10	617-15-1	39	1401 Park Condos	1401 Park	aproved in redesign	vacant lot	43	10		2						
06-10	618-4	40	Cultural Arts Center	4062 Hollis	discussed	occupied but underutilized				3	3	31		-31		reuse bldg
06-10	1025-1	43	Oak Walk	4098 San Pablo	study sessions held		63			4				-9	63(n) - 17(e) DU 6 - 2 retail	
06-10	481-2	46	Check Cashing	3801 San Pablo	developer selected	occupied building	30			-1					formerly 85 res	
06-10	951-4-2	47	Golden Gate Key	San Pablo	discussed	vacant building	45								and keep 18 ksf retail	
06-10		55					168			45					added 3/06	
06-10		57					800			0					added 3/06	
06-10	Addl LU	59	West Berkley Bowl												Trips Generated based on TIA	
06-10	Addl LU	60	2039 4th St							9	10					
06-10	Addl LU	60	2700 San Pablo				30	4								
06-10	Addl LU	60	2612 San Pablo				64			7.5						
06-10	Addl LU	60	2575 San Pablo				27									
06-10	Addl LU	65	1001 Ashby				55			6.59						
06-10	Addl LU	NA	Hollis Green												No Trip Generation for Parks	
10-20	1483-1-5	12	Sheet Music Ralston	1300 64th	discussed	occupied building	26							-25		
10-20	1488-1	13	Hollis St Complex	6261 Hollis	discussed	occupied space in building					70			-70		
10-20	1328-3-2	21	Alders	5812 Hollis	discussed	occupied site and building	40				7			-7		
10-20	1041-70	28	Chiron Bldg 1 office	1403 Stanford	prelim dev plan approved	parking					220					
10-20	1179-1	34	Ctr Cmty Life AC Trans	47th San P 53rd	planning ongoing	occupied building and site					22	140		-53		
10-20	1027-	35	Pixar 3	Park N	prelim dev plan approved	vacant lot									Deleted 162 of LAB - Pixar = manual	
10-20	1079-14-1	38	Old Post Office site	4300 San Pablo	discussed	trailers on pavement	30					-2				
10-20	617-22-2	40	Hollis Realty Group	4065 Hollis	discussed	occupied building	110			4				-57		reuse site
10-20	617-23	40	Industrial Safety	4041 Hollis	Park Av District Plan	occupied building				8	17			-8		reuse site
10-20	618-22	41	Black & White Liquor	4089 San Pablo	discussed	ocupied building	55								keep 5 ksf retail	
10-20	1041-11-4	48	Level 3	5000 Hollis	discussed	occupied but underutilized	155							-150	keep 50 ksf utility	
10-20	1034-1-3	51	Banker-Marks Park Av	1490 Park	discussed	Park Av Plan encouraging	106			7				-100		
10-20	617-16-2	52	East Baybridge west	4050 Horton	discussed	parking									formerly 150 ret	

YEARS	PARCEL	TraffixZone	NAME	ADDRESS	STATUS	OCCUPANCY	RES	LVWK	LAB	RET	OFF	EDARTCIV	HOT	IND	NOTE	PKAVPL
20-30	1476-6	15	Green Storage	Doyle 59th NE	discussed	occupied building	26							-17		
20-30	1495-18	16	Holiday Inn	Powell W	large parking lot	parking							200			
20-30	1318-1-2	25	Sushi Powell Peladeau	5772 Peladeau	discussed	keep 2 ksf retail	5									
20-30	1318-2-2	25	Parking Powell Hollis	1407 Powell	discussed	occupied building	6			2						
20-30	1318-3	25	Lab Hollis Stanford	5701 Hollis	discussed	parking	13									
20-30	1318-7-4	25	Multitenant Pel Stanford	5768 Peladeau	discussed	occupied building	11									
20-30	1318-7-5	25	Parking Peladeau	5764 Peladeau	discussed	parking	11									
20-30	1041-70	28	Chiron future lab	4560 Horton	prelim dev plan approved	parking			350							
20-30	1041-6	31	Sherwin-Williams east	1500 Sherwin	study sessions held	occupied builiding									Sherwin-Williams Base Case; formerly 435 res, 50 ret, 127 off	
20-30	1041-26-2	31	Sherwin-Williams west	1500 Sherwin	study sessions held	occupied building									TIA Values	
20-30	1041-29-2	32	PG&E North	4525 Holis	Park Av District Plan	storage building				5	100			-17	formerly -117 ind	reuse bldg
20-30	1032-7-1	33	Pitzer	1368 Park	Park Av District Plan	occupied building				0	12			-18	formerly 6 ret, 12 off, -18 ind	reuse site
20-30	1032-14	33	PG&E South	4245 Hollis	discussed	storage building	50				22			-15		reuse bldg
20-30	1031-1-2	35	Pixar 4	Hollis 45 SE	prelim dev plan approved	occupied building			525					-1	Deleted 207 of LAB, 2 of RET, -36 of IND - Pixar = manual	
20-30	617-20	40	Perfection Body Shop	4081 Hollis	Park Av District Plan	occupied building				8	8			-8		reuse site
20-30	1026-26-2	42	OaksParkgNE/BofA	4130 San Pablo	large parking lot	parking	40				12					
20-30	1041-13	48	Hollis 45th Industrial	1280 45th	Park Av District Plan	occupied building					29			-29		reuse bldg
20-30	1036-3	49	Pelco	1550 Park	Park Av District Plan	occupied building				2	13			-17		reuse bldg
20-30	617-1	49	Gerow industrial rentals	1555 Park	discussed	about 2/3 occupied				6				-6		reuse site
20-30	617-5-6	50	Trader Vic	1545 Park	Park Av District Plan	ccupied building				11	11			-22		reuse bldg
20-30	617-5-7	50	Buttner	1501 Park	Park Av District Plan	occupied building				5	5			-10		reuse bldg
20-30	617-9	39	Bon Motif warehouse	4045 Horton	Park Av District Plan	occupied building	46			13				-36		reuse site
20-30	617-20-1	53	East Baybridge center	40th Yerba B NW	large parking lot	parking				100						
20-30	618-7-2	54	Easy Auto	4060 Harlan	Park Av District Plan	occupied building					8			-8		reuse site
20-30	Addl LU	58	Garr Building						105							
20-30	Addl LU	63	Anthony						35							
20-30	1036-2	64	Technichem	4245 Halleck	Park Av District Plan	occupied building					15			-15		reuse site
							4719	79	2390	411	454	208	400	-996		

APPENDIX E:
WATRY DESIGN, INC. PARKING STUDY



WATRY DESIGN, INC.

LSA Associates, Inc.

NOV 23 2005

Berkeley

October 5, 2005

Ms. Denise Pinkston
Marketplace Mortgage, LLC
C/o TMG Partners
100 Bush Street, 26th Floor
San Francisco, CA 94104

RE: Marketplace Redevelopment Project - Parking Analysis
WDI Job #05043.312

Dear Denise:

Thank you for choosing Watry Design, Inc. to prepare the parking analysis for the redevelopment of the Marketplace Project Site for the proposed Marketplace Redevelopment Planned Unit Development/Preliminary Development Plan ("PDP"). You requested that we do the following: describe the existing parking conditions; verify existing demand through parking surveys; analyze the demand under the PDP for existing and new uses, both during and after construction; and propose methods and options to assure adequate parking to meet existing and new demand through all phases of development.

As discussed in more detail below and shown on the attached tables and illustrative drawings, the existing parking on the Marketplace Project Site meets and exceeds existing demand. Adequate parking for existing and new demand can be provided both during and after construction under the proposed PDP with the re-configuration of the existing parking lot, phased construction and the implementation of a temporary valet-assist parking plan.

We understand the proposed PDP also includes the development of a mixed use building on the 64th & Christie Project Site, which will provide all its required parking within the building and will not share parking with the Marketplace Project Site. Therefore, this report addresses only the existing and proposed shared parking within the Marketplace Project Site. As shown on the Illustrative Drawings, this report does take into account the effect of the proposed lot line adjustment between the Marketplace Project Site and 64th & Christie Project Site with respect to the locations where on-grade parking will be provided.

In addition, please note that although the proposed PDP does not include the Woodfin Hotel Site, the existing parking requirement of 1,067 parking spaces set forth in Section 3.2.4 the Owner Participation Agreement ("OPA") applies to the "Project Area" for the OPA, which includes both the Marketplace Project Site and the adjacent Woodfin Hotel. Under the Woodfin's Use Permit 96-3, Conditions of Approval Section III.C, the Woodfin Hotel is required to provide 218 parking spaces, including 16 shared parking spaces on the Marketplace Project Site. Therefore, this report addresses parking on the Woodfin Hotel Site as part of the overall parking analysis.

The PDP proposes to redevelop the Marketplace Project Site and add the "Shellmound Building," a mix use, residential and retail, building with structured parking and two new retail pad buildings, one near the existing Borders and one near City Park. The PDP provides both a set of maximum development standards ("Maximum Plan") as well as a proposed, more detailed "Illustrative Plan" for the new uses. See PDP Application, Table 2. This report analyzes parking under both the Maximum Plan and the Illustrative Plan. The Illustrative Plan is depicted on all the attached illustrative drawings, consistent with the PDP illustrative figures.

Please note the following assumptions are used in this report:

- Existing 202 parking spaces on the Woodfin Hotel Site is conservatively assumed to be *exclusive* hotel parking (not currently the case under the existing Reciprocal Easement Agreement);
- Residential parking in the Shellmound Building would be assigned, but all parking spaces on the Marketplace Project Site would be considered shared parking because the residential users on the site would be able to walk to all other uses within the Marketplace Project Site and reduce the overall demand for parking;
- Demand for the existing uses on the Marketplace Project Site is based on the existing parking requirement of 1,067 spaces pursuant to OPA Section 3.4.2 and Master Use Permit 88-7, and new uses within the Shellmound Building and new retail pads is based on the current requirements of Article 55 of the Emeryville Municipal Code;
- New residential demand is calculated using the Illustrative Plan unit mix, which is intended to be conceptual and may be adjusted in the Final Development Plan;
- For the Shellmound Building, both the Illustrative and Maximum Plan analysis assume the new structured parking garage would yield 540 parking spaces, but the number may be higher or lower depending on final architectural design;
- For new retail/commercial demand, this report conservatively assumes a 10% reduction for interior common areas within a building (i.e., hallways, mechanical spaces, elevator shafts and similar "non-usable" interior spaces) for commercial uses per Section 9-4.55.5 of the Municipal Code, although the Code allows up to a 20% reduction.
- For new retail within the Shellmound Building, although the new retail may be either general retail or local retail, this parking analysis conservatively assumes a 4:1000 (one space per 250 square feet) for regional retail rather than 3:1000 (one space per 333 square feet) for local retail.
- The PDP proposes approximately four bicycle racks of up to 20 bicycles. To be conservative, this report does not include any reduction credit for bicycles (6:1) allowed pursuant to Section 9-4.55.2(e).
- In the event that the final design for the Project, or changes in the above assumptions, results in change in the supply or demand, this parking analysis would be revised accordingly.

This report analyzes the supply and demand for both the Maximum and Illustrative Plans in the following six phases of the redevelopment of the Marketplace Project Site: existing parking conditions, the re-configuration of the existing on-grade parking to maximize the existing parking lots, implementation of a valet-assist parking program for office users, construction of the Shellmound Building, completion and occupancy of the Shellmound Building and construction and operation of the new retail pad buildings.

P0 - Existing Parking Requirement

The existing parking requirement is 1,067 spaces pursuant to OPA Section 3.2.4. The existing uses and parking spaces are depicted on Drawing P0 and described in more detail on Table P0.

In order to verify that the existing parking meets actual existing demand, All Traffic Data, a parking survey company, conducted three vacancy surveys on a Friday, Saturday and Sunday in June 2005, to provide a representative period for the site. The survey indicated a range of up to 800 vacancies to 365 vacancies during the

peak load period. See attached graph, *Marketplace Redevelopment Parking Study*. These vacancies can be attributed to the effects of a "Captive Audience" or "Market Synergy typical for an operating mixed use shared parking project" where a visitor parks in one space to visit multiple uses on the site. Based on our review, the existing shared parking meets, and likely exceeds, existing demand.

P1 - Reconfigured On-Grade Parking Plan

Based on an analysis of the current parking lot and the dimension requirements of Municipal Code Section 9-4.55.7 and Table 9-4.55, it is our opinion that the current on-grade parking configuration does not maximize on-grade parking within the parking lot. As depicted on Drawing P1 and summarized on Table P1, an additional 183 spaces can be provided outside of the proposed Shellmound Building Site. This re-configuration will be completed prior to initiation of construction of the Shellmound Building, and results in surplus of 183 shared parking spaces over the existing parking requirement.

P1A - Valet-Assisted Parking Option (Office Only)

Because the Shellmound Building site currently contains 251 on-grade parking spaces, these spaces will be removed and unavailable during construction. The re-configuration will yield 183 spaces, so in order to avoid a deficit during construction, we recommend the use of a temporary valet-assist program (similar to the program described in the attached Ampco materials) during week days for the office users during the construction period if conditions warrant the need. We believe that the demand presented by the office is only during a Monday through Friday as a peak load to the site, and would not need the valet-assisted program for the weekends as the load for office diminishes substantially. As shown on Drawing P1A, 22 valet reserved spaces are proposed to the east of the UA Theater, 44 adjacent to City Park and 96 under the Powell Street over-crossing, subject to City and Agency approval. The valet-assist program would provide a total of 162 additional spaces and a total surplus of 345 parking spaces over the existing parking requirement.

P2 - Shellmound Building Construction Impact Plan

During construction, the existing 251 on-grade parking spaces would be removed. As depicted on Drawing P2 and Table P2, with the re-configured on-grade parking and valet-assist program, there would be a surplus of 94 spaces during construction. During construction, construction-related vehicles will park within the Shellmound Building site.

P2A - Shellmound Building Occupancy Plan

After construction, the Shellmound Building is assumed to provide 540 parking spaces in the new structured parking garage within the mixed-use building, and the valet-assisted program would end, see Drawing P2A and Table P2A. The total residential and retail demand would be 309 under the Illustrative Plan and 403 under the Maximum Plan, resulting in a surplus of 163 parking spaces and 69 parking spaces, respectively. .

P3 - New Retail Pad Building Occupancy Plan

In order to minimize parking impacts, the new retail pad buildings would not be constructed until after the Shellmound Building garage opens. The construction of the retail pad adjacent to City Park would eliminate 28 existing on-grade parking spaces. The new general retail pad buildings would result in a new demand of 35 spaces under the Illustrative Plan and 38 spaces under the Maximum Plan, resulting in a surplus of 100 parking spaces and 3 parking spaces, respectively. See Drawing P3 and Table P3.

We welcome any additional comments or questions that may have arisen during the review of this letter and its attachments. We thank you again for choosing Watry Design, Inc., and look forward to working with you on future projects.

Sincerely yours,

WATRY DESIGN, INC.

David LoCoco
Principal

DL/ms

LIST OF ATTACHMENTS

(1) Tables [P0, P1, P1A,] and [P2, P2A, P3]
(2) Drawings P0, P1, P1A, P2, P2A and P3
(3) All Traffic Data Survey Results Graph
(4) Ampco, Attendant-Assist Parking Plan [4 pages] and Cost Proposal [3 pages]

Marketplace Redevelopment Parking Analysis

October 5, 2005

Phase	Existing Parking Requirement			Supply	
P0	***Marketplace Parcel***			***Marketplace Parcel***	
	Marketplace Office Tower			Marketplace Office Tower	
	Public Market Brick Bldgs		849	Public Market Brick Bldgs	614
	UA Theater			UA Theater	
	Woodfin Site			***Woodfin Site***	
	Woodfin Hotel		218	Woodfin Hotel	202
	Shellmound Parcel			***Shellmound Parcel***	
	Ongrade Parking		none	Ongrade Parking	251
	O.P.A. Required Stalls		*1,067*	*Total Supply*	*1,067*

Total Supply	*1,067*
New Demand	*1,067*
Surplus or (Deficit)	*0*

Phase	Reconfigured On-grade Parking Plan			Supply	
P1	***Marketplace Parcel***			***Marketplace Parcel***	
	Marketplace Office Tower			Marketplace Office Tower	
	Public Market Brick Bldgs		849	Public Market Brick Bldgs	797
	UA Theater			UA Theater	
	Woodfin Site			***Woodfin Site***	
	Woodfin Hotel		218	Woodfin Hotel	202
	Shellmound Parcel			***Shellmound Parcel***	
	Ongrade Parking		none	Ongrade Parking	251
	O.P.A. Required Stalls		*1,067*	*Total Supply*	*1,250*

Total Supply	*1,250*
New Demand	*1,067*
Surplus or (Deficit)	*183*

Phase	Valet-Assisted Parking Option (Office Only)			Supply	
P1A	***Marketplace Parcel***			***Marketplace Parcel***	
	Marketplace Office Tower			Marketplace Office Tower	
	Public Market Brick Bldgs		849	Public Market Brick Bldgs	797
	UA Theater			UA Theater	
	Valet Parking			Valet Parking	66
	Woodfin Site			***Woodfin Site***	
	Woodfin Hotel		218	Woodfin Hotel	202
	Powell Street Overpass			***Powell Street Overpass***	
	Valet Parking			Valet Parking	96
	Shellmound Parcel			***Shellmound Parcel***	
	Ongrade Parking		none	Ongrade Parking	251
	O.P.A. Required Stalls		*1,067*	*Total Supply*	*1,412*

Total Supply	*1,412*
New Demand	*1,067*
Surplus or (Deficit)	*345*

Phase	Shellmound Building Construction Impact Plan	Illustrative Buildout Demand		Maximum Buildout Demand		Supply	
P2	**Marketplace Parcel**					**Marketplace Parcel**	
	Marketplace Office Tower		849		849	Marketplace Office Tower Public Market Brick Bldgs UA Theater	797
	Public Market Brick Bldgs						
	UA Theater						
	Valet Parking					Valet Parking	66
	Woodfin Site					**Woodfin Site**	
	Woodfin Hotel		218		218	Woodfin Hotel	202
	Powell Street Overpass					**Powell Street Overpass**	
	Valet Parking					Valet Parking	96
	Shellmound Parcel					**Shellmound Parcel**	
	Ongrade Parking		none		none	Ongrade Parking	0
	O.P.A. Required Stalls		*1,067*		*1,067*	*Total Supply*	*1,161*
		Total Supply	*1,161*	*Total Supply*	*1,161*		
		New Demand	*1,067*	*New Demand*	*1,067*		
		Surplus or (Deficit)	*94*	*Surplus or (Deficit)*	*94*		

Phase	Shellmound Building Occupancy Plan	Illustrative Buildout Demand								Maximum Buildout Demand								Supply	
P2A	**Marketplace Parcel**																	**Marketplace Parcel**	
	Marketplace Office Tower								849								849	Marketplace Office Tower Public Market Brick Bldgs UA Theater	797
	Public Market Brick Bldgs																		
	UA Theater																		
	Woodfin Site																	**Woodfin Site**	
	Woodfin Hotel								218								218	Woodfin Hotel	202
	New Building Information	Gross Floor Area	Common Area Allowed Reduction	Net Floor Area	Number of Units	Current Emeryville Parking Regulation	Ratio per 1,000 SQ. FT.	Ratio per Unit	Parking Stalls Needed	Gross Floor Area	Common Area Allowed Reduction	Net Floor Area	Number of Units	Current Emeryville Parking Regulation	Ratio per 1,000 SQ. FT.	Ratio per Unit	Parking Stalls Needed	***New Building Information***	
	Shellmound Parcel																	**Shellmound Parcel**	
	New Shellmound Bldg. (Retail)	28,978	10%	26,080		*General Retail = 1 stall per 250 SQ. FT.*	4.0		104	55,000	10%	49,500		*General Retail = 1 stall per 250 SQ. FT.*	4.0		198	New Shellmound Bldg. (Retail)	540
	New Shellmound Bldg. (Residential)				160	*Studio/1BDM = 1 Stall per Unit. 2+BDMS = 1.5 Stalls per unit. 5+ Units = 1 Guest Stall per every 4 Units*		1.28	205				160	*Studio/1BDM = 1 Stall per Unit. 2+BDMS = 1.5 Stalls per unit. 5+ Units = 1 Guest Stall per every 4 Units*		1.28	206	New Shellmound Bldg. (Residential)	
	O.P.A. + New Demand								*1,376*								*1,470*	*Total Supply*	*1,539*
							Total Supply		*1,539*						*Total Supply*		*1,539*		
							New Demand		*1,376*						*New Demand*		*1,470*		
							Surplus or (Deficit)		*163*						*Surplus or (Deficit)*		*69*		

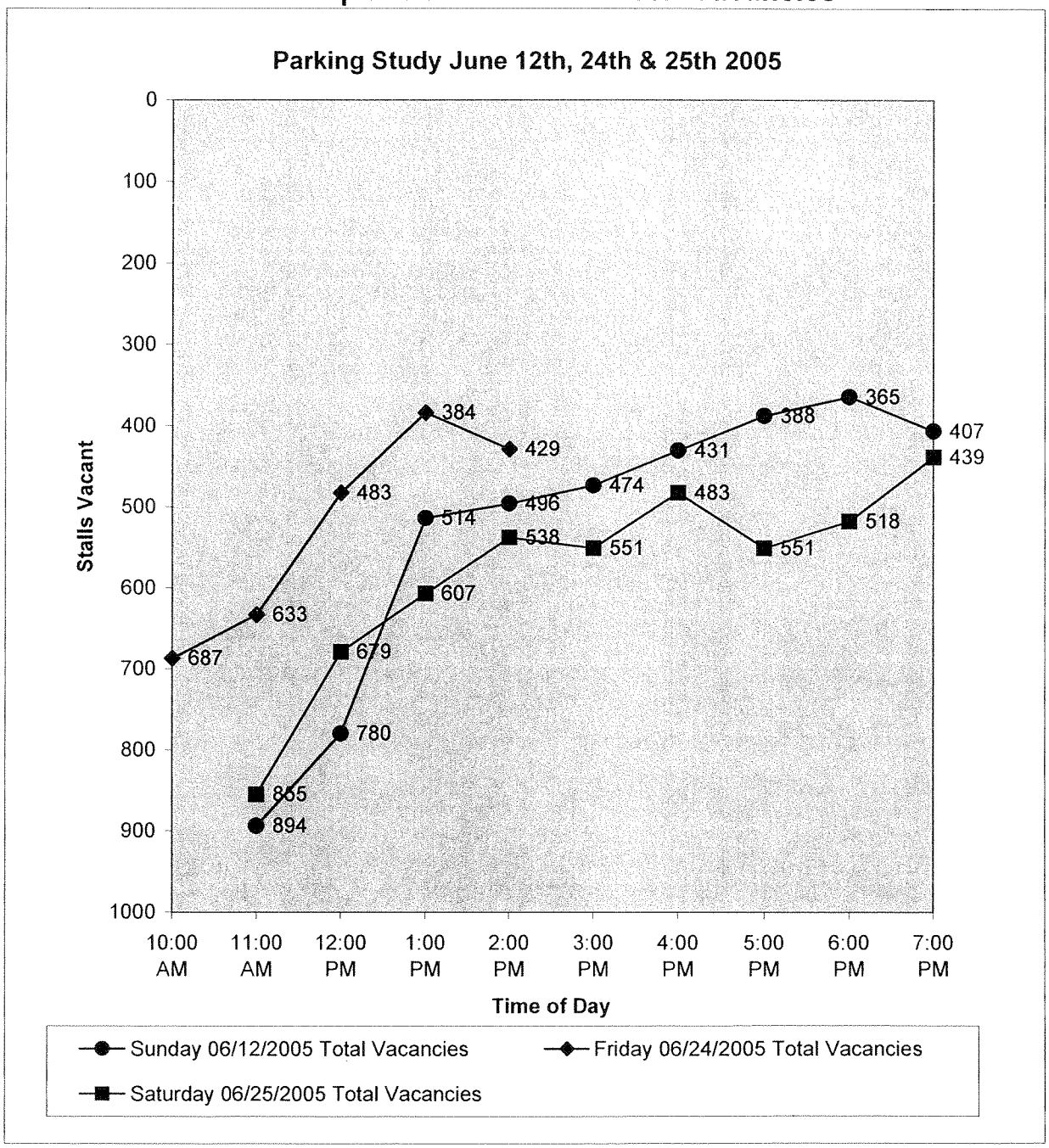
Phase	New Retail Pad Building Occupancy Plan	Illustrative Buildout Demand								Maximum Buildout Demand								Supply	
P3	**Marketplace Parcel**																	**Marketplace Parcel**	
	Marketplace Office Tower								849								849	Marketplace Office Tower Public Market Brick Bldgs UA Theater	769
	Public Market Brick Bldgs																		
	UA Theater																		
	Woodfin Site																	**Woodfin Site**	
	Woodfin Hotel								218								218	Woodfin Hotel	202
	New Building Information	Gross Floor Area	Common Area Allowed Reduction	Net Floor Area	Number of Units	Current Emeryville Parking Regulation	Ratio per 1,000 SQ. FT.	Ratio per Unit	Parking Stalls Needed	Gross Floor Area	Common Area Allowed Reduction	Net Floor Area	Number of Units	Current Emeryville Parking Regulation	Ratio per 1,000 SQ. FT.	Ratio per Unit	Parking Stalls Needed	***New Building Information***	
	Shellmound Parcel																	**Shellmound Parcel**	
	New Shellmound Bldg. (Retail)	28,978	10%	26,080		*General Retail = 1 stall per 250 SQ. FT.*	4.0		104	55,000	10%	49,500		*General Retail = 1 stall per 250 SQ. FT.*	4.0		198	New Shellmound Bldg. (Retail)	540
	New Shellmound Bldg. (Residential)				160	*Studio/1BDM = 1 Stall per Unit. 2+BDMS = 1.5 Stalls per unit. 5+ Units = 1 Guest Stall per every 4 Units*		1.28	205				160	*Studio/1BDM = 1 Stall per Unit. 2+BDMS = 1.5 Stalls per unit. 5+ Units = 1 Guest Stall per every 4 Units*		1.28	206	New Shellmound Bldg. (Residential)	
	New Marketplace Bldgs.																	***New Marketplace Bldgs.***	
	New Retail (By Borders)	5,844	10%	5,260		*General Retail = 1 stall per 333 SQ. FT.*	3.0		16	6,500	10%	5,850		*General Retail = 1 stall per 333 SQ. FT.*	3.0		18	New Retail (By Borders)	
	New Retail (By City Park)	7,178	10%	6,460		*General Retail = 1 stall per 333 SQ. FT.*	3.0		19	7,500	10%	6,750		*General Retail = 1 stall per 333 SQ. FT.*	3.0		20	New Retail (By City Park)	
	O.P.A. + New Demand								*1,411*								*1,508*	*Total Supply*	*1,511*
							Total Supply		*1,511*						*Total Supply*		*1,511*		
							New Demand		*1,411*						*New Demand*		*1,508*		
							Surplus or (Deficit)		*100*						*Surplus or (Deficit)*		*3*		

Marketplace Redevelopment Traffic Study

Data Provided By: All Traffic Data

October 5, 2005

Marketplace and Woodfin Hotel Vacancies



August 1, 2005

Mr. Matt Sites
Parking Planner
Watry Design, Inc.
1700 Seaport Blvd., Suite 210
Redwood City, CA 94063

RE: Attendant-Assist Parking Plan and Cost Proposal

Dear Matt:

I enjoyed meeting with you and Denise Pinkston recently to review TMG's possible need for attendant-assist parking services to accommodate the displaced parking demand which will be generated during the planned construction at their Emeryville site.

The main focus of the program we have been asked to develop is to accommodate additional cars in an 'attendant-assist' mode on the Christie Avenue and Powell St. lots. It is anticipated that the need will arise when construction begins in 2007 and could continue for a year or more over the course of construction.

We have used the attendant-assist concept many times. As we discussed, the program is easiest to provide in staff parking areas, where the inconvenience to patrons is minimized, since most of the cars come in all at once and generally leave at a pre-determined time at the end of the day. This means that there is significantly less of the constant in-and-out traffic that characterizes the typical visitor's parking area. That said, we have provided these services to clients in various visitor parking environments and it has been very successful.

Before we get too far along, it would be useful to further explain the "attendant-assist" operating format: Under the attendant-assist concept, the selected parking area is allowed to fill completely with the cars of patrons who have parked and locked their own vehicles. The parking attendants provided direct additional cars to park in the aisles, blocking the other cars in. The attendants issue claim checks to the parkers in exchange for their keys, and lock the keys in a nearby keybox. The attendants move cars only as necessary to let blocked vehicles exit.

Toward the end of the day, as regular parking spaces become available, the attendants will move aisle cars into these spaces, to make exiting easier for all patrons. Any keys held after posted closing time would be turned over to project security. We can discuss the mechanics of this aspect of our plan at a future time, but generally at other operations it hasn't been much of an issue.

Please note that no cars will remain "stacked" in the aisles at the close of the day. All cars for which we still possess keys will be parked and locked in regular marked stalls in a to-be-designated area of the lot in which the service is provided. Any keys provided to security would be accompanied by a list showing the car's license number, ticket number and the location of the car, to assist patrons who may retrieve their vehicles after our attendants have ended their duties for the day.

Summary of Proposed Operating Plan

- Service would begin @ 8:00 a.m. and end at 6:00p.m., Monday - Friday
- Signage would be posted in all stack parking areas to advise patrons that the service is in underway: "Attendant-Assist Parking Service In Effect – Please Leave Keys With Attendant". (Final language subject to approval.)
- Program can be phased in to coincide with construction, and adjusted as demand warrants. Pricing model is based on a minimum 80 hours per week of service, per lot. Additional areas can be converted to Attendant-Assist parking as needed with one week's advance notice to Ampco to allow us to prepare for staffing, equipment needs, etc.)
- Minimal Physical changes required:

    1) *A rented attendant's booth would be required for each lot where stack parking services are operating.*

    2) *Locking Key Boxes would be provided, as needed at each lot, for secure storage of all patron keys*

    3) *Portable signage and traffic cones will be provided as necessary to direct patrons, identify hours of service and after hours policies and to delineate service area*

Staffing

All employees will be in full uniform at all times when on duty. We will provide valet attendants for (16) hours per day at each lot. We will stagger the shifts for these employees to provide coverage from 8:00 a.m. – 6:00 p.m., for ease of key retrieval. This level of staffing is adequate to provide a high level of service in a visitor parking scenario, essentially providing (2) employees during most operating hours. (By comparison, in a strictly employee-only parking environment, we could provide an acceptable level of service using only (1) attendant during all operating hours.)

Each of the above shifts includes a ½ hour lunch break. We believe this schedule will provide an adequate level of service, while allowing us to provide personnel in a cost-effective manner.

Equipment & Supplies

We will purchase the required signage and other equipment as necessary (any booths needed will be rented at an approximate cost of $250 per month). We anticipate that all necessary start up equipment can be provided for less than $1,500 per lot.

This will include signage, cones, locking keyboxes, etc.. Ampco will pay for the cost of this equipment up front and will pass this cost through on the first month's operating statement.

Insurance

We will provide commercial general liability insurance and garagekeeper's legal liability insurance covering TMG and Ampco in the amount of $5,000,000 (but only to the extent TMG is indemnified pursuant to an executed Parking Management Agreement) and statutory coverage for worker's compensation insurance. This coverage will be subject to a deductible of $2,500.00 per occurrence (there is no deductible on the commercial general liability policy).

Term

We will discuss an appropriate term for the provision of these services once TMG has confirmed the areas to be utilized and the expected duration of the project.

Cost Proposal

We propose to provide our complete services on an actual cost basis, and each month will provide a full disclosure statement which details all costs incurred in the operation of each of the facilities, with separate detail sheets showing labor, labor burden, overhead, and any building and equipment costs. In addition, Ampco shall receive fixed monthly allocations of $150 and $250 per month, per lot, to cover its costs of providing offsite administrative and supervisory support services, respectively, to the locations.

As its fee for providing the complete attendant-assist parking services described herein, Ampco shall receive a monthly fee of $1,000 per location.

I've provided a preliminary cost estimate to provide the service at the Christie Ave. and Powell St. lots, along with a brief summary explanation of the individual costs noted. While this is not a guarantee of the final cost of the program, these estimates should give you a good idea of the current costs to implement the services as described herein.

Matt, all of us at Ampco System Parking look forward to providing our attendant-assist parking services to TMG at its Emeryville project. Please call me when you and the client are ready to take the next step on this exciting undertaking.

Sincerely,

James M. Hornback
Director of Business Development

JMH:tbm

Attachments

cc: Rod Howery
Louis Vela

Emeryville Project 8/1/2005

Attendant Assist Service - Preliminary Estimate of Operating Expense

Christie Avenue Lot

Assumes (2) parking attendants providing 16 hours of coverage per day from 8:00 a.m. - 6:00 p.m. Monday - Friday

All Costs shown in 2005 dollars

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Total	AVG.
Operating Expense														
Payroll	$ 3,360	$ 3,680	$ 3,520	$ 3,360	$ 3,520	$ 3,520	$ 3,520	$ 3,200	$ 3,680	$ 3,200	$ 3,680	$ 3,520	$ 41,760	$ 3,480
Vacation/HolidaySick Accrual	$ 220	$ 241	$ 230	$ 220	$ 230	$ 230	$ 230	$ 209	$ 241	$ 209	$ 241	$ 230	$ 2,731	$ 228
Total Payroll	**$ 3,580**	**$ 3,921**	**$ 3,750**	**$ 3,580**	**$ 3,750**	**$ 3,750**	**$ 3,750**	**$ 3,409**	**$ 3,921**	**$ 3,409**	**$ 3,921**	**$ 3,750**	**$ 44,491**	**$ 3,708**
														$ -
Payroll Taxes	$ 435	$ 476	$ 456	$ 435	$ 456	$ 287	$ 287	$ 261	$ 300	$ 261	$ 300	$ 287	$ 4,241	$ 353
Worker's Compensation	$ 588	$ 644	$ 616	$ 588	$ 616	$ 616	$ 616	$ 560	$ 644	$ 560	$ 644	$ 616	$ 7,310	$ 609
401K Plan Expense	$ 36	$ 39	$ 38	$ 36	$ 38	$ 38	$ 38	$ 34	$ 39	$ 34	$ 39	$ 38	$ 445	$ 37
Health & Welfare	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 18,312	$ 1,526
Uniforms	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 1,247	$ 104
Insurance	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 558	$ 6,696	$ 558
Booth Rental	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 275	$ 275	$ 275	$ 275	$ 275	$ 275	$ 3,150	$ 263
Tickets. Forms, Supplies	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 165	$ 165	$ 165	$ 165	$ 165	$ 165	$ 1,890	$ 158
Auto Damage	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 550	$ 550	$ 550	$ 550	$ 550	$ 550	$ 6,300	$ 525
EDP & Accounting Fees	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 1,800	$ 150
Supervision Fee	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 3,000	$ 250
Miscellaneous Expense	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 600	$ 50
Management Fee	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 12,000	$ 1,000
Start up Costs	$ 1,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,500	$ 125
Total Other Direct	**$ 7,097**	**$ 5,697**	**$ 5,648**	**$ 5,597**	**$ 5,648**	**$ 5,479**	**$ 5,569**	**$ 5,483**	**$ 5,611**	**$ 5,483**	**$ 5,611**	**$ 5,569**	**$ 68,491**	**$ 5,708**
Total Direct Expenses	**$ 10,677**	**$ 9,618**	**$ 9,398**	**$ 9,177**	**$ 9,398**	**$ 9,229**	**$ 9,319**	**$ 8,892**	**$ 9,532**	**$ 8,892**	**$ 9,532**	**$ 9,319**	**$ 112,982**	**$ 9,415**

Note: All of the foregoing costs are estimates and subject to change. Startup costs covers basic signage and equipment only.

Prepared by Ampco System Parking

Emeryville Project 8/1/2005

Attendant Assist Service - Preliminary Estimate of Operating Expense

Powell St. Lot

Assumes (2) parking attendants providing 16 hours of coverage per day from 8:00 a.m. - 6:00 p.m. Monday - Friday

All Costs shown in 2005 dollars

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Total	AVG.
Operating Expense														
Payroll	$ 3,360	$ 3,680	$ 3,520	$ 3,360	$ 3,520	$ 3,520	$ 3,520	$ 3,200	$ 3,680	$ 3,200	$ 3,680	$ 3,520	$ 41,760	$ 3,480
Vacation/HolidaySick Accrual	$ 220	$ 241	$ 230	$ 220	$ 230	$ 230	$ 230	$ 209	$ 241	$ 209	$ 241	$ 230	$ 2,731	$ 228
Total Payroll	**$ 3,580**	**$ 3,921**	**$ 3,750**	**$ 3,580**	**$ 3,750**	**$ 3,750**	**$ 3,750**	**$ 3,409**	**$ 3,921**	**$ 3,409**	**$ 3,921**	**$ 3,750**	**$ 44,491**	**$ 3,708**
														$ -
Payroll Taxes	$ 435	$ 476	$ 456	$ 435	$ 456	$ 287	$ 287	$ 261	$ 300	$ 261	$ 300	$ 287	$ 4,241	$ 353
Worker's Compensation	$ 588	$ 644	$ 616	$ 588	$ 616	$ 616	$ 616	$ 560	$ 644	$ 560	$ 644	$ 616	$ 7,310	$ 609
401K Plan Expense	$ 36	$ 39	$ 38	$ 36	$ 38	$ 38	$ 38	$ 34	$ 39	$ 34	$ 39	$ 38	$ 445	$ 37
Health & Welfare	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 1,526	$ 18,312	$ 1,526
Uniforms	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 104	$ 1,247	$ 104
Insurance	$ 515	$ 515	$ 515	$ 515	$ 515	$ 515	$ 566	$ 566	$ 566	$ 566	$ 566	$ 566	$ 6,485	$ 540
Booth Rental	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 275	$ 275	$ 275	$ 275	$ 275	$ 275	$ 3,150	$ 263
Tickets, Forms, Supplies	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 165	$ 165	$ 165	$ 165	$ 165	$ 165	$ 1,890	$ 158
Auto Damage	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 550	$ 550	$ 550	$ 550	$ 550	$ 550	$ 6,300	$ 525
EDP & Accounting Fees	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 150	$ 1,800	$ 150
Supervision Fee	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 3,000	$ 250
Miscellaneous Expense	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 50	$ 600	$ 50
Management Fee	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 12,000	$ 1,000
Start up Costs	$ 1,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,500	$ 125
Total Other Direct	**$ 7,054**	**$ 5,654**	**$ 5,604**	**$ 5,554**	**$ 5,604**	**$ 5,435**	**$ 5,577**	**$ 5,491**	**$ 5,619**	**$ 5,491**	**$ 5,619**	**$ 5,577**	**$ 68,280**	**$ 5,690**
Total Direct Expenses	**$ 10,633**	**$ 9,575**	**$ 9,354**	**$ 9,133**	**$ 9,354**	**$ 9,185**	**$ 9,327**	**$ 8,901**	**$ 9,540**	**$ 8,901**	**$ 9,540**	**$ 9,327**	**$ 112,771**	**$ 9,398**

Note: All of the foregoing costs are estimates and subject to change. Startup costs covers basic signage and equipment only.

Prepared by Ampco System Parking

Emeryville Project 8/1/2005

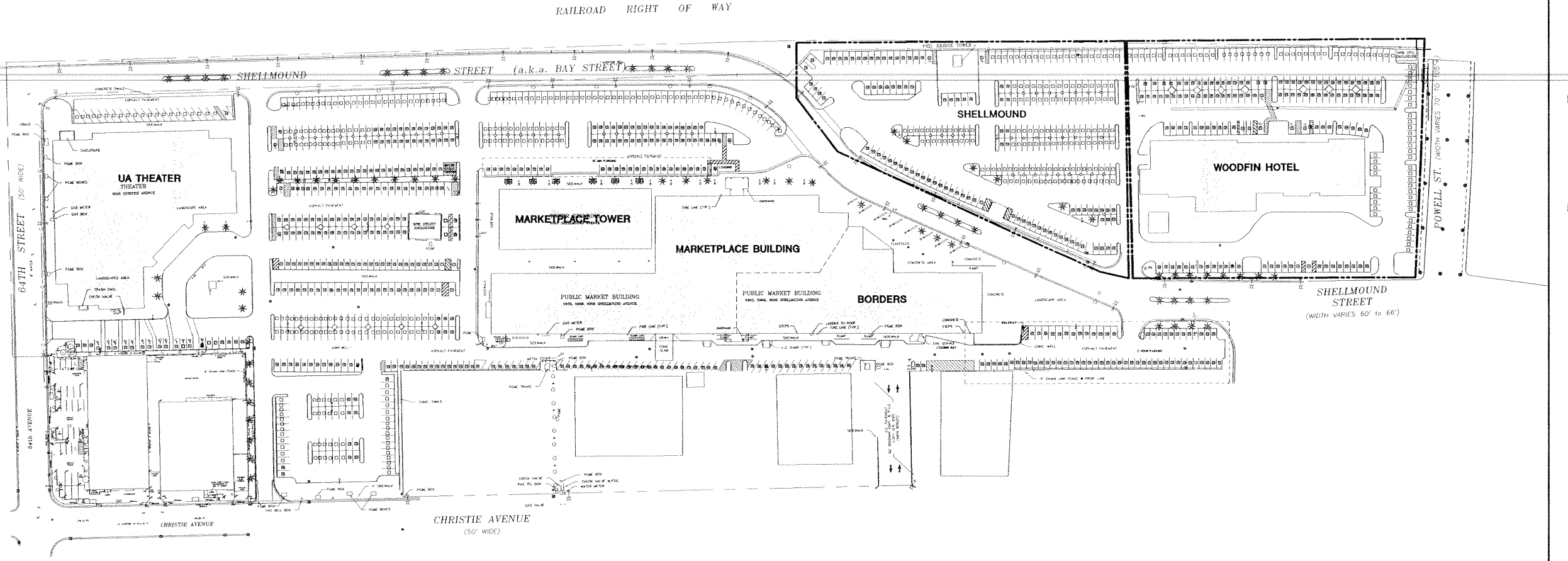
Attendant Assist Service - Preliminary Estimate of Operating Expense

Notes to Proposed Budget

All estimated costs shown apply to each lot separately and are based on current (2005) costs

Operating Expenses	
Payroll	Based on 16 Hours per Day of Staffing @ $10.00/hr.
Vacation/HolidaySick Accrual	6.54% of on-site labor
Total Payroll	**Total of Actual and Accrued payroll amounts; basis for calculation of p/r taxes, workers comp. and other benefits**
Payroll Taxes	Estimated @ 9.5% of Total Payroll over 1st year; Actual amounts will vary by month, based on total wages paid to individuals
Worker's Compensation	16.43% of Total Labor
401K Plan Expense	Estimate based on 1% of on-site payroll. Will vary depending on the number and level of employees participating.
Health & Welfare	Est. based on current rate of $763/mo. per employee X 2 employees
Uniforms	(2) employees @ $12/week each - full uniform package (w/foul weather gear) and laundry service
Insurance	Current valet rate of $65.01 per stall per year, based on maximum capacity of 103 cars (Christie lot) or 95 cars (Powell lot)
Booth Rental	Estimate cost to rent a basic valet booth
Tickets, Forms, Supplies	Estimated cost to provide these basic operating supplies
Auto Damage	Estimate only - Client will be charged actuals in this category, subject to a $2,500 dedcutible per occurrence.
EDP & Accounting Fees	Fixed cost to provide off-site administrative services
Supervision Fee	Fixed cost to provide off-site management and supervisory support services
Miscellaneous Expense	Est. cost to provide miscellaneous items which may be incurred in operation of facility
Management Fee	Ampco's profit for providing valet parking services
Start up costs	Estimated costs for locking key boxes, cones, and basic signage
Total Other Direct	**Total of all costs not including Total Payrol**
Total Direct Expenses	**Total of all operating costs including Total Payrol**

Please note: ALL COSTS DESCRIBED (WITH THE EXCEPTION OF THE FIXED EDP, SUPERVISION AND MANAGEMENT FEE) ARE ESTIMATES AND WILL VARY EACH MONTH. CLIENT WILL BE CHARGED AMPCO'S ACTUAL COST OF PROVIDING ALL GOODS AND SERVICES REQUIRED IN THE PROVISION OF THE SERVICE, WITH EACH COST ITEMIZED ON A MONTHLY STATEMENT, SUPPORTED BY FULL BACKUP (PHOTOCOPY OF INVOICE) TO SUPPORT EXPENSE.



P0 - EXISITING PARKING REQUIREMENT

SCALE : 1" = 60'-0"

1,067 STALLS REQUIRED BY O.P.A. 3.2.4

O.P.A. IS THE OWNER PARTICIPATION AGREEMENT THAT INCLUDES THE WOODFIN, THE MARKETPLACE, AND THE SHELLMOUND PROPERTIES.

60 0 120 240

SCALE: 1" = 60'-0"

© WATRY DESIGN, INC. 2005

Architects - Engineers

WATRY DES

1700 Seaport Bl
Redwood City, Ca
Tel: 650.29
Fax: 650.2
E-mail: wdi@wat
www.watryde

P0 - EXISTING PARKING REQ

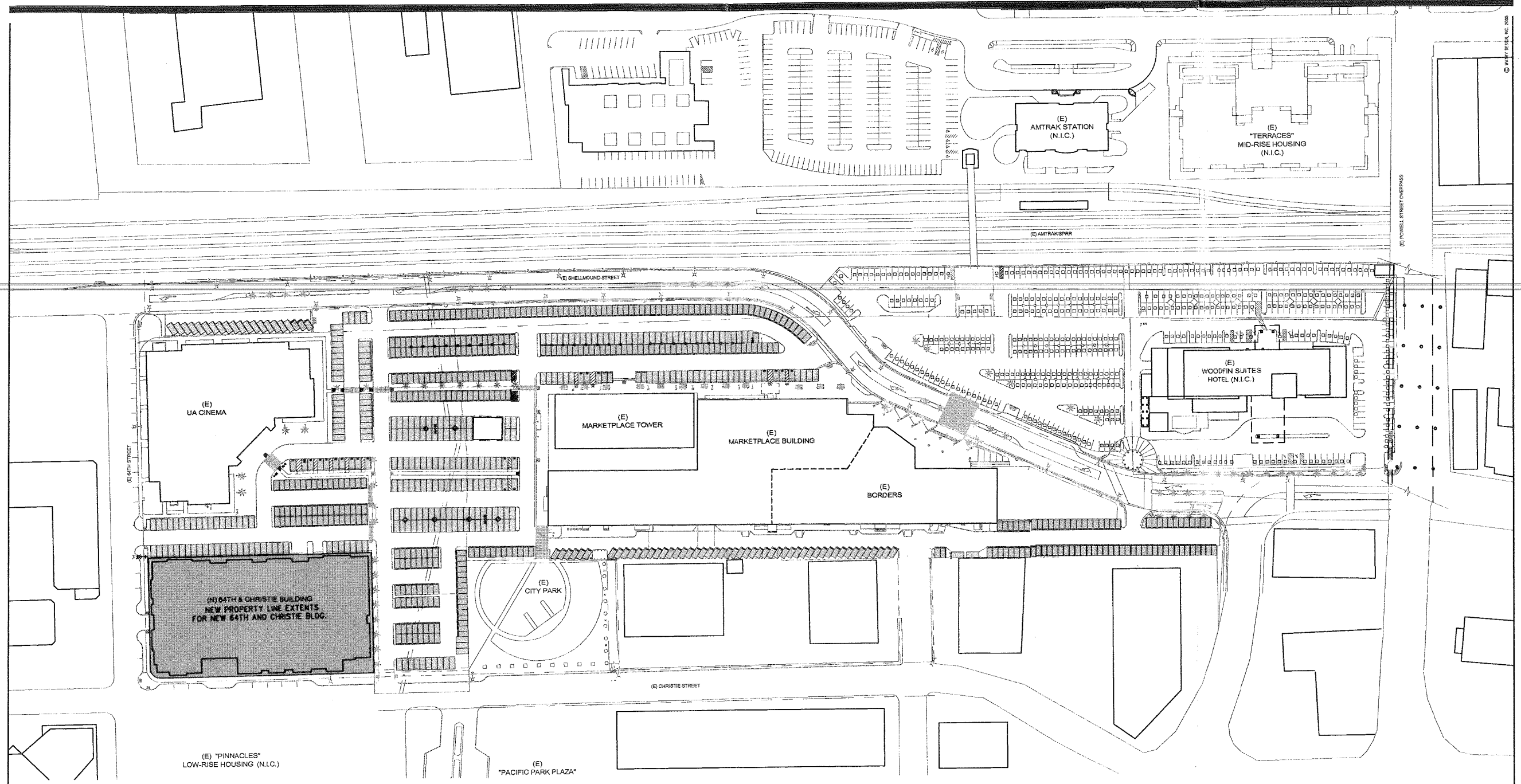
MARKETPLACE REDEVELOPMENT

ILLUSTRATIVE PLAN

JOB NO :
DATE :
DESIGN :
DRAWN :
CHECKED BY :
FILE NAME :

SHEET

P0



P1 - RECONFIGURED ON-GRADE PARKING PLAN

SCALE : 1" = 60'-0"

STALL COUNT

	STANDARD	COMPACT	ACCESSIBLE	RESERVED FOR VALET	TOTAL
MARKETPLACE/ UA THEATRE	298	478	21	-	797
SHELLMOUND	91	157	4	-	252
WOODFIN HOTEL	115	78	8	-	201
TOTAL	504	713	33	-	1,250
				DEMAND	1,067
				SURPLUS	183

NOTE: MARKETPLACE PARKING AT 60% COMPACT, COMPACT STALLS ARE 6" WIDER THAN CITY REGULATIONS.
NOTE: MOTORCYCLE AND BICYCLE PARKING NOT INCLUDED IN THIS SUMMATION.

60 0 120 240

SCALE: 1" = 60'-0"

© WATRY DESIGN, INC. 2005

Architects • Engineers • Parking Planners

WATRY DESIGN, INC.

1700 Seaport Blvd, Suite 210
Redwood City, California 94063
Tel: 650.298.8150
Fax: 650.298.8151
E-mail: wdi@watrydesign.com
www.watrydesign.com

P1 - RECONFIGURED ON-GRADE PARKING PLAN

MARKETPLACE REDEVELOPMENT PROJECT - PARKING ANALYSIS

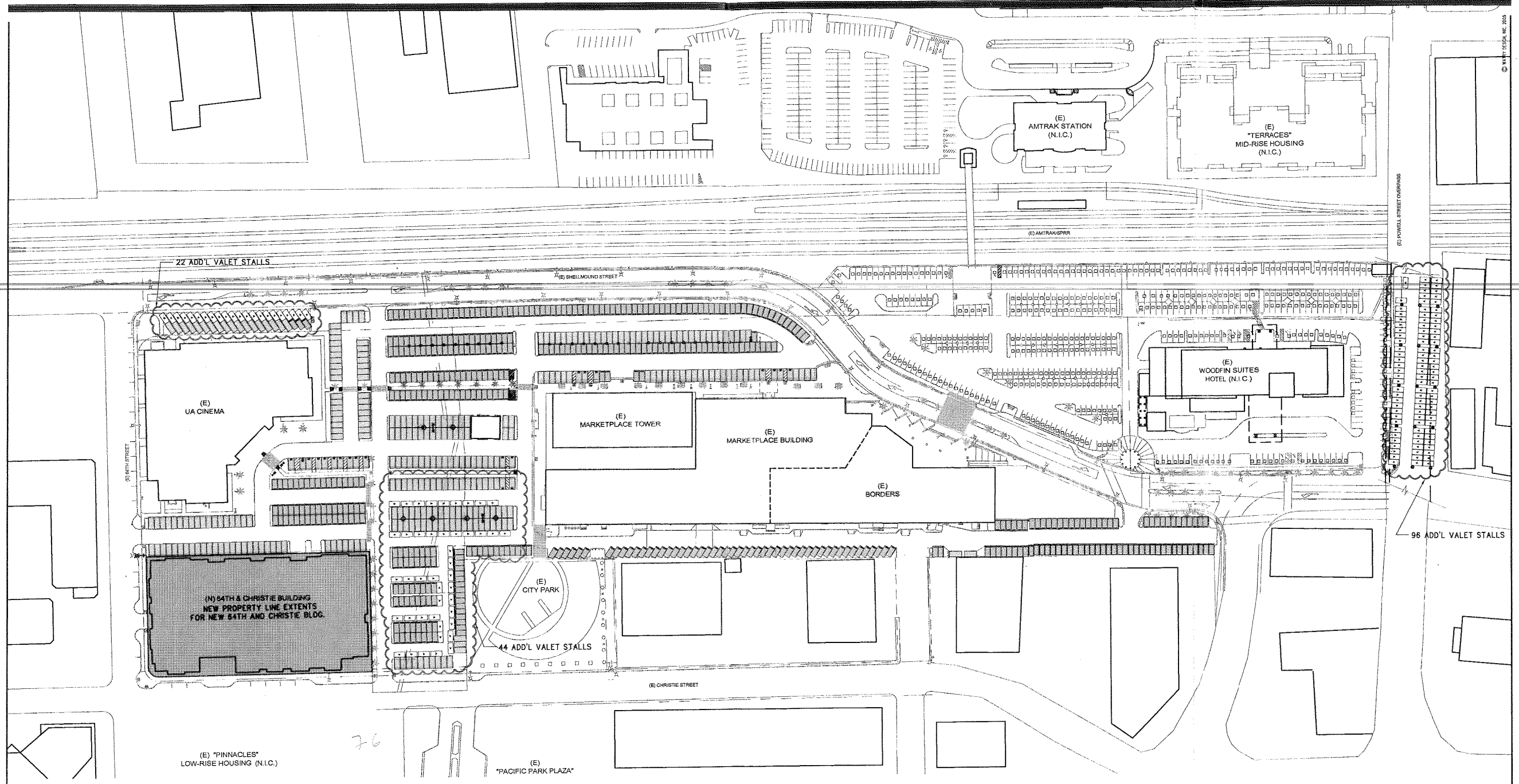
EMERYVILLE, CALIFORNIA

ILLUSTRATIVE PLAN

JOB NO	:	05043
DATE	:	10-05-05
DESIGN	:	SITES
DRAWN	:	SITES
CHECKED BY	:	LOCOCO
FILE NAME	:	0543P1

SHEET

P1



P1A - VALET ASSISTED PARKING OPTION (OFFICE ONLY)

SCALE : 1" = 60'-0"

STALL COUNT

	STANDARD	COMPACT	ACCESSIBLE	RESERVED FOR VALET	TOTAL
MARKETPLACE/ UA THEATRE	298	478	21	66	863
SHELLMOUND	91	156	4	-	251
WOODFIN HOTEL	115	79	8	-	202
POWELL ST. OVERPASS	-	-	-	96	96
TOTAL	504	713	33	162	1,412
				DEMAND	1,067
				SURPLUS	345

NOTE: MARKETPLACE PARKING AT 51% COMPACT, COMPACT STALLS ARE 6" WIDER THAN CITY REGULATIONS.
NOTE: MOTORCYCLE AND BICYCLE PARKING NOT INCLUDED IN THIS SUMMATION.

60 0 120 240

SCALE: 1" = 60'-0"

Architects · Engineers · Parking Planners

WATRY DESIGN, INC.

1700 Seaport Blvd, Suite 210
Redwood City, California 94063
Tel: 650.298.8150
Fax: 650.298.8151
E-mail: wdi@watrydesign.com
www.watrydesign.com

© WATRY DESIGN, INC. 2005

P1A - VALET ASSISTED PARKING OPTION (OFFICE ONLY)

MARKETPLACE REDEVELOPMENT PROJECT - PARKING ANALYSIS

EMERYVILLE, CALIFORNIA

ILLUSTRATIVE PLAN

JOB NO	:	05043
DATE	:	10-05-05
DESIGN	:	SITES
DRAWN	:	SITES
CHECKED BY	:	LOCOCO
FILE NAME	:	0543P1A

SHEET

P1A

MARKETPLACE REDEVELOPMENT PROJECT - PARKING ANALYSIS

EMERYVILLE, CALIFORNIA

P2A - SHELLMOUND BUILDING OCCUPANCY PLAN

WATRY DESIGN, INC.

1700 Seapoint Blvd, Suite 210
Redwood City, California 94063
Tel: 650.298.8150
Fax: 650.298.8151
E-mail: wdl@watrydesign.com
www.watrydesign.com

Architects · Engineers · Parking Planners

© WATRY DESIGN, INC. 2005

JOB NO	06043
DATE	10-05-06
DESIGN	SITES
DRAWN	SITES
CHECKED BY	LOCOCO
FILE NAME	06432A

SHEET

P2A

ILLUSTRATIVE PLAN

P2A - SHELLMOUND BUILDING OCCUPANCY PLAN

SCALE : 1" = 60'-0"

SCALE: 1" = 60'-0"

60 0 120 240

STALL COUNT					
	STANDARD	COMPACT	ACCESSIBLE	RESERVED FOR VALET	TOTAL
MARKETPLACE/ UA THEATRE	298	478	21	-	797
SHELLMOUND	160	369	11	-	540
WOODFIN HOTEL	116	79	8	-	202
TOTAL	573	926	40	-	1,539

NOTE: MARKETPLACE PARKING AT 60X COMPACT STALLS ARE 6" WIDER THAN CITY REGULATIONS.
NOTE: MOTORCYCLE AND BICYCLE PARKING NOT INCLUDED IN THIS SUMMATION.

DEMAND	1,376
SURPLUS	163

(E) "PACIFIC PARK PLAZA"

(E) "PINNACLES" LOW-RISE HOUSING (N.L.C.)

(E) CHRISTIE STREET

(E) CITY PARK

(N) 64TH & CHRISTIE BUILDING

(E) BORDERS

(E) MARKETPLACE BUILDING

(E) MARKETPLACE TOWER

(E) UA CINEMA

(E) 64TH STREET

(E) WOODFIN SUITES HOTEL (N.L.C.)

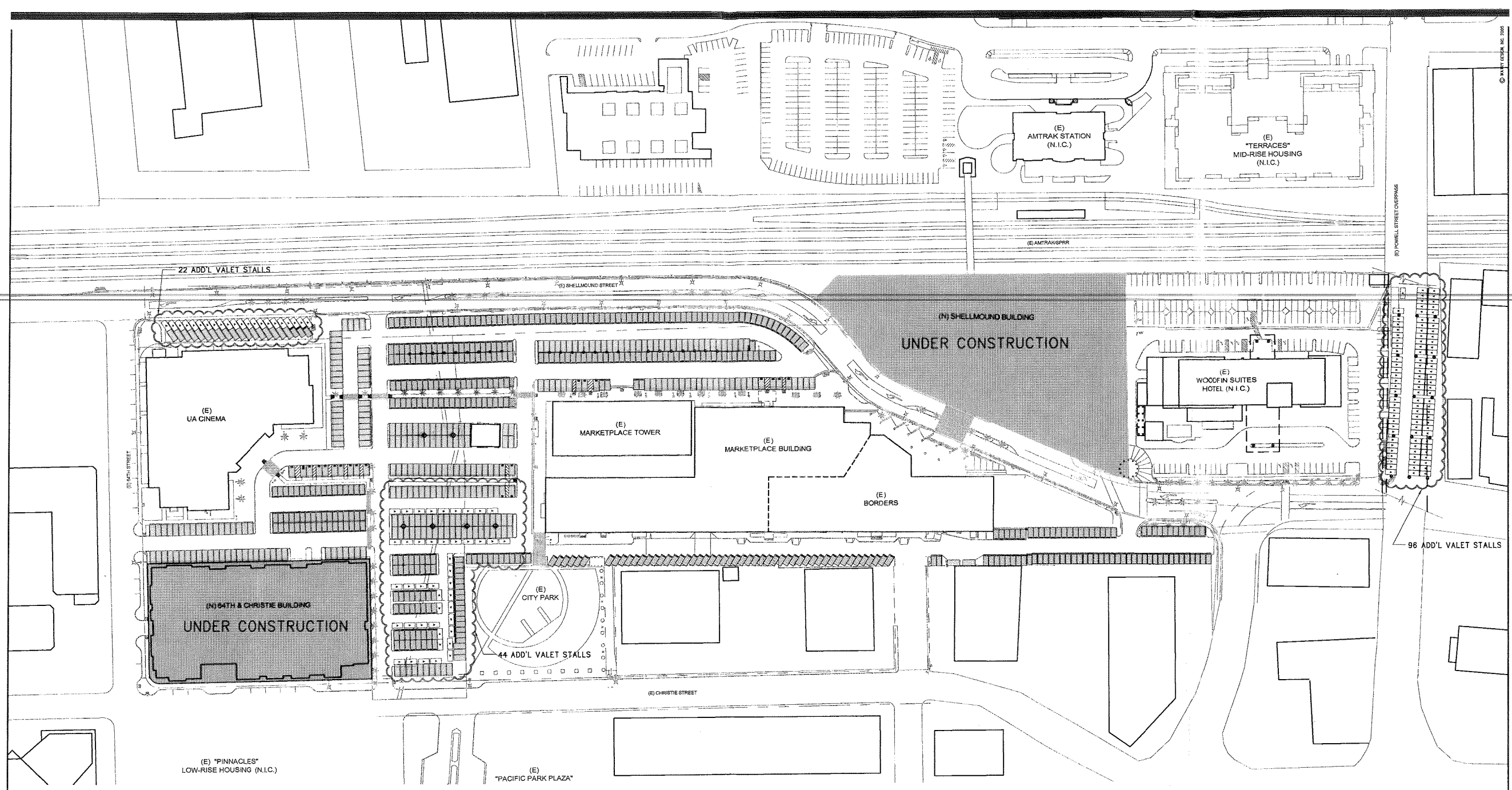
(E) SHELLMOUND STREET

(E) AMTRAK/BART

(E) POWELL STREET OVERPASS

(E) AMTRAK STATION (N.L.C.)

(E) "TERRACES" MID-RISE HOUSING (N.L.C.)



P2 - SHELLMOUND BUILDING CONSTRUCTION IMPACT PLAN

SCALE : 1" = 60'-0"

STALL COUNT					
	STANDARD	COMPACT	ACCESSIBLE	RESERVED FOR VALET	TOTAL
MARKETPLACE/ UA THEATRE	298	478	21	66	863
SHELLMOUND	0	0	0	-	0
WOODFIN HOTEL	115	79	8	-	202
POWELL ST. OVERPASS	-	-	-	96	96
TOTAL	413	557	29	162	1,161
				DEMAND	1,067
				SURPLUS	94

NOTE: MARKETPLACE PARKING AT 60% COMPACT, COMPACT STALLS ARE 6" WIDER THAN CITY REGULATIONS.
NOTE: MOTORCYCLE AND BICYCLE PARKING NOT INCLUDED IN THIS SUMMATION

60 0 120 240

SCALE: 1" = 60'-0"

Architects · Engineers
WATRY DESI
1700 Seaport Blv
Redwood City, Cal
Tel: 650.29
Fax: 650.2
E-mail: wdd@watr
www.watryde

© WATRY DESIGN, INC. 2005

P2 - SHELLMOUND BUILDING CONSTRUCTION IMPACT PLAN

MARKETPLACE REDEVELOPMENT

ILLUSTRATIVE PLAN

JOB NO :
DATE :
DESIGN :
DRAWN :
CHECKED BY :
FILE NAME :

SHEET

P2

APPENDIX F:
PROJECT ALTERNATIVES INFORMATION

TABLE F-1
ALTERNATIVE 2 – REDUCED PROJECT

Project Component	Size	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shellmound Building Residential	0 dwelling units	0	0	0	0	0	0	0	0	0
Shellmound Building Retail	6,460 square feet	4	2	6	8	8	16	14	12	26
Shellmound Building Restaurant	1,140 square feet	4	4	8	4	3	7	8	5	13
Shellmound Building Office	157,000 square feet	203	28	231	38	185	223	33	28	61
64th & Christie Residential	140 dwelling units	10	49	59	46	22	68	34	29	63
64th & Christie Retail	5,100 square feet	3	2	5	6	7	13	11	10	21
64th & Christie Restaurant	900 square feet	3	3	6	3	2	5	6	4	10
Retail Pads	17,000 square feet	10	6	16	20	22	42	36	33	69
Restaurant Pads	3,000 square feet	10	9	19	11	7	18	22	13	35
Net New Trips		***247***	***103***	***350***	***136***	***256***	***392***	***164***	***134***	***298***

Source: Fehr & Peers, 2006.

TABLE F-2
ALTERNATIVE 3 – RESIDENTIAL TOWER PHASE 1&2

Project Component	Size	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shellmound Building Residential	180 dwelling units	13	63	76	59	29	88	43	38	81
Shellmound Building Retail	38,560 square feet	23	15	38	46	50	96	81	74	155
Shellmound Building Restaurant	6,810 square feet	23	21	44	26	17	43	49	29	78
Shellmound Building Office	0 square feet	0	0	0	0	0	0	0	0	0
64th & Christie Residential	208 dwelling units	15	73	88	69	33	102	50	44	94
64th & Christie Retail	20,400 square feet	12	8	20	24	27	51	43	39	82
64th & Christie Restaurant	3,600 square feet	12	11	23	14	9	23	26	15	41
Retail Pads	17,000 square feet	10	6	16	20	22	42	36	33	69
Restaurant Pads	3,000 square feet	10	9	19	11	7	18	22	13	35
Additional Retail (UA Site)	136,000 square feet	82	52	134	163	177	340	284	262	546
Additional Restaurant (UA Site)	24,000 square feet	82	76	158	91	58	149	172	101	273
Net New Trips		***282***	***334***	***616***	***523***	***429***	***952***	***806***	***648***	***1,454***

Source: Fehr & Peers, 2006.

TABLE F-3
ALTERNATIVE 4 – MAIN STREET ALTERNATIVE

Project Component	Size	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shellmound Building Residential	288 dwelling units	20	101	121	95	46	141	69	60	129
Shellmound Building Retail	39,530 square feet	24	15	39	47	51	98	83	76	159
Shellmound Building Restaurant	6,980 square feet	24	22	46	27	17	44	50	29	79
Shellmound Building Office	190,000 square feet	245	34	279	46	224	270	40	34	74
64th & Christie Residential	0 dwelling units	0	0	0	0	0	0	0	0	0
64th & Christie Retail	20,400 square feet	12	8	20	24	27	51	43	39	82
64th & Christie Restaurant	3,600 square feet	12	11	23	14	9	23	26	15	41
64th & Christie Office	225,000 square feet	290	41	331	54	266	320	47	41	88
Retail Pads	32,300 square feet	19	12	31	39	42	81	68	62	130
Restaurant Pads	5,700 square feet	19	18	37	22	14	36	41	24	65
Additional Retail (UA Site)	76,500 square feet	46	29	75	92	99	191	160	148	308
Additional Restaurant (UA Site)	13,500 square feet	46	43	89	51	33	84	97	57	154
New Mixed Use Building Residential	100 dwelling units	7	35	42	33	16	49	24	21	45
New Mixed Use Building Retail	10,630 square feet	6	4	10	13	14	27	22	21	43
New Mixed Use Building Restaurant	1,880 square feet	6	6	12	7	5	12	13	8	21
Net New Trips		***776***	***379***	***1,155***	***564***	***863***	***1,427***	***783***	***635***	***1,418***

Source: Fehr & Peers, 2006.

TABLE F-4
EXISTING CONDITIONS PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	43 42	D D	43 42	D D	43 43	D D	43 42	D D	43 43	D D
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	32 40	C D	33 42	C D	33 42	C D	36 44	D D	34 44	C D
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 8 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 8 (14) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street	AWSC	AM PM SAT	9 50 29	A E D	10 ***72*** ***53***	A ***F*** ***F***	9 ***81*** ***41***	A ***F*** ***E***	11 ***113*** ***135***	B ***F*** ***F***	15 ***164*** ***122***	B ***F*** ***F***
5. 65th Street/Overland Avenue	Signal	AM PM SAT	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --	-- -- --
6. 65th Street/Hollis Street	Signal	AM PM	14 23	B C	14 25	B C	14 25	B C	15 31	B C	15 41	B D
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 8	A A A	8 9 8	A A A	8 9 8	A A A	8 9 8	A A A	8 9 8	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	1 (10) 2 (16) 1 (16)	A (A) A (C) A (C)	2 (11) 2 (19) 2 (21)	A (B) A (C) A (C)	2 (11) 2 (19) 1 (19)	A (B) A (C) A (C)	2 (12) 4 (34) 9 (86)	A (B) A (D) A (F)	2 (14) 7 (49) 5 (55)	A (B) A (E) A (F)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	8 11 17	A B B	9 10 24	A A C	15 12 19	B B B	9 11 19	A B B	20 15 30	B B C
10. Shellmound Way/ Shellmound Street	Signal	AM PM SAT	33 22 13	C C B	33 22 19	C C B	33 22 16	C C B	33 22 21	C C C	43 24 29	D C C
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM	15 37	B D	15 38	B D	15 37	B D	15 40	B D	15 44	B D

TABLE F-4
EXISTING CONDITIONS PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
		SAT	16	B	16	B	16	B	18	B	18	B
12. Powell Street/Frontage Road	Signal	AM	19	B	19	B	19	B	19	B	19	B
		PM	18	B	18	B	18	B	19	B	20	B
		SAT	22	C	22	C	22	C	23	C	23	C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM	26	C	27	C	31	C	28	C	37	D
		PM	73	E	***83***	***F***	***80***	***F***	***88***	***F***	***115***	***F***
		SAT	56	E	***62***	***E***	58	E	***66***	***E***	***72***	***E***
14. Powell Street/Christie Avenue	Signal	AM	29	C	28	C	29	C	29	C	36	C
		PM	46	D	46	D	46	D	52	D	***64***	***E***
		SAT	46	D	45	D	49	D	***62***	***E***	***68***	***E***
15. Christie Avenue/ Shellmound Street	Signal	AM	20	B	21	C	21	C	21	C	21	C
		PM	41	D	41	D	41	D	41	D	41	D
		SAT	31	C	32	C	31	C	32	C	32	C
16. Powell Street/Hollis Street	Signal	AM	30	C	30	C	31	C	30	C	32	C
		PM	51	D	55	D	54	D	***56***	***E***	***61***	***E***
		SAT	24	C	24	C	24	C	26	C	26	C
17. Stanford Avenue/San Pablo Avenue	Signal	AM	29	C	29	C	29	C	29	C	29	C
		PM	39	D	39	D	39	D	39	D	40	D
18. 40th Street/Horton Street	Signal	AM	21	C	21	C	21	C	21	C	21	C
		PM	28	C	28	C	28	C	29	C	29	C
19. 40th Street/Hollis Street	Signal	AM	26	C	27	C	27	C	27	C	27	C
		PM	38	D	39	D	39	D	41	D	44	D
20. 40th Street/Harlan Street	SSSC	AM	3 (24)	A (C)	3 (25)	A (C)	3 (25)	A (C)	3 (26)	A (D)	3 (27)	A (D)
		PM	5 (53)	A (F)	5 (57)	A (F)	6 (57)	A (F)	6 (63)	A (F)	6 (70)	A (F)
21. 40th Street/Emery Street	Signal	AM	24	C	24	C	24	C	24	C	24	C
		PM	32	C	32	C	32	C	32	C	32	C
		SAT	21	C	21	C	21	C	21	C	21	C
22. 40th Street/San Pablo	Signal	AM	33	C	33	C	33	C	33	C	34	C
		PM	45	D	45	D	45	D	47	D	47	D

TABLE F-4
EXISTING CONDITIONS PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
Avenue		SAT	39	D	39	D	39	D	41	D	40	D
23. 40th Street/Adeline Street	Signal	AM PM	12 12	B B	12 12	B B	12 12	B B	12 12	B B	12 12	B B
24. Mandela Pkwy/Horton Street	AWSC	AM PM	8 14	A B	8 15	A C	8 15	A B	8 17	A C	8 18	A C
25. MacArthur Boulevard/Emery Street	Signal	AM PM	24 11	C B	24 11	C B	24 11	C B	24 11	C B	24 11	C B
26. Adeline Street/San Pablo Avenue	Signal	AM PM	15 19	B B	15 19	B B	15 19	B B	15 19	B B	15 19	B B
27. 36th Street/San Pablo Avenue	Signal	AM PM	28 24	C C	28 24	C C	28 24	C C	28 25	C C	28 24	C C
28. 35th Street/San Pablo Avenue	Signal	AM PM	13 30	B C	13 30	B C	13 30	B C	13 30	B C	13 30	B C
29. Shellmound Street/ Marketplace Driveway	AWSC	AM PM SAT	8 20 16	A C C	9 50 55	A E F	9 47 26	A E D	9 68 90	A F F	16 > 100 > 100	C F F

Notes: **Results in bold indicate deficient levels of service.**

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.

Source: Fehr & Peers, 2007.

TABLE F-5
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM PM	46 50	D D	46 50	D D	46 50	D D	46 50	D D	46 51	D D
2. Ashby Avenue/San Pablo Avenue	Signal	AM PM	32 81	C F	33 84	C F	33 85	C F	34 ***92***	C ***F***	36 ***95***	D ***F***
3. 65th Street/Christie Avenue	SSSC	AM PM SAT	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 7 (13) 8 (11)	A (B) A (B) A (B)	6 (11) 8 (14) 8 (11)	A (B) A (B) A (B)	6 (11) 8 (14) 8 (11)	A (B) A (B) A (B)
4. 65th Street/Shellmound Street 5. 65th Street/Overland Avenue	Signal	AM PM SAT	25 46 32	C D C	25 51 32	C D C	26 52 30	C D C	37 ***58*** 38	D ***E*** D	28 ***62*** 37	C ***E*** D
6. 65th Street/Hollis Street	Signal	AM PM	15 32	B C	16 36	B D	15 40	B D	18 49	B D	18 ***64***	C ***E***
7. 64th Street/Christie Avenue	AWSC	AM PM SAT	8 9 8	A A A	8 9 8	A A A	8 9 8	A A A	8 9 9	A A A	8 10 9	A A A
8. 64th Street/Shellmound Street	SSSC	AM PM SAT	2 (11) 2 (17) 2 (26)	A (B) A (C) A (D)	2 (12) 2 (21) 3 (43)	A (B) A (C) A (E)	2 (12) 2 (22) 2 (32)	A (B) A (C) A (D)	3 (14) 5 (43) ***69 (> 100)***	A (B) A (E) ***F (F)***	2 (18) 8 (63) 32 (> 100)	A (C) A (F) D (F)
9. Shellmound Way/Christie Avenue	Signal	AM PM SAT	30 19 25	C B C	29 21 30	C C C	32 21 26	C C C	30 23 40	C C D	46 53 43	C C D
10. Shellmound Way/ Shellmound Street	Signal	AM PM SAT	30 25 20	C C B	30 25 24	C C C	53 28 22	D C C	30 22 26	C C C	41 27 34	D C C
11. I-80 Hook Ramps/Frontage Road	Signal	AM PM SAT	15 42 19	B D B	15 44 21	B D C	16 44 21	B D C	15 47 27	B D C	16 ***74*** 26	B ***E*** C

TABLE F-5
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
12. Powell Street/Frontage Road	Signal	AM	18	B	18	B	19	B	18	B	18	B
		PM	20	C	22	C	22	C	24	C	31	C
		SAT	23	C	24	C	23	C	25	C	25	C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM	28	C	30	C	41	D	31	C	41	D
		PM	101	F	***114***	***F***	***121***	***F***	***121***	***F***	***151***	***F***
		SAT	93	F	***106***	***F***	***99***	***F***	***118***	***F***	***124***	***F***
14. Powell Street/Christie Avenue	Signal	AM	33	C	33	C	36	D	33	C	39	D
		PM	86	F	86	F	86	F	***92***	***F***	***101***	***F***
		SAT	108	F	111	F	110	F	***126***	***F***	***132***	***F***
15. Christie Avenue/ Shellmound Street	Signal	AM	12	B	12	B	12	B	12	B	12	B
		PM	24	C	24	C	23	C	22	C	22	C
		SAT	24	C	24	C	24	C	25	C	24	C
16. Powell Street/Hollis Street	Signal	AM	37	D	38	D	40	D	38	D	42	D
		PM	80	E	84	F	***90***	***F***	***88***	***F***	***99***	***F***
		SAT	28	C	30	C	29	C	34	C	35	C
17. Stanford Avenue/San Pablo Avenue	Signal	AM	31	C	31	C	31	C	31	C	31	C
		PM	69	E	69	E	69	E	70	E	70	E
18. 40th Street/Horton Street	Signal	AM	23	C	23	C	23	C	23	C	24	C
		PM	34	C	34	C	34	C	36	D	36	D
19. 40th Street/Hollis Street	Signal	AM	28	C	29	C	29	C	31	C	32	C
		PM	50	D	52	D	***56***	***E***	***57***	***E***	***63***	***E***
20. 40th Street/Harlan Street	SSSC	AM	2 (36)	A (E)	2 (36)	A (E)	2 (38)	A (E)	3 (38)	A (E)	3 (40)	A (E)
		PM	9 (125)	A (F)	10 (135)	A (F)	10 (141)	A (F)	11 (150)	B (F)	12 (167)	B (F)
21. 40th Street/Emery Street	Signal	AM	23	C	23	C	23	C	23	C	23	C
		PM	36	D	36	D	37	D	37	D	39	D
		SAT	24	C	24	C	24	C	24	C	24	C
22. 40th Street/San Pablo Avenue	Signal	AM	36	D	36	D	36	D	36	D	36	D
		PM	72	E	74	E	75	E	***78***	***E***	***81***	***F***
		SAT	70	E	72	E	71	E	***76***	***E***	***76***	***E***

TABLE F-5
FUTURE 2010 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
23. 40th Street/Adeline Street	Signal	AM PM	15 15	B B	15 15	B B	15 15	B B	15 15	B B	15 15	B B
24. Mandela Pkwy/Horton Street	AWSC	AM PM	9 22	A C	9 24	A C	9 24	A C	10 30	A D	10 32	A D
25. MacArthur Boulevard/Emery Street	Signal	AM PM	15 18	B B	15 18	B B	15 18	B B	15 18	B B	15 18	B B
26. Adeline Street/San Pablo Avenue	Signal	AM PM	22 36	C D	22 36	C D	22 36	C D	22 36	C D	22 36	C D
27. 36th Street/San Pablo Avenue	Signal	AM PM	28 59	C E	28 60	C E	28 59	C E	28 60	C E	28 60	C E
28. 35th Street/San Pablo Avenue	Signal	AM PM	18 38	B D	18 38	B D	18 38	B D	18 38	B D	18 38	B D
29. Shellmound Street/ Marketplace Driveway	AWSC	AM PM SAT	8 34 28	A D D	9 51 > 100	A F F	9 73 > 100	A F F	10 > 100 > 100	A F F	18 > 100 > 100	C F F

Notes: **Results in bold indicate deficient levels of service.**

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.

Source: Fehr & Peers, 2007.

TABLE F-6
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
1. Ashby Avenue/7th Street	Signal	AM	59	E	60	E	60	E	60	E	61	E
		PM	63	E	64	E	64	E	65	E	66	E
2. Ashby Avenue/San Pablo Avenue	Signal	AM	40	D	41	D	40	D	43	D	50	D
		PM	128	F	***135***	***F***	***134***	***F***	***148***	***F***	***150***	***F***
3. 65th Street/Christie Avenue	SSSC	AM	6 (12)	A (B)	7 (12)	A (B)	6 (12)	A (B)	7 (12)	A (B)	7 (12)	A (B)
		PM	8 (14)	A (B)	8 (15)	A (B)	8 (15)	A (B)	8 (16)	A (C)	8 (16)	A (C)
		SAT	8 (11)	A (B)	8 (11)	A (B)	8 (11)	A (B)	8 (11)	A (B)	8 (11)	A (B)
4. 65th Street/Shellmound Street	Signal	AM	31	C	32	C	32	C	36	D	42	D
		PM	96	F	***102***	***F***	***136***	**F**	***131***	***F***	***128***	***F***
5. 65th Street/Overland Avenue		SAT	43	D	53	D	55	D	***86***	***F***	***61***	***E***
6. 65th Street/Hollis Street	Signal	AM	15	B	16	B	16	B	19	B	20	B
		PM	40	D	47	D	47	D	***61***	***E***	***76***	***E***
7. 64th Street/Christie Avenue	AWSC	AM	8	A	8	A	8	A	8	A	8	A
		PM	9	A	9	A	9	A	10	A	10	A
		SAT	9	A	9	A	9	A	9	A	9	A
8. 64th Street/Shellmound Street	SSSC	AM	2 (12)	A (B)	2 (13)	A (B)	2 (13)	A (B)	3 (16)	A (C)	6 (58)	A (F)
		PM	2 (20)	A (C)	2 (27)	A (D)	2 (25)	A (C)	16 (173)	C (F)	25 (228)	C (F***)***
		SAT	2 (46)	A (E)	8 (127)	A (F)	5 (76)	A (F)	***>100 (>100)***	***F (F)***	***>100 (>100)***	***F (F)***
9. Shellmound Way/Christie Avenue	Signal	AM	34	C	36	D	34	C	34	C	45	D
		PM	19	B	21	C	21	C	22	C	29	C
		SAT	28	C	32	C	29	C	47	D	50	D
10. Shellmound Way/ Shellmound Street	Signal	AM	29	C	29	C	32	D	29	C	35	C
		PM	24	C	24	C	27	C	25	C	31	C
		SAT	20	B	24	C	22	C	25	C	30	C
11. I-80 Hook Ramps/Frontage Road	Signal	AM	16	B	16	B	16	B	16	B	16	B
		PM	42	D	43	D	43	D	46	D	***111***	***F***
		SAT	20	B	20	B	20	B	22	C	22	C
12. Powell Street/Frontage Road	Signal	AM	18	B	18	B	18	B	18	B	18	B
		PM	21	C	21	C	21	C	24	C	36	D

TABLE F-6
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
		SAT	22	C	22	C	22	C	23	C	22	C
13. Powell Street/I-80 Eastbound Ramps	Signal	AM	37	D	39	D	46	D	40	D	52	D
		PM	102	F	***115***	***F***	***114***	***F***	***124***	***F***	***151***	***F***
		SAT	101	F	***112***	***F***	***106***	***F***	***119***	***F***	***127***	***F***
14. Powell Street/Christie Avenue	Signal	AM	56	E	56	E	56	E	56	E	56	E
		PM	90	F	90	F	90	F	90	F	90	F
		SAT	136	F	136	F	137	F	137	F	138	F
15. Christie Avenue/Shellmound Street	Signal	AM	12	B	12	B	13	B	12	B	13	B
		PM	22	C	22	C	22	C	22	C	22	C
		SAT	23	C	23	C	23	C	24	C	23	C
16. Powell Street/Hollis Street	Signal	AM	51	D	51	D	52	D	52	D	***58***	***E***
		PM	114	F	***120***	***F***	***122***	***F***	***125***	***F***	***138***	***F***
		SAT	45	D	50	D	47	D	***58***	***E***	***60***	***E***
17. Stanford Avenue/San Pablo Avenue	Signal	AM	32	C	32	C	32	C	32	C	33	C
		PM	119	F	120	F	120	F	120	F	121	F
18. 40th Street/Horton Street	Signal	AM	37	D	37	D	37	D	37	D	37	D
		PM	127	F	128	F	128	F	***133***	***F***	***137***	***F***
19. 40th Street/Hollis Street	Signal	AM	35	D	38	D	37	D	41	D	42	D
		PM	82	F	85	F	***87***	***F***	***90***	***F***	***99***	***F***
20. 40th Street/Harlan Street	SSSC	AM	3 (68)	A (F)	3 (70)	A (F)	3 (71)	A (F)	3 (73)	A (F)	3 (79)	A (F)
		PM	>100 (>100)	F (F)	>100 (>100)	F (F)	>100 (>100)	F (F)	>100 (>100)	F (F)	>100 (>100)	F (F)
21. 40th Street/Emery Street	Signal	AM	29	C	29	C	29	C	29	C	29	C
		PM	104	F	106	F	107	F	***109***	***F***	***114***	***F***
		SAT	81	F	83	F	82	F	***88***	***F***	***88***	***F***
22. 40th Street/San Pablo Avenue	Signal	AM	45	D	45	D	45	D	45	D	45	D
		PM	142	F	145	F	145	F	***148***	***F***	***152***	***F***
		SAT	130	F	133	F	131	F	***138***	***F***	***138***	***F***
23. 40th Street/Adeline Street	Signal	AM	15	B	15	B	15	B	15	B	15	B
		PM	16	B	16	B	16	B	16	B	16	B
24. Mandela Pkwy/Horton Street	AWSC	AM	11	B	11	B	11	B	11	B	11	B
		PM	71	E	75	E	74	E	***85***	***F***	***86***	***F***

TABLE F-6
FUTURE 2030 PEAK HOUR INTERSECTION OPERATING CONDITIONS
WITH PROJECT ALTERNATIVES

Intersection	Control[1]	Peak Hour	Without Project		With Preferred Project		With Project Alternative 2		With Project Alternative 3		With Project Alternative 4	
			Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS	Delay (in seconds)[2]	LOS
25. MacArthur Boulevard/Emery Street	Signal	AM PM	21 86	C F	21 86	C F	21 86	C F	21 86	C F	21 86	C F
26. Adeline Street/San Pablo Avenue	Signal	AM PM	24 48	C D	24 50	C D	24 49	C D	24 50	C D	24 51	C D
27. 36th Street/San Pablo Avenue	Signal	AM PM	47 74	D E	48 74	D E	48 74	D E	48 74	D E	49 74	D E
28. 35th Street/San Pablo Avenue	Signal	AM PM	21 61	C E	21 62	C E	21 61	C E	21 62	C E	21 62	C E
29. Shellmound Street/ Marketplace Driveway	AWSC	AM PM SAT	8 32 32	A D D	9 56 > 100	A F F	9 75 > 100	A F F	10 > 100 > 100	A F F	18 > 100 > 100	C F F

Notes: **Results in bold indicate deficient levels of service.**

1. SSSC = side-street stop controlled intersection; AWSC = all-way stop controlled intersection; Signal = signalized intersection.
2. Average intersection control delay reported for signalized and all-way stop controlled intersections. Average intersection delay and worst case approach delay reported for side-street stop controlled intersections.

Source: Fehr & Peers, 2007.

APPENDIX B-2

ALTERNATIVES
LOS TRAFFIC MODELING OUTPUTS

- **Alternative 1: No Project (see Appendix B-1 Outputs for No Project Condition)**
- **Alternative 2: Reduced Project Alternative**
- **Alternative 3: Tower Alternative**
- **Alternative 4: Main Street Alternative**

SYNCHRO LOS SHEETS
ALTERNATIVE #2
BASE YEAR

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1001: Ashby (SR 13) & Seventh St — Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3388		1770	3522		1770	3433		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3388		1770	3522		1770	3433		1770	1863	1583
Volume (vph)	500	775	309	102	618	20	85	170	42	59	182	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	336	111	670	22	92	185	46	64	198	202
RTOR Reduction (vph)	0	33	0	0	2	0	0	21	0	0	0	173
Lane Group Flow (vph)	543	1145	0	111	690	0	92	210	0	64	198	29
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	55.1		10.6	31.1		11.4	11.4		15.9	15.9	15.9
Effective Green, g (s)	34.6	56.1		10.6	32.1		11.4	11.4		15.9	15.9	15.9
Actuated g/C Ratio	0.31	0.51		0.10	0.29		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1728		171	1028		183	358		258	269	229
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.05	c0.06		0.04	c0.11	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.66		0.65	0.67		0.50	0.59		0.25	0.74	0.13
Uniform Delay, d1	37.3	19.9		47.9	34.3		46.6	47.1		41.8	45.0	41.0
Progression Factor	1.00	1.00		0.76	1.47		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.0		6.9	2.9		1.6	2.2		0.5	10.0	0.3
Delay (s)	68.8	22.0		44.5	53.2		48.2	49.3		42.3	55.1	41.3
Level of Service	E	C		D	D		D	D		D	E	D
Approach Delay (s)		36.7			52.0			49.0			47.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	43.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1002: Ashby (SR 13) & San Pablo Avenue — Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3446		1770	3500		1770	3467	
Flt Permitted	0.20	1.00			0.69		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	370	3458			2363		1770	3500		1770	3467	
Volume (vph)	70	670	121	41	521	103	130	490	40	113	628	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	45	566	112	141	533	43	123	683	108
RTOR Reduction (vph)	0	16	0	0	18	0	0	5	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	707	0	141	571	0	123	782	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.4	34.4			34.4		13.2	46.6		16.0	49.4	
Effective Green, g (s)	34.4	34.4			34.4		13.2	47.6		16.0	50.4	
Actuated g/C Ratio	0.31	0.31			0.31		0.12	0.43		0.15	0.46	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	116	1081			745		212	1515		257	1589	
v/s Ratio Prot		0.24					c0.08	0.16		0.07	c0.23	
v/s Ratio Perm	0.21				c0.30							
v/c Ratio	0.66	0.78			0.95		0.67	0.38		0.48	0.49	
Uniform Delay, d1	32.7	34.4			36.9		46.3	21.2		43.2	20.8	
Progression Factor	0.54	0.59			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.9	2.9			21.0		7.6	0.7		1.4	1.1	
Delay (s)	27.6	23.1			58.0		53.9	21.9		44.6	21.9	
Level of Service	C	C			E		D	C		D	C	
Approach Delay (s)		23.5			58.0			28.2			25.0	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	32.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1003: 65th St & Christie Ave — Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	65	1	2	0	64	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	70	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	302	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	302	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	94	100	100	100
cM capacity (veh/h)	1542			1616			693	633	1079	585	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	72	1
Volume Left	0	84	2	0
Volume Right	2	1	70	0
cSH	1542	1616	1061	633
Volume to Capacity	0.00	0.05	0.07	0.00
Queue Length 95th (ft)	0	4	5	0
Control Delay (s)	0.0	4.4	8.6	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.6	10.7
Approach LOS			A	B

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	26.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	46	5	63	47	36	11	70	50	105	132	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	50	5	68	51	39	12	76	54	114	143	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	48	55	68	90	142	114	241
Volume Left (vph)	48	0	68	0	12	114	0
Volume Right (vph)	0	5	0	39	54	0	98
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.18	0.53	-0.25
Departure Headway (s)	6.6	6.0	6.5	5.7	5.5	6.0	5.2
Degree Utilization, x	0.09	0.09	0.12	0.14	0.22	0.19	0.35
Capacity (veh/h)	507	554	517	589	622	578	669
Control Delay (s)	9.0	8.4	9.2	8.4	10.0	9.2	9.7
Approach Delay (s)	8.7		8.8		10.0	9.5	
Approach LOS	A		A		B	A	

Intersection Summary				
Delay	9.4			
HCM Level of Service	A			
Intersection Capacity Utilization	33.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	201	0	0	146	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	218	0	0	159	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			218		377	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		377	218
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1351		624	821

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	218	159	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1351	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.92			0.99		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1815		1770	1850		1770	1837	
Flt Permitted		0.93			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1601			1462		1770	1850		1770	1837	
Volume (vph)	39	56	132	37	50	4	36	271	13	23	385	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	63	143	40	54	4	39	295	14	25	418	42
RTOR Reduction (vph)	0	98	0	0	3	0	0	3	0	0	6	0
Lane Group Flow (vph)	0	150	0	0	95	0	39	306	0	25	454	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		320			292		85	1003		32	941	
v/s Ratio Prot							c0.02	0.17		0.01	c0.25	
v/s Ratio Perm		c0.09			0.06							
v/c Ratio		0.47			0.32		0.46	0.31		0.78	0.48	
Uniform Delay, d1		17.7			17.1		23.2	6.3		24.5	7.9	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		0.8			0.5		2.8	0.8		72.6	1.8	
Delay (s)		18.4			17.6		23.6	8.4		97.1	9.7	
Level of Service		B			B		C	A		F	A	
Approach Delay (s)		18.4			17.6			10.1			14.2	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	14.1	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	50.2%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	63	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	68	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	128	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.10	0.00
Departure Headway (s)	4.2	4.6	4.1	4.3
Degree Utilization, x	0.01	0.11	0.15	0.11
Capacity (veh/h)	804	744	839	816
Control Delay (s)	7.3	8.1	7.9	7.8
Approach Delay (s)	7.3	8.1	7.9	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	19	17	125	170	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	21	18	136	185	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	375	202	220			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	375	202	220			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	96	99			
cM capacity (veh/h)	618	839	1350			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	46	18	136	220
Volume Left	25	18	0	0
Volume Right	21	0	0	35
cSH	701	1350	1700	1700
Volume to Capacity	0.07	0.01	0.08	0.13
Queue Length 95th (ft)	5	1	0	0
Control Delay (s)	10.5	7.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	10.5	0.9		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.96		1.00	0.85		1.00
Flt Protected	0.95		1.00	1.00		1.00
Satd. Flow (prot)	3403		3539	1583		3529
Flt Permitted	0.95		1.00	1.00		0.93
Satd. Flow (perm)	3403		3539	1583		3290
Volume (vph)	246	30	278	269	17	273
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	33	302	314	18	297
RTOR Reduction (vph)	10	0	0	170	0	0
Lane Group Flow (vph)	293	0	302	144	0	315
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1565		1628	728		1513
v/s Ratio Prot	c0.09		0.09			
v/s Ratio Perm				0.09		c0.10
v/c Ratio	0.19		0.19	0.20		0.21
Uniform Delay, d1	16.0		15.9	16.0		16.1
Progression Factor	0.61		0.13	1.90		1.00
Incremental Delay, d2	0.3		0.2	0.4		0.3
Delay (s)	10.0		2.2	30.9		16.4
Level of Service	A		A	C		B
Approach Delay (s)	10.0		16.9			18.4
Approach LOS	A		B			B

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	246	15	223	157	66	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	16	242	171	71	112
RTOR Reduction (vph)	0	11	0	0	0	91
Lane Group Flow (vph)	267	5	242	171	71	21
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.1	34.4	11.8	73.9	58.8	19.1
Effective Green, g (s)	18.6	33.9	11.3	73.4	58.1	18.6
Actuated g/C Ratio	0.19	0.34	0.11	0.73	0.58	0.19
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	329	537	388	1367	1082	294
v/s Ratio Prot	c0.15	0.00	c0.07	c0.09	0.04	0.01
v/s Ratio Perm						
v/c Ratio	0.81	0.01	0.62	0.13	0.07	0.07
Uniform Delay, d1	39.0	21.9	42.3	3.9	9.1	33.6
Progression Factor	1.11	2.98	0.73	0.20	1.00	1.00
Incremental Delay, d2	13.5	0.0	3.1	0.2	0.1	0.1
Delay (s)	56.8	65.3	33.8	1.0	9.2	33.7
Level of Service	E	E	C	A	A	C
Approach Delay (s)	57.3			20.2	24.2	
Approach LOS	E			C	C	

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1705		1770	3539	1583	1770	1794	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1705		1770	3539	1583	1770	1794	
Volume (vph)	5	21	16	570	79	0	88	36	806	60	218	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	620	86	0	96	39	659	65	238	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	23	1	344	362	0	96	39	659	65	304	0
Turn Type	Split			Perm	Split			Prot		Free	Prot	
Protected Phases	7	7		8	8		5	2			1	6
Permitted Phases				7						Free		
Actuated Green, G (s)	2.7	2.7	2.7	18.4	18.4		4.5	16.2	56.6	3.8	15.6	
Effective Green, g (s)	2.2	2.2	2.2	18.4	18.4		4.0	16.7	56.6	3.3	16.0	
Actuated g/C Ratio	0.04	0.04	0.04	0.33	0.33		0.07	0.30	1.00	0.06	0.28	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	69	72	62	546	554		125	1044	1583	103	507	
v/s Ratio Prot	0.00	0.01		0.20	c0.21		c0.05	0.01		0.04	c0.17	
v/s Ratio Perm				0.00					c0.42			
v/c Ratio	0.07	0.32	0.01	0.63	0.65		0.77	0.04	0.42	0.63	0.60	
Uniform Delay, d1	26.2	26.5	26.2	16.2	16.4		25.8	14.2	0.0	26.1	17.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.1	2.5		22.0	0.0	0.8	8.9	1.6	
Delay (s)	26.4	27.4	26.2	18.3	18.8		47.9	14.2	0.8	35.0	19.1	
Level of Service	C	C	C	B	B		D	B	A	C	B	
Approach Delay (s)		26.8			18.6			7.2			21.8	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	722	0	0	0	683	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	785	0	0	0	721	0	139
RTOR Reduction (vph)	0	68	0	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	129	373	0	0	739	785	0	0	0	721	0	35
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	67.0			44.0	100.0				24.5		24.5
Effective Green, g (s)	19.0	67.0			44.0	100.0				25.0		25.0
Actuated g/C Ratio	0.19	0.67			0.44	1.00				0.25		0.25
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2208			1492	1441				858		396
v/s Ratio Prot	0.07	0.11			0.22					c0.21		
v/s Ratio Perm						c0.54						0.02
v/c Ratio	0.38	0.17			0.50	0.54				0.84		0.09
Uniform Delay, d1	35.4	6.1			20.0	0.0				36.6		28.8
Progression Factor	1.00	1.00			0.85	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.0				7.3		0.1
Delay (s)	35.7	6.3			17.9	1.0				42.9		28.8
Level of Service	D	A			B	A				D		C
Approach Delay (s)		12.9			9.2			0.0		40.7		
Approach LOS		B			A			A		D		

Intersection Summary					
HCM Average Control Delay	19.1	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1464	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1464	1504			
Volume (vph)	74	806	0	0	813	291	589	2	1136	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	876	0	0	884	316	640	2	1234	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	215	0	97	51	0	0	0
Lane Group Flow (vph)	80	876	0	0	884	101	556	569	603	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	556	677			
v/s Ratio Prot	0.05	c0.17			c0.19		0.33	c0.39	c0.40			
v/s Ratio Perm						0.06						
v/c Ratio	0.25	0.37			0.60	0.20	0.87	1.02	0.89			
Uniform Delay, d1	35.2	17.0			28.6	24.7	28.7	31.0	25.3			
Progression Factor	0.53	0.54			0.47	0.24	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.4			1.5	0.8	12.6	44.4	14.2			
Delay (s)	20.3	9.6			15.0	6.6	41.3	75.4	39.5			
Level of Service	C	A			B	A	D	E	D			
Approach Delay (s)		10.5			12.9			52.0			0.0	
Approach LOS		B			B			D			A	

Intersection Summary					
HCM Average Control Delay	30.9	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1808	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1808	2628
Volume (vph)	517	1105	319	45	595	108	42	3	42	71	45	480
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	1201	347	49	647	117	46	3	46	77	49	522
RTOR Reduction (vph)	0	0	162	0	0	27	0	0	43	0	0	201
Lane Group Flow (vph)	562	1201	185	49	647	90	24	25	3	0	126	321
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	43.0	53.9	5.1	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	42.5	53.4	4.6	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.42	0.53	0.05	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1441	769	81	956	427	116	117	109		542	1317
v/s Ratio Prot	0.16	c0.35	c0.13	0.03	c0.18		0.01	0.01			0.07	c0.12
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.81	0.83	0.24	0.60	0.68	0.21	0.21	0.21	0.03		0.23	0.24
Uniform Delay, d1	38.2	25.6	12.5	46.8	32.6	28.3	44.0	44.0	43.4		26.3	14.2
Progression Factor	1.12	0.57	0.36	0.74	0.68	0.61	1.00	1.00	1.00		1.12	2.95
Incremental Delay, d2	7.3	4.1	0.1	7.4	3.3	1.0	0.6	0.7	0.1		1.0	0.4
Delay (s)	50.1	18.6	4.6	42.1	25.4	18.2	44.6	44.7	43.5		30.6	42.3
Level of Service	D	B	A	D	C	B	D	D	D		C	D
Approach Delay (s)		24.7			25.4			44.1			40.1	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM Average Control Delay	28.1	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.56				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3525			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3525			1863	
Volume (vph)	35	26	200	6	0	20	0	342	9	0	85	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	372	10	0	92	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	380	0	0	92	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	5		2					6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1502			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.11			0.05	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.25			0.14	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		16.5			22.8	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.53	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.4			0.5	
Delay (s)	17.0	17.0	14.7	47.7		47.0		16.9			35.5	
Level of Service	B	B	B	D		D		B			D	
Approach Delay (s)		15.2			47.1			18.9			35.5	
Approach LOS		B			D			B			D	

Intersection Summary					
HCM Average Control Delay	20.6	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.16				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3333		1770	3471		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3333		1770	3471		1770	1827		1770	1863	1583
Volume (vph)	355	341	216	34	403	60	230	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	371	235	37	438	65	250	188	28	28	153	101
RTOR Reduction (vph)	0	76	0	0	12	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	530	0	37	491	0	250	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	30.5	47.3		5.7	22.6		18.5	18.5		13.5	13.5	13.5
Effective Green, g (s)	30.0	47.8		5.2	23.0		18.0	18.0		13.0	13.0	13.0
Actuated g/C Ratio	0.30	0.48		0.05	0.23		0.18	0.18		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	531	1593		92	798		319	329		230	242	206
v/s Ratio Prot	c0.22	0.16		0.02	c0.14		c0.14	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.73	0.33		0.40	0.62		0.78	0.64		0.12	0.63	0.06
Uniform Delay, d1	31.3	16.2		45.9	34.5		39.1	38.0		38.5	41.2	38.2
Progression Factor	0.55	0.73		1.00	1.00		0.96	0.97		0.86	0.90	1.15
Incremental Delay, d2	3.2	0.4		2.9	3.5		11.9	4.0		0.2	5.2	0.1
Delay (s)	20.5	12.2		48.8	38.1		50.1	41.0		33.3	42.2	43.8
Level of Service	C	B		D	D		D	D		C	D	D
Approach Delay (s)		15.4			39.8			45.0			41.9	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3358		1770	3510		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3358		1770	3510		1770	3479		1770	3498	
Volume (vph)	68	172	89	89	381	22	103	447	57	40	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	187	97	97	414	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	77	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	207	0	97	433	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	14.1		9.0	16.7		11.4	54.7		7.2	50.5	
Effective Green, g (s)	5.4	14.6		8.0	17.2		10.4	55.2		6.2	51.0	
Actuated g/C Ratio	0.05	0.15		0.08	0.17		0.10	0.55		0.06	0.51	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	490		142	604		184	1920		110	1784	
v/s Ratio Prot	0.04	0.06		c0.05	c0.12		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.42		0.68	0.72		0.61	0.28		0.48	0.39	
Uniform Delay, d1	46.7	38.9		44.8	39.1		42.9	11.9		45.3	15.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.6		12.7	4.1		5.6	0.4		3.3	0.6	
Delay (s)	77.6	39.5		57.5	43.2		48.5	12.3		48.6	15.6	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		47.3			45.8			18.4			18.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3443		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3443		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	166	37	43	295	61	47	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	180	40	47	321	66	51	58	33	3	25	10
RTOR Reduction (vph)	0	11	0	0	0	27	0	25	0	0	9	0
Lane Group Flow (vph)	26	209	0	47	321	39	51	66	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	56.3		5.4	58.5	58.5	10.4	10.4			13.4	
Effective Green, g (s)	2.7	56.3		4.9	58.5	58.5	9.9	9.9			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.10	0.10			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1938		87	2070	926	175	174			231	
v/s Ratio Prot	0.01	0.06		c0.03	c0.09		0.03	c0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.11		0.54	0.16	0.04	0.29	0.38			0.13	
Uniform Delay, d1	48.0	10.2		46.4	9.5	8.8	41.8	42.2			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	0.7	1.0			0.2	
Delay (s)	57.6	10.3		51.8	9.6	8.9	42.5	43.2			38.7	
Level of Service	E	B		D	A	A	D	D			D	
Approach Delay (s)		15.3			14.1			42.9			38.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3434		1770	3539	1583	1770	1863	1583	1770	1841	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3434		1770	3539	1583	1770	1863	1583	1770	1841	
Volume (vph)	28	152	38	51	372	185	117	226	39	54	121	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	41	55	404	179	127	246	42	59	132	11
RTOR Reduction (vph)	0	17	0	0	0	89	0	0	34	0	3	0
Lane Group Flow (vph)	30	189	0	55	404	90	127	246	8	59	140	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	48.1		7.0	50.5	50.5	11.6	23.0	18.8	7.4	18.8	
Effective Green, g (s)	4.1	48.1		6.5	50.5	50.5	11.1	22.5	18.3	6.9	18.3	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.11	0.22	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1652		115	1787	799	198	419	290	122	337	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.07	c0.13		0.03	0.08	
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.41	0.11		0.48	0.23	0.11	0.65	0.59	0.03	0.48	0.41	
Uniform Delay, d1	46.8	14.3		45.1	13.8	13.0	42.6	34.8	33.5	44.8	36.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.07	0.92	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.3	6.4	1.7	0.0	2.2	0.6	
Delay (s)	49.5	14.4		47.4	14.1	13.3	48.9	36.3	33.6	50.0	33.9	
Level of Service	D	B		D	B	B	D	D	C	D	C	
Approach Delay (s)		18.8			16.6			39.9			38.8	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	203	16	90	562	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	221	17	98	611	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			328							
pX, platoon unblocked												
vC, conflicting volume	834			238			785	1111	119	1068	1108	317
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	634			238			785	1111	119	1068	1108	317
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			89	92	91	98	99	100
cM capacity (veh/h)	945			1326			268	187	910	140	186	679

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	147	91	98	407	226	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	945	1700	1700	1326	1700	1700	239	694	189
Volume to Capacity	0.03	0.09	0.05	0.07	0.24	0.13	0.15	0.13	0.03
Queue Length 95th (ft)	2	0	0	6	0	0	13	11	3
Control Delay (s)	8.9	0.0	0.0	7.9	0.0	0.0	22.6	10.9	24.7
Lane LOS	A			A			C	B	C
Approach Delay (s)	0.9			1.1			14.3		24.7
Approach LOS							B		C

Intersection Summary					
Average Delay	2.6				
Intersection Capacity Utilization	33.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3498		1770	3486			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3498		1770	3486			850	1583		1568	
Volume (vph)	3	249	21	60	477	53	85	66	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	271	23	65	518	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	5	0	0	6	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	289	0	75	570	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.49		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1725		122	1945			183	340		99	
v/s Ratio Prot	0.00	c0.08		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.17		0.61	0.29			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.0		45.3	11.7			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.04	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.3	0.3			38.9	0.1		1.5	
Delay (s)	77.5	14.2		53.3	7.3			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.6			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary					
HCM Average Control Delay	24.2	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.45				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	43.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3373		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3401		1770	3373		3433	3533		1770	3500	
Volume (vph)	92	203	72	29	301	137	238	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	221	78	32	327	149	259	776	9	147	736	59
RTOR Reduction (vph)	0	42	0	0	56	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	257	0	32	420	0	259	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	17.2		9.1	17.5		15.0	48.3		12.4	45.7	
Effective Green, g (s)	7.8	16.2		8.1	16.5		14.0	48.3		11.4	45.7	
Actuated g/C Ratio	0.08	0.16		0.08	0.16		0.14	0.48		0.11	0.46	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	551		143	557		481	1706		202	1600	
v/s Ratio Prot	c0.06	0.08		0.02	c0.12		0.08	c0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.22	0.75		0.54	0.46		0.73	0.49	
Uniform Delay, d1	45.1	38.0		43.0	39.8		40.0	17.2		42.8	19.0	
Progression Factor	1.27	1.26		1.17	1.17		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.8	0.5		0.3	5.0		0.8	0.9		10.5	1.1	
Delay (s)	72.0	48.4		50.6	51.6		40.8	18.1		53.3	20.1	
Level of Service	E	D		D	D		D	B		D	C	
Approach Delay (s)		54.3			51.6			23.7			25.3	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	33.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.57				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	59.6%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3488		1770	3485			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3488		1770	3485			3189			2945	
Volume (vph)	46	274	29	9	396	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	298	32	7	430	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	318	0	7	465	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2044		21	1917			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.13							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.24			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.8			16.3			19.3	
Progression Factor	0.61	1.46		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.2	7.1		27.9	6.1			16.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.9			8.5			16.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary					
HCM Average Control Delay	11.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.33				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	41.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↑			↑	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	99	50	2	8	67	26	2	1	2	16	4	73
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	54	2	9	73	28	2	1	2	17	4	79

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	108	57	110	5	101
Volume Left (vph)	108	0	9	2	17
Volume Right (vph)	0	2	28	2	79
Hadj (s)	0.53	0.01	0.10	0.13	0.40
Departure Headway (s)	5.4	4.6	4.3	4.5	4.2
Degree Utilization, x	0.16	0.08	0.13	0.01	0.12
Capacity (veh/h)	657	722	797	736	808
Control Delay (s)	8.2	7.0	8.0	7.6	7.7
Approach Delay (s)	7.8		8.0	7.6	7.7
Approach LOS	A		A	A	A

Intersection Summary			
Delay	7.8		
HCM Level of Service	A		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑	↱		↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			8			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.6	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.16	0.16			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	45.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3504			3478	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3504			3478	
Volume (vph)	51	103	9	77	117	20	0	877	82	0	692	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	953	67	0	752	98
RTOR Reduction (vph)	0	4	0	0	6	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1016	0	0	843	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2295	
v/s Ratio Prot					c0.07			c0.29			0.24	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.44			0.37	
Uniform Delay, d1		44.2			44.1			8.5			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.2			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.2			8.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↱		↑↑			↑↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95			0.95	1.00		0.95			0.91	
Frt		1.00			1.00	0.85		1.00			1.00	
Flt Protected		0.99			0.99	1.00		1.00			1.00	
Satd. Flow (prot)		3508			3508	1583		3534			5073	
Flt Permitted		0.99			0.99	1.00		0.93			1.00	
Satd. Flow (perm)		3508			3508	1583		3293			5073	
Volume (vph)	0	0	0	65	296	663	12	433	0	0	676	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	471	0	0	735	12
RTOR Reduction (vph)	0	0	0	0	0	245	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	476	0	484	0	0	745	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					31.9	31.9		59.1			59.1	
Effective Green, g (s)					31.9	31.9		60.1			60.1	
Actuated g/C Ratio					0.32	0.32		0.60			0.60	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1119	505		1979			3049	
v/s Ratio Prot					0.11						0.15	
v/s Ratio Perm						c0.30		c0.15				
v/c Ratio					0.35	0.94		0.24			0.24	
Uniform Delay, d1					26.1	33.2		9.3			9.3	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	26.0		0.3			0.2	
Delay (s)					26.2	59.1		9.6			9.5	
Level of Service					C	E		A			A	
Approach Delay (s)		0.0			47.6			9.6			9.5	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑		↑↑	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3479		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3479		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	427	54	221	486	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	464	59	240	530	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	515	0	240	530	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.9						39.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						2.0		2.0	2.0	
Lane Grp Cap (vph)		429						1943		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.26		0.48	0.20	
Uniform Delay, d1		28.4						8.0		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.3	0.0	
Delay (s)		28.7						8.3		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.3			10.3	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰	↑↑		↰	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3445		1770	3504		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3445		1770	3504		1770	3421		1770	1863	1583
Volume (vph)	283	614	132	105	745	52	173	404	116	130	254	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	143	114	810	57	188	439	126	141	276	501
RTOR Reduction (vph)	0	15	0	0	4	0	0	24	0	0	0	317
Lane Group Flow (vph)	286	795	0	114	863	0	188	541	0	141	276	184
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	42.4		11.5	33.6		19.4	19.4		19.7	19.7	19.7
Effective Green, g (s)	20.4	43.4		11.5	34.5		19.4	19.4		19.7	19.7	19.7
Actuated g/C Ratio	0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1359		185	1099		312	603		317	334	284
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.11	c0.16		0.08	c0.15	
v/s Ratio Perm												0.12
v/c Ratio	0.87	0.58		0.62	0.79		0.60	0.90		0.44	0.83	0.65
Uniform Delay, d1	43.5	26.2		47.1	34.4		41.7	44.3		40.3	43.5	41.9
Progression Factor	1.00	1.00		1.34	0.66		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	1.8		4.7	4.5		2.4	14.0		1.0	15.3	5.0
Delay (s)	65.1	28.1		68.0	27.2		43.7	58.2		41.3	58.8	47.0
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		37.7			31.9			54.6			49.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑			↑↑		↰	↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3437		1770	3497		1770	3470	
Flt Permitted	0.14	1.00			0.83		0.95	1.00		0.85	1.00	
Satd. Flow (perm)	255	3426			2862		1770	3497		1770	3470	
Volume (vph)	96	580	159	22	608	142	172	898	76	181	775	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	630	173	24	661	154	187	976	85	197	842	127
RTOR Reduction (vph)	0	27	0	0	21	0	0	5	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	818	0	187	1056	0	197	960	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	34.6	34.6			34.6		15.2	47.4		15.0	47.2	
Effective Green, g (s)	34.6	34.6			34.6		15.2	48.4		15.0	48.2	
Actuated g/C Ratio	0.31	0.31			0.31		0.14	0.44		0.14	0.44	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	80	1078			900		245	1539		241	1520	
v/s Ratio Prot		0.23					c0.11	c0.30		c0.11	0.28	
v/s Ratio Perm	c0.41				0.29							
v/c Ratio	1.30	0.73			0.91		0.76	0.69		0.82	0.63	
Uniform Delay, d1	37.7	33.5			36.2		45.7	24.7		46.2	24.0	
Progression Factor	1.05	1.06			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	190.5	2.0			12.8		13.2	2.5		18.9	2.0	
Delay (s)	230.2	37.4			46.9		58.8	27.2		65.1	26.0	
Level of Service	F	D			D		E	C		E	C	
Approach Delay (s)		59.3			46.9			32.0			32.6	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM Average Control Delay	41.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	140	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	152	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	459	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	459	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	86	100	100	100
cM capacity (veh/h)	1598			1595			803	556	1057	410	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	155	2
Volume Left	1	133	2	1
Volume Right	0	0	152	0
cSH	1598	1595	1039	472
Volume to Capacity	0.00	0.08	0.15	0.00
Queue Length 95th (ft)	0	7	13	0
Control Delay (s)	0.4	6.6	9.1	12.7
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.1	12.7
Approach LOS			A	B

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	20.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	101	78	6	136	85	106	10	396	227	16	163	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	85	7	148	92	115	11	430	247	17	177	72
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2					
Volume Total (vph)	110	91	148	208	688	17	249					
Volume Left (vph)	110	0	148	0	11	17	0					
Volume Right (vph)	0	7	0	115	247	0	72					
Hadj (s)	0.53	0.02	0.53	-0.35	-0.18	0.53	-0.17					
Departure Headway (s)	8.4	7.9	8.1	7.2	6.7	8.0	7.3					
Degree Utilization, x	0.26	0.20	0.33	0.42	1.28	0.04	0.50					
Capacity (veh/h)	409	437	430	484	546	436	471					
Control Delay (s)	13.1	11.7	13.9	14.1	160.7	10.1	16.2					
Approach Delay (s)	12.5		14.0		160.7	15.8						
Approach LOS	B		B		F	C						
Intersection Summary												
Delay			80.9									
HCM Level of Service			F									
Intersection Capacity Utilization			69.7%		ICU Level of Service				C			
Analysis Period (min)			15									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	321	0	0	327	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	349	0	0	355	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			349		704	349
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			349		704	349
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1210		403	694
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	349	355	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1210	1700			
Volume to Capacity	0.21	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			20.5%	ICU Level of Service		A
Analysis Period (min)			15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1760			1793		1770	1843		1770	1757	
Flt Permitted		0.92			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1477			1577		1770	1843		1770	1757	
Volume (vph)	138	163	88	36	87	20	163	804	39	19	317	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	186	74	39	95	22	177	667	42	21	345	130
RTOR Reduction (vph)	0	16	0	0	11	0	0	4	0	0	25	0
Lane Group Flow (vph)	0	374	0	0	145	0	177	695	0	21	450	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.4			16.4		7.4	25.7		1.4	19.7	
Effective Green, g (s)		15.9			15.9		6.9	26.2		0.9	20.2	
Actuated g/C Ratio		0.29			0.29		0.13	0.48		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		427			456		222	878		29	645	
v/s Ratio Prot							c0.10	c0.38		0.01	0.26	
v/s Ratio Perm		c0.25			0.09							
v/c Ratio		0.88			0.32		0.80	0.79		0.72	0.70	
Uniform Delay, d1		18.6			15.3		23.4	12.1		26.9	14.8	
Progression Factor		1.00			1.00		0.90	1.04		0.88	1.06	
Incremental Delay, d2		17.8			0.3		14.6	6.1		53.6	6.5	
Delay (s)		36.4			15.6		35.7	18.7		80.0	21.2	
Level of Service		D			B		D	B		F	C	
Approach Delay (s)		36.4			15.6			22.1			23.7	
Approach LOS		D			B			C			C	
Intersection Summary												
HCM Average Control Delay			24.9		HCM Level of Service			C				
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)			8.0				
Intersection Capacity Utilization			74.1%		ICU Level of Service			D				
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	144	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	157	72	5	128	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	84	68	247	135								
Volume Left (vph)	4	57	18	5								
Volume Right (vph)	64	12	72	1								
Hadj (s)	-0.42	0.09	-0.13	0.04								
Departure Headway (s)	4.4	5.0	4.3	4.6								
Degree Utilization, x	0.10	0.09	0.30	0.17								
Capacity (veh/h)	734	661	803	743								
Control Delay (s)	8.0	8.5	9.1	8.5								
Approach Delay (s)	8.0	8.5	9.1	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
HCM Level of Service			A									
Intersection Capacity Utilization			35.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	54	34	18	570	271	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	37	20	620	295	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	974	315	336			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	974	315	336			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	95	98			
cM capacity (veh/h)	276	729	1223			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	96	20	620	336
Volume Left	59	20	0	0
Volume Right	37	0	0	41
cSH	362	1223	1700	1700
Volume to Capacity	0.26	0.02	0.36	0.20
Queue Length 95th (ft)	26	1	0	0
Control Delay (s)	18.0	8.0	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.5	0.2	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3397		3539	1488		3526
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3397		3539	1488		3245
Volume (vph)	727	57	386	167	24	437
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	790	62	420	182	26	475
RTOR Reduction (vph)	5	0	0	99	0	0
Lane Group Flow (vph)	847	0	420	83	0	501
Confl. Peds. (#/hr)			26	19	19	
Confl. Bikes (#/hr)			2	3		
Turn Type				Perm	Perm	
Protected Phases	4		2		6	
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1606		1609	676		1475
v/s Ratio Prot	c0.25		0.12			
v/s Ratio Perm				0.06		c0.15
v/c Ratio	0.53		0.26	0.12		0.34
Uniform Delay, d1	20.4		18.6	17.3		19.4
Progression Factor	0.59		0.14	0.00		1.00
Incremental Delay, d2	1.1		0.3	0.3		0.6
Delay (s)	13.1		2.9	0.3		20.0
Level of Service	B		A	A		B
Approach Delay (s)	13.1		2.1			20.0
Approach LOS	B		A			B

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	160	34	472	608	197	312
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	37	513	659	214	339
RTOR Reduction (vph)	0	21	0	0	0	206
Lane Group Flow (vph)	163	16	513	659	214	133
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	15.6	47.3	28.2	87.4	55.7	15.6
Effective Green, g (s)	15.1	46.8	27.7	86.9	55.2	15.1
Actuated g/C Ratio	0.14	0.43	0.25	0.79	0.50	0.14
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	673	864	1472	935	217
v/s Ratio Prot	c0.09	0.01	c0.15	c0.35	0.11	0.08
v/s Ratio Perm						
v/c Ratio	0.67	0.02	0.59	0.45	0.23	0.61
Uniform Delay, d1	45.1	18.3	36.2	3.8	15.4	44.7
Progression Factor	0.52	0.04	0.79	0.27	1.00	1.00
Incremental Delay, d2	7.0	0.0	0.9	0.8	0.6	5.0
Delay (s)	30.5	0.8	29.5	1.8	16.0	49.7
Level of Service	C	A	C	A	B	D
Approach Delay (s)	25.0		14.0		35.7	
Approach LOS	C		B		D	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1625	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Volume (vph)	172	370	60	423	14	0	11	641	1179	252	518	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	460	15	0	12	697	1282	274	563	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	231	244	0	12	697	1282	274	611	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split			Perm	Split			Prot		Free	Prot	
Protected Phases	7	7		8	8		5	2			1	6
Permitted Phases				7						Free		
Actuated Green, G (s)	16.5	16.5	16.5	16.5	16.5		1.1	22.7	87.5	16.3	37.9	
Effective Green, g (s)	16.0	16.0	16.0	16.5	16.5		0.6	23.2	87.5	15.8	38.4	
Actuated g/C Ratio	0.18	0.18	0.18	0.19	0.19		0.01	0.27	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	324	341	289	317	319		12	938	1583	320	801	
v/s Ratio Prot	0.11	c0.22		0.14	0.14		0.01	0.20		0.15	0.33	
v/s Ratio Perm			0.03						c0.81			
v/c Ratio	0.58	1.18	0.17	0.73	0.76		1.00	0.74	0.81	0.86	0.76	
Uniform Delay, d1	32.7	35.8	30.1	33.4	33.7		43.4	29.4	0.0	34.7	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	106.7	0.1	7.6	10.0		259.8	3.0	4.6	18.9	4.2	
Delay (s)	34.2	142.5	30.2	41.0	43.7		303.3	32.5	4.6	53.7	24.9	
Level of Service	C	F	C	D	D		F	C	A	D	C	
Approach Delay (s)		100.4			42.4			16.2			33.8	
Approach LOS		F			D			B			C	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	4.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			2991	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			2991	1399				3433		1583
Volume (vph)	140	394	572	0	521	1562	0	0	0	714	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	1730	0	0	0	776	0	359
RTOR Reduction (vph)	0	205	0	0	160	0	0	0	0	0	0	262
Lane Group Flow (vph)	152	845	0	0	1017	1119	0	0	0	776	0	97
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	72.4			48.4	110.0				29.1		29.1
Effective Green, g (s)	20.0	72.4			48.4	110.0				29.6		29.6
Actuated g/C Ratio	0.18	0.66			0.44	1.00				0.27		0.27
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2123			1316	1399				924		426
v/s Ratio Prot	0.09	0.26			0.34					0.23		0.06
v/s Ratio Perm						c0.80						
v/c Ratio	0.47	0.40			0.77	0.80				0.84		0.23
Uniform Delay, d1	40.3	8.7			26.1	0.0				38.0		31.3
Progression Factor	1.00	1.00			0.60	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			0.4	0.5				8.7		0.2
Delay (s)	40.7	9.3			16.1	0.5				44.6		31.5
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.2			8.5			0.0		40.5		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	17.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1527	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1527	659			
Volume (vph)	141	967	0	0	1563	459	550	226	880	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1051	0	0	1699	499	598	246	957	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	64	18	0	0	0
Lane Group Flow (vph)	153	1051	0	0	1699	236	598	660	461	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot						Perm	Split		custom		
Protected Phases	5	2			6			4	4	4 1		
Permitted Phases							6					
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	514	335			
v/s Ratio Prot	0.09	c0.30			c0.37		0.36	0.43	c0.70			
v/s Ratio Perm						0.18						
v/c Ratio	0.45	0.71			1.01	0.48	1.06	1.28	1.38			
Uniform Delay, d1	39.4	26.4			35.0	27.0	36.5	36.5	27.0			
Progression Factor	1.55	0.39			0.95	1.30	1.00	1.00	1.00			
Incremental Delay, d2	3.5	2.3			18.4	2.0	54.3	142.3	186.6			
Delay (s)	64.6	12.5			51.7	37.0	90.8	178.8	213.8			
Level of Service	E	B			D	D	F	F	F			
Approach Delay (s)		19.1			48.4			158.9			0.0	
Approach LOS		B			D			F			A	

Intersection Summary				
HCM Average Control Delay	79.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.22			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1812	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1812	2628
Volume (vph)	411	765	671	259	969	163	132	16	66	206	163	786
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	447	832	729	282	1075	177	143	17	72	224	177	854
RTOR Reduction (vph)	0	7	140	0	0	22	0	0	63	0	0	85
Lane Group Flow (vph)	447	918	496	282	1075	155	78	62	9	0	401	769
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.6	33.5	51.0	17.5	32.5	32.5	14.5	14.5	14.5		30.5	46.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	0.13	0.28	c0.41	0.16	c0.30		0.05	0.05			c0.22	0.29
v/s Ratio Perm						0.10			0.01			
v/c Ratio	0.84	0.92	0.88	1.03	1.01	0.33	0.36	0.28	0.05		0.81	0.68
Uniform Delay, d1	45.2	37.2	26.7	48.5	38.5	29.9	43.9	44.0	42.1		37.4	25.5
Progression Factor	1.24	0.99	0.97	1.00	1.00	1.00	1.02	1.02	2.14		0.64	0.24
Incremental Delay, d2	4.1	4.5	4.1	62.1	30.7	1.8	0.7	0.8	0.1		12.4	3.1
Delay (s)	60.3	40.1	30.0	106.6	69.2	31.7	45.7	45.8	90.1		36.3	9.3
Level of Service	E	D	C	F	E	C	D	D	F		D	A
Approach Delay (s)		41.4			72.1			59.5			17.9	
Approach LOS		D			E			E			B	

Intersection Summary				
HCM Average Control Delay	45.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	907	25	0	231	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	986	27	0	251	0
RTOR Reduction (vph)	0	0	414	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	359	51	0	7	0	1011	0	0	251	0
Confl. Peds. (#/hr)			21			1			10			16
Confl. Bikes (#/hr)									3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3		3		2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.0	6.0		6.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.13	c0.03				c0.29			0.13	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.28	0.42		0.07		0.63			0.38	
Uniform Delay, d1	29.1	23.0	19.1	49.2		48.0		23.0			26.2	
Progression Factor	1.23	1.22	3.47	1.00		1.00		1.00			1.49	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		1.9			1.6	
Delay (s)	36.8	28.3	66.9	50.9		48.2		24.0			40.5	
Level of Service	C	C	E	D		D		C			D	
Approach Delay (s)		54.9			49.1			24.9			40.5	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM Average Control Delay	40.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3423		1770	3466		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3423		1770	3466		1770	1843		1770	1863	1537
Volume (vph)	169	688	136	20	560	55	477	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	748	148	22	609	60	518	455	29	63	215	170
RTOR Reduction (vph)	0	14	0	0	7	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	882	0	22	662	0	518	402	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			6			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.8	30.8		2.6	22.5		45.6	45.6		16.0	16.0	16.0
Effective Green, g (s)	10.4	31.3		2.1	23.0		45.1	45.1		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	167	974		34	725		728	756		249	263	217
v/s Ratio Prot	c0.10	c0.26		0.01	c0.19		c0.29	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.10	0.91		0.65	0.91		0.71	0.64		0.25	0.82	0.11
Uniform Delay, d1	49.8	37.9		53.6	42.5		27.1	25.9		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.99	1.00		1.07	1.04	1.76
Incremental Delay, d2	99.5	13.4		35.3	17.9		3.3	1.8		0.5	16.7	0.2
Delay (s)	149.3	51.3		88.8	60.4		30.0	27.6		45.6	64.3	72.9
Level of Service	F	D		F	E		C	C		D	E	E
Approach Delay (s)		68.0			61.3			28.8			64.9	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	54.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3410		1770	3464		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3410		1770	3464		1770	3483		1770	3483	
Volume (vph)	128	578	186	100	365	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	628	202	109	397	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	35	0	0	16	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	795	0	109	447	0	152	1179	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.2		8.4	22.2		11.8	32.4		10.0	30.5	
Effective Green, g (s)	9.4	24.7		7.4	22.7		10.9	32.9		9.0	31.0	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.12	0.37		0.10	0.34	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	936		146	874		214	1273		177	1200	
v/s Ratio Prot	c0.08	c0.23		0.06	0.13		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.85		0.75	0.51		0.71	0.93		0.69	0.87	
Uniform Delay, d1	39.2	30.9		40.4	28.9		38.0	27.4		39.1	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	7.3		18.8	0.5		10.6	12.8		10.6	8.7	
Delay (s)	54.9	38.2		59.0	29.4		48.6	40.2		49.8	36.3	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		40.8			35.0			41.2			37.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3397		1770	3539	1524	1770	1684			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3397		1770	3539	1524	1770	1684			1805	
Volume (vph)	24	588	177	80	569	27	182	106	108	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	639	192	87	640	29	198	115	117	46	115	21
RTOR Reduction (vph)	0	20	0	0	0	15	0	42	0	0	5	0
Lane Group Flow (vph)	26	811	0	87	640	15	198	190	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	45.3		7.9	50.0	50.0	16.6	16.6			15.7	
Effective Green, g (s)	2.7	45.3		7.4	50.0	50.0	16.1	16.1			15.2	
Actuated g/C Ratio	0.03	0.45		0.07	0.50	0.50	0.16	0.16			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1539		131	1770	762	285	271			274	
v/s Ratio Prot	0.01	c0.24		c0.05	0.18		0.11	c0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.53		0.66	0.36	0.02	0.69	0.70			0.65	
Uniform Delay, d1	48.0	19.6		45.1	15.3	12.5	39.6	39.7			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.3		10.8	0.6	0.0	6.6	7.4			4.6	
Delay (s)	57.5	20.9		55.9	15.8	12.7	46.2	47.1			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		22.1			20.3			46.7			44.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3425		1770	3539	1496	1770	1863	1520	1770	1812	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3425		1770	3539	1496	1770	1863	1520	1770	1812	
Volume (vph)	46	644	116	141	498	153	181	273	115	165	306	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.82	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	126	153	541	166	197	297	125	179	333	55
RTOR Reduction (vph)	0	16	0	0	0	96	0	0	95	0	6	0
Lane Group Flow (vph)	50	701	0	153	541	70	197	297	30	179	382	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	39.8		12.2	42.3	42.3	12.5	24.4	24.4	12.1	24.0	
Effective Green, g (s)	6.2	36.8		11.7	42.3	42.3	12.0	23.9	23.9	11.6	23.5	
Actuated g/C Ratio	0.06	0.37		0.12	0.42	0.42	0.12	0.24	0.24	0.12	0.24	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1260		207	1497	633	212	445	363	205	426	
v/s Ratio Prot	0.03	c0.20		c0.09	0.15		c0.11	0.16		0.10	c0.21	
v/s Ratio Perm						0.05			0.02			
v/c Ratio	0.45	0.56		0.74	0.36	0.11	0.93	0.67	0.08	0.87	0.90	
Uniform Delay, d1	45.3	25.1		42.7	19.7	17.5	43.6	34.5	29.5	43.5	37.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.96	
Incremental Delay, d2	2.2	1.8		12.2	0.7	0.4	42.0	3.4	0.1	29.8	20.1	
Delay (s)	47.4	26.9		54.9	20.3	17.8	85.5	37.8	29.6	72.0	55.6	
Level of Service	D	C		D	C	B	F	D	C	E	E	
Approach Delay (s)		28.2			26.0			51.4			60.9	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	748	44	96	785	12	33	12	98	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	813	48	104	853	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	866			861			1534	1960	430	1636	1977	433
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	866			861			1534	1960	430	1636	1977	433
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			87			40	75	81	100	83	98
cM capacity (veh/h)	773			777			60	53	673	39	51	571

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	542	319	104	569	297	42	113	19
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	773	1700	1700	777	1700	1700	59	365	99
Volume to Capacity	0.03	0.32	0.19	0.13	0.33	0.17	0.72	0.31	0.19
Queue Length 95th (ft)	2	0	0	12	0	0	78	32	16
Control Delay (s)	9.8	0.0	0.0	10.4	0.0	0.0	159.1	19.2	49.5
Lane LOS	A			B			F	C	E
Approach Delay (s)	0.3			1.1			57.4		49.5
Approach LOS							F		E

Intersection Summary					
Average Delay	5.5				
Intersection Capacity Utilization	45.0%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3449		1770	3479			1806	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3449		1770	3479			1806	1555		1811	
Volume (vph)	30	756	101	124	706	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	822	110	135	767	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	924	0	135	824	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			8						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	37.6		11.3	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.6		10.8	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.08	0.36		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1297		191	1399			380	327		284	
v/s Ratio Prot	0.02	c0.27		c0.08	0.24			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.71		0.71	0.59			0.86	0.22		0.71	
Uniform Delay, d1	42.9	26.6		43.1	23.4			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.18	0.82			1.00	1.00		1.00	
Incremental Delay, d2	0.6	3.3		4.3	0.7			17.8	0.3		7.8	
Delay (s)	43.6	29.9		55.4	19.2			55.9	33.0		48.4	
Level of Service	D	C		E	B			E	C		D	
Approach Delay (s)		30.4			20.8			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM Average Control Delay	31.6	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	76.1%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3296		1770	3368		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3296		1770	3368		3433	3529		1770	3467	
Volume (vph)	205	526	290	48	386	146	405	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	572	315	50	418	159	440	1035	16	241	1052	111
RTOR Reduction (vph)	0	74	0	0	40	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	813	0	50	537	0	440	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	16.6	26.4		6.7	16.6		14.0	37.6		15.3	38.9	
Effective Green, g (s)	14.5	27.4		4.7	17.6		13.0	37.6		14.3	38.9	
Actuated g/C Ratio	0.14	0.27		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	903		83	593		446	1327		253	1349	
v/s Ratio Prot	c0.13	c0.25		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.87	0.90		0.60	0.90		0.99	0.79		0.95	0.86	
Uniform Delay, d1	41.8	35.0		46.7	40.4		43.4	27.7		42.5	28.0	
Progression Factor	0.63	0.78		1.03	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.6	9.5		7.9	16.4		38.8	4.9		43.1	7.2	
Delay (s)	45.8	36.8		56.2	53.7		82.1	32.6		85.6	35.1	
Level of Service	D	D		E	D		F	C		F	D	
Approach Delay (s)		38.6			53.8			47.2			43.8	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	45.0	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	83.1%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3438			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3438			3156			2746	
Volume (vph)	16	846	16	9	447	89	19	212	23	75	186	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	702	17	10	486	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	24	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	716	0	10	559	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot					Perm		Perm	
Protected Phases	1	6		5	2			4			8	
Permitted Phases									4			
Actuated Green, G (s)	1.2	28.7		1.1	28.6			8.2			8.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1967			549			478	
v/s Ratio Prot	c0.01	c0.20		0.01	0.16							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.35		0.48	0.28			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.29		1.00	1.00			1.00			1.00	
Incremental Delay, d2	20.8	0.2		6.1	0.4			0.6			1.9	
Delay (s)	45.3	7.2		30.6	5.8			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.1			6.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary					
HCM Average Control Delay	11.5	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	271	75	11	86	78	46	19	83	50	65	59	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	295	82	12	93	85	50	21	90	54	71	64	201
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	295	93	228	165	336							
Volume Left (vph)	295	0	93	21	71							
Volume Right (vph)	0	12	50	54	201							
Hadj (s)	0.53	0.06	0.02	0.14	0.28							
Departure Headway (s)	7.1	6.5	6.4	6.4	5.9							
Degree Utilization, x	0.58	0.17	0.41	0.30	0.55							
Capacity (veh/h)	488	528	505	469	571							
Control Delay (s)	16.0	9.5	13.7	12.1	15.8							
Approach Delay (s)	16.0		13.7	12.1	15.8							
Approach LOS	C		B	B	C							
Intersection Summary												
Delay			14.9									
HCM Level of Service			B									
Intersection Capacity Utilization			66.0%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM Average Control Delay			11.1		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			46.9		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			51.1%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3509			3500	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3509			3500	
Volume (vph)	73	162	14	96	123	36	0	1108	66	0	1214	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1204	72	0	1320	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1273	0	0	1419	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2160	
v/s Ratio Prot					c0.08			0.36			c0.41	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.59			0.66	
Uniform Delay, d1		42.7			43.5			12.1			12.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.6	
Delay (s)		46.7			45.4			13.2			14.5	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.2			14.5	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay			19.3		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			61.0%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3183			5073	
Volume (vph)	0	0	0	64	237	549	19	813	0	0	1201	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	884	0	0	1305	22
RTOR Reduction (vph)	0	0	0	0	0	114	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	483	0	905	0	0	1325	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1945			3100	
v/s Ratio Prot					0.09						0.26	
v/s Ratio Perm						c0.30		c0.28				
v/c Ratio					0.31	1.02		0.47			0.43	
Uniform Delay, d1					24.3	31.5		9.5			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	45.5		0.8			0.4	
Delay (s)					24.4	77.0		10.3			9.6	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			58.4			10.3			9.6	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM Average Control Delay			24.1		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			63.7%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3491		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3491		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	760	78	592	709	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	848	85	643	771	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	927	0	643	771	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	78.2	
Effective Green, g (s)		23.8						49.1		25.1	78.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1558		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.22	
v/s Ratio Perm												
v/c Ratio		0.82						0.59		0.82	0.31	
Uniform Delay, d1		41.1						23.0		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.7		6.6	0.0	
Delay (s)		48.0						24.6		46.9	5.9	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.6			24.6	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	124	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	135	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	337	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			208	201	13	337	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	87	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	515	658	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	138	12
Volume Left	0	87	0	1
Volume Right	0	1	135	3
cSH	1604	1605	1052	714
Volume to Capacity	0.00	0.06	0.13	0.02
Queue Length 95th (ft)	0	4	11	1
Control Delay (s)	0.0	6.4	8.9	10.1
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	8.9	10.1
Approach LOS			A	B

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	26.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	35	13	112	42	20	13	339	216	17	238	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	38	14	122	46	22	14	368	235	18	259	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	76	52	122	67	617	18	301
Volume Left (vph)	76	0	122	0	14	18	0
Volume Right (vph)	0	14	0	22	235	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.19	0.53	-0.06
Departure Headway (s)	8.1	7.4	7.9	7.2	6.0	7.1	6.5
Degree Utilization, x	0.17	0.11	0.27	0.14	1.03	0.04	0.54
Capacity (veh/h)	423	460	434	476	604	495	545
Control Delay (s)	11.6	10.1	12.6	10.2	68.9	9.1	15.7
Approach Delay (s)	11.0		11.8		68.9	15.3	
Approach LOS	B		B		F	C	

Intersection Summary			
Delay	40.7		
HCM Level of Service	E		
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

Existing Plus Alt#2 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	17	0	0	20	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	0	0	22	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			18		40	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			18		40	18
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1598		971	1060

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	18	22	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1598	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave — Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	108	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	117	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	192	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	-0.49	0.00	-0.18	0.04
Departure Headway (s)	4.0	4.5	4.0	4.3
Degree Utilization, x	0.02	0.08	0.21	0.06
Capacity (veh/h)	828	751	878	799
Control Delay (s)	7.1	7.9	8.1	7.7
Approach Delay (s)	7.1	7.9	8.1	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St — Existing Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	45	23	12	566	332	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	25	13	615	361	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1024	383	404			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1024	383	404			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	96	99			
cM capacity (veh/h)	258	665	1154			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	74	13	615	404
Volume Left	49	13	0	0
Volume Right	25	0	0	43
cSH	325	1154	1700	1700
Volume to Capacity	0.23	0.01	0.36	0.24
Queue Length 95th (ft)	21	1	0	0
Control Delay (s)	19.3	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	19.3	0.2	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave — Existing Plus Alt#2 SAT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.96
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.95		1.00	1.00		1.00
Satd. Flow (prot)	3386		3539	1492		3524
Flt Permitted	0.95		1.00	1.00		0.91
Satd. Flow (perm)	3386		3539	1492		3227
Volume (vph)	786	76	332	318	26	371
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	854	83	361	346	28	403
RTOR Reduction (vph)	7	0	0	201	0	0
Lane Group Flow (vph)	930	0	361	145	0	431
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.51		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1724		1460	624		1349
v/s Ratio Prot	c0.27		0.10			
v/s Ratio Perm				0.10		c0.13
v/c Ratio	0.54		0.24	0.23		0.32
Uniform Delay, d1	18.3		20.7	20.6		21.5
Progression Factor	0.37		0.60	2.56		1.00
Incremental Delay, d2	1.1		0.3	0.6		0.6
Delay (s)	7.9		12.6	53.8		22.1
Level of Service	A		B	D		C
Approach Delay (s)	7.9		32.8			22.1
Approach LOS	A		C			C

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St — Existing Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	277	51	860	795	225	218
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	301	55	717	864	245	237
RTOR Reduction (vph)	0	26	0	0	0	24
Lane Group Flow (vph)	301	29	717	864	245	213
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	24.0	59.0	31.5	79.0	44.0	71.5
Effective Green, g (s)	23.5	58.5	31.0	78.5	43.5	71.0
Actuated g/C Ratio	0.21	0.53	0.28	0.71	0.40	0.65
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	378	842	967	1330	737	1022
v/s Ratio Prot	c0.17	0.02	c0.21	c0.46	0.13	0.13
v/s Ratio Perm						
v/c Ratio	0.80	0.03	0.74	0.65	0.33	0.21
Uniform Delay, d1	41.0	12.3	35.9	8.4	23.1	8.0
Progression Factor	0.96	0.02	0.39	1.29	1.00	1.00
Incremental Delay, d2	10.3	0.0	2.0	1.6	1.2	0.1
Delay (s)	25.1	0.2	16.1	12.5	24.4	8.1
Level of Service	C	A	B	B	C	A
Approach Delay (s)	21.2		14.1		16.4	
Approach LOS	C		B		B	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Volume (vph)	26	21	7	693	13	16	41	246	836	120	393	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	753	14	17	45	267	909	130	427	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	306	385	0	45	267	909	130	458	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	21.5	21.5		3.6	17.3	65.0	7.6	21.3	
Effective Green, g (s)	2.6	2.6	2.6	21.5	21.5		3.1	17.8	65.0	7.1	21.8	
Actuated g/C Ratio	0.04	0.04	0.04	0.33	0.33		0.05	0.27	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	75	63	556	556		84	969	1583	193	615	
v/s Ratio Prot	0.02	0.01		c0.24	0.23		0.03	0.08		0.07	c0.25	
v/s Ratio Perm			0.00						c0.57			
v/c Ratio	0.39	0.31	0.01	0.72	0.69		0.54	0.28	0.57	0.67	0.75	
Uniform Delay, d1	30.4	30.3	30.0	19.1	18.9		30.2	18.5	0.0	27.8	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.1	3.4		3.3	0.1	1.5	7.1	4.6	
Delay (s)	31.7	31.2	30.0	23.1	22.3		33.6	18.6	1.5	34.9	23.8	
Level of Service	C	C	C	C	C		C	B	A	C	C	
Approach Delay (s)		31.3			22.7			6.4			25.2	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	63.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.97	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.94	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3104	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3104	1399				3433		1583
Volume (vph)	113	273	0	0	353	1022	0	0	0	863	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1111	0	0	0	938	0	263
RTOR Reduction (vph)	0	0	0	0	48	0	0	0	0	0	0	181
Lane Group Flow (vph)	123	297	0	0	501	886	0	0	0	938	0	82
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	6	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.6	67.7			52.4	110.0				33.8		33.8
Effective Green, g (s)	11.3	67.7			52.4	110.0				34.3		34.3
Actuated g/C Ratio	0.10	0.62			0.48	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2178			1479	1399				1070		494
v/s Ratio Prot	0.07	0.08			0.16							0.05
v/s Ratio Perm						c0.63				c0.27		
v/c Ratio	0.68	0.14			0.38	0.63				0.88		0.17
Uniform Delay, d1	47.6	8.9			18.4	0.0				35.8		27.5
Progression Factor	1.00	1.00			0.77	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.1			0.6	1.7				8.2		0.1
Delay (s)	55.2	9.0			14.8	1.7				44.0		27.6
Level of Service	E	A			B	A				D		C
Approach Delay (s)		22.5			7.0			0.0			40.4	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	63.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1451	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1451	659			
Volume (vph)	111	1025	0	0	1003	415	372	21	1012	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1114	0	0	1090	451	404	23	1100	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	267	0	165	5	0	0	0
Lane Group Flow (vph)	121	1114	0	0	1090	184	404	408	545	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.6	37.0			39.9	39.9	46.0	46.0	65.0			
Effective Green, g (s)	10.1	37.0			39.9	39.9	46.0	46.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	163	1197			1682	529	734	633	389			
v/s Ratio Prot	0.07	c0.31			c0.24		0.24	0.28	c0.83			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	0.93			0.65	0.31	0.55	0.65	1.40			
Uniform Delay, d1	48.7	35.3			29.2	25.2	23.0	24.3	22.5			
Progression Factor	1.17	0.61			0.98	2.09	1.00	1.00	1.00			
Incremental Delay, d2	13.2	12.8			1.8	1.2	3.0	5.0	195.5			
Delay (s)	70.0	34.1			30.2	53.9	26.0	29.3	218.0			
Level of Service	E	C			C	D	C	C	F			
Approach Delay (s)		37.7			37.1			96.4			0.0	
Approach LOS		D			D			F			A	

Intersection Summary				
HCM Average Control Delay	58.3	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.98	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1831	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1831	2628
Volume (vph)	446	450	1141	270	442	147	227	82	101	141	270	737
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	485	489	1240	293	480	160	247	67	110	153	293	801
RTOR Reduction (vph)	0	209	95	0	0	67	0	0	98	0	0	78
Lane Group Flow (vph)	485	900	526	293	480	94	153	161	12	0	446	723
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		8	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	59.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		499	1266
v/s Ratio Prot	0.14	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.24	0.28
v/s Ratio Perm						0.06			0.01			
v/c Ratio	0.82	0.94	1.01	1.07	0.45	0.20	0.84	0.86	0.07		0.89	0.57
Uniform Delay, d1	43.8	36.4	31.5	46.5	31.2	26.7	48.0	48.2	44.0		38.5	20.4
Progression Factor	1.28	0.97	0.89	1.00	1.00	1.00	1.26	1.26	2.47		0.64	0.97
Incremental Delay, d2	3.1	5.5	21.0	74.0	1.4	1.0	23.7	26.6	0.1		19.4	1.7
Delay (s)	58.0	41.0	52.2	120.5	32.8	27.7	84.3	87.3	108.7		44.1	21.4
Level of Service	E	D	D	F	C	C	F	F	F		D	C
Approach Delay (s)		48.0			58.7			91.6			29.5	
Approach LOS		D			E			F			C	

Intersection Summary				
HCM Average Control Delay	49.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	99.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3530			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3530			1863	
Volume (vph)	105	218	1025	51	0	120	0	1230	21	0	278	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1337	23	0	302	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1359	0	0	302	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			6									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	6.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.38			0.16	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.83			0.46	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		25.7			27.6	
Progression Factor	1.18	1.19	1.55	1.00		1.00		0.69			1.05	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		4.2			2.3	
Delay (s)	29.8	29.3	40.2	50.9		48.1		22.0			31.1	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.6				48.9		22.0			31.1	
Approach LOS		D				D		C			C	

Intersection Summary					
HCM Average Control Delay	31.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	75.4%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3380		1770	3502		1770	1821		1770	1863	1543
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3380		1770	3502		1770	1821		1770	1863	1543
Volume (vph)	66	441	169	37	572	35	161	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	479	184	40	622	38	197	163	24	38	190	97
RTOR Reduction (vph)	0	45	0	0	6	0	0	8	0	0	0	62
Lane Group Flow (vph)	72	618	0	40	654	0	197	179	0	38	190	15
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	3.1	25.4		1.4	23.7		9.5	9.5		9.3	9.3	9.3
Effective Green, g (s)	3.1	25.4		1.4	23.7		9.5	9.5		9.3	9.3	9.3
Actuated g/C Ratio	0.05	0.41		0.02	0.38		0.15	0.15		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	89	1394		40	1347		273	281		267	281	233
v/s Ratio Prot	c0.04	0.18		0.02	c0.19		c0.11	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.81	0.44		1.00	0.49		0.72	0.64		0.14	0.68	0.06
Uniform Delay, d1	29.0	13.0		30.1	14.3		24.8	24.4		22.7	24.7	22.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.8	0.2		142.3	0.3		9.1	4.6		0.2	6.3	0.1
Delay (s)	68.8	13.2		172.4	14.6		33.8	29.1		22.9	31.0	22.5
Level of Service	E	B		F	B		C	C		C	C	C
Approach Delay (s)		18.7			23.6			31.5			27.5	
Approach LOS		B			C			C			C	

Intersection Summary					
HCM Average Control Delay	23.9	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.59				
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A		
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3460		1770	3514			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3460		1770	3514			1801	1555		1772	
Volume (vph)	18	826	98	152	913	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	900	104	165	992	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	997	0	165	1023	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1557		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.29		c0.09	0.29			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.64		0.84	0.53			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.3		43.6	14.3			40.0	36.2		39.7	
Progression Factor	1.07	0.41		0.82	0.65			1.00	1.00		1.00	
Incremental Delay, d2	210.0	1.8		17.9	0.7			7.7	0.2		0.4	
Delay (s)	262.9	10.4		53.8	10.0			47.7	36.3		40.0	
Level of Service	F	B		D	A			D	D		D	
Approach Delay (s)		15.4			16.0			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	20.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3080		1770	3388		3433	3501		1770	3282	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3080		1770	3388		3433	3501		1770	3282	
Volume (vph)	166	517	315	69	412	65	456	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	562	342	75	448	71	496	701	27	123	743	200
RTOR Reduction (vph)	0	90	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	814	0	75	507	0	496	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.6		5.2	24.7		16.2	35.4		10.8	30.0	
Effective Green, g (s)	12.6	32.6		4.7	24.7		15.7	36.4		10.3	31.0	
Actuated g/C Ratio	0.13	0.33		0.05	0.25		0.16	0.36		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	1004		83	837		539	1274		182	1017	
v/s Ratio Prot	c0.10	c0.26		0.04	0.15		c0.14	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.81		0.90	0.61		0.92	0.57		0.68	0.90	
Uniform Delay, d1	42.5	30.9		47.4	33.3		41.5	25.5		43.2	33.1	
Progression Factor	1.14	0.38		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.4	6.0		66.1	3.2		20.9	1.9		7.6	12.8	
Delay (s)	63.9	17.7		113.5	36.6		62.4	27.4		50.8	45.9	
Level of Service	E	B		F	D		E	C		D	D	
Approach Delay (s)		25.4			46.3			41.6			46.4	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM Average Control Delay	39.2	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.85				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	83.2%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group

SYNCHRO LOS SHEETS
ALTERNATIVE #2
2010

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3389		1770	3518		1770	3422		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3389		1770	3518		1770	3422		1770	1863	1583
Volume (vph)	514	847	333	104	742	30	116	221	65	61	215	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	351	109	781	32	122	233	68	64	226	208
RTOR Reduction (vph)	0	34	0	0	2	0	0	25	0	0	0	176
Lane Group Flow (vph)	541	1209	0	109	811	0	122	274	0	64	226	32
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	53.5		10.5	29.4		13.1	13.1		16.9	16.9	16.9
Effective Green, g (s)	34.6	53.5		10.5	29.4		13.1	13.1		16.9	16.9	16.9
Actuated g/C Ratio	0.31	0.49		0.10	0.27		0.12	0.12		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1648		169	940		211	409		272	286	243
v/s Ratio Prot	c0.31	0.36		0.06	c0.23		0.07	c0.08		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.73		0.64	0.86		0.58	0.67		0.24	0.79	0.13
Uniform Delay, d1	37.2	22.6		48.0	38.4		45.8	46.4		40.9	44.8	40.2
Progression Factor	1.00	1.00		0.90	1.31		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	2.9		6.1	7.8		3.1	3.9		0.4	13.8	0.2
Delay (s)	68.0	25.5		49.1	58.0		49.0	50.3		41.3	58.6	40.5
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		36.4			56.9			49.9			48.8	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	45.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3459			3438		1770	3488		1770	3450	
Flt Permitted	0.21	1.00			0.71		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	384	3459			2437		1770	3488		1770	3450	
Volume (vph)	122	709	137	45	551	123	194	647	69	118	757	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	47	580	129	204	681	73	124	797	162
RTOR Reduction (vph)	0	17	0	0	18	0	0	7	0	0	13	0
Lane Group Flow (vph)	128	873	0	0	738	0	204	747	0	124	946	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	37.9	37.9			37.9		16.2	43.1		16.0	43.9	
Effective Green, g (s)	37.9	37.9			37.9		15.2	44.1		16.0	44.9	
Actuated g/C Ratio	0.34	0.34			0.34		0.14	0.40		0.15	0.41	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	132	1190			840		245	1398		257	1408	
v/s Ratio Prot		0.25					c0.12	0.21		0.07	c0.27	
v/s Ratio Perm	c0.33				0.30							
v/c Ratio	0.97	0.73			0.88		0.83	0.53		0.48	0.67	
Uniform Delay, d1	35.5	31.6			33.9		46.2	25.1		43.2	26.5	
Progression Factor	0.47	0.52			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	56.3	1.7			10.3		20.8	1.5		1.4	2.6	
Delay (s)	73.0	18.1			44.2		67.0	26.6		44.6	29.1	
Level of Service	E	B			D		E	C		D	C	
Approach Delay (s)		25.0			44.2			35.2			30.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#2 AM

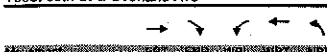
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	79	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	83	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	308	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	308	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	92	100	100	100
cM capacity (veh/h)	1545			1618			701	640	1079	672	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	85	1
Volume Left	0	81	2	0
Volume Right	2	1	83	0
cSH	1545	1616	1065	640
Volume to Capacity	0.00	0.05	0.08	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↰	↳		⇳		↰	↳	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00		1.00	1.00	
Frt		1.00	0.99		1.00	0.89		0.97		1.00	0.94	
Flt Protected		0.95	1.00		0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1770	1842		1770	1665		1795		1770	1760	
Flt Permitted		0.65	1.00		0.71	1.00		0.98		0.31	1.00	
Satd. Flow (perm)		1214	1842		1326	1665		1758		570	1760	
Volume (vph)	44	61	5	94	47	112	11	158	57	119	155	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	64	5	99	49	118	12	166	60	125	163	95
RTOR Reduction (vph)	0	3	0	0	60	0	0	24	0	0	48	0
Lane Group Flow (vph)	46	66	0	99	107	0	0	214	0	125	210	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	30.2	30.2		30.2	30.2			11.8		22.8	22.8	
Effective Green, g (s)	29.7	29.7		29.7	29.7			11.3		22.3	22.3	
Actuated g/C Ratio	0.49	0.49		0.49	0.49			0.19		0.37	0.37	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	601	912		658	824			331		352	654	
v/s Ratio Prot		0.04			c0.06					0.04	c0.12	
v/s Ratio Perm	0.04			c0.07				c0.12		0.09		
v/c Ratio	0.08	0.07		0.15	0.13			0.65		0.36	0.32	
Uniform Delay, d1	8.0	7.9		8.3	8.2			22.5		13.9	13.5	
Progression Factor	1.00	1.00		0.77	0.56			1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.5	0.3			4.3		0.6	0.3	
Delay (s)	8.2	8.1		6.8	4.9			26.8		14.5	13.7	
Level of Service	A	A		A	A			C		B	B	
Approach Delay (s)		8.1			5.8			26.8			14.0	
Approach LOS		A			A			C			B	

Intersection Summary				
HCM Average Control Delay	14.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↳		↰	↑	⇂	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1751	
Flt Permitted	1.00		0.60	1.00	0.96	
Satd. Flow (perm)	1855		1125	1863	1751	
Volume (vph)	230	8	26	195	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	8	26	205	62	11
RTOR Reduction (vph)	1	0	0	0	10	0
Lane Group Flow (vph)	249	0	26	205	63	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	48.0		48.0	48.0	6.0	
Effective Green, g (s)	47.5		47.5	47.5	4.5	
Actuated g/C Ratio	0.79		0.79	0.79	0.08	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1469		891	1475	131	
v/s Ratio Prot	c0.13			0.11	c0.04	
v/s Ratio Perm			0.02			
v/c Ratio	0.17		0.03	0.14	0.48	
Uniform Delay, d1	1.5		1.3	1.5	26.6	
Progression Factor	0.85		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.1	0.2	2.8	
Delay (s)	1.5		1.4	1.7	29.4	
Level of Service	A		A	A	C	
Approach Delay (s)	1.5			1.6	29.4	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	5.2	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.20			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	29.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇳			⇳			↰	↳		↰	↳
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	1.00
Frt		0.93			1.00			1.00	0.99		1.00	0.98
Flt Protected		0.99			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1720			1829			1770	1850		1770	1821
Flt Permitted		0.92			0.91			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1597			1505			1770	1850		1770	1821
Volume (vph)	60	76	152	37	86	4	38	293	14	25	445	77
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	80	159	39	91	4	38	308	15	24	466	81
RTOR Reduction (vph)	0	70	0	0	2	0	0	3	0	0	10	0
Lane Group Flow (vph)	0	212	0	0	132	0	38	320	0	24	537	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		319			301		85	1003		32	932	
v/s Ratio Prot							c0.02	0.17		0.01	c0.29	
v/s Ratio Perm		c0.13			0.09							
v/c Ratio		0.67			0.44		0.45	0.32		0.75	0.58	
Uniform Delay, d1		18.5			17.5		23.2	6.3		24.4	8.4	
Progression Factor		1.00			1.00		0.68	1.16		1.00	1.00	
Incremental Delay, d2		4.7			0.7		2.7	0.8		62.8	2.6	
Delay (s)		23.1			18.3		23.0	8.2		87.2	11.0	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		23.1			18.3			9.7			14.2	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇳			⇳			⇳			⇳	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	78	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	82	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	172	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	0.29	0.15	0.17	0.00
Departure Headway (s)	4.3	4.6	4.0	4.3
Degree Utilization, x	0.01	0.09	0.19	0.10
Capacity (veh/h)	788	728	870	810
Control Delay (s)	7.3	8.1	8.0	7.6
Approach Delay (s)	7.3	8.1	8.0	7.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.9			
HCM Level of Service	A			
Intersection Capacity Utilization	32.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	53	19	17	190	240	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	20	18	200	253	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	496	261	268			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	496	261	268			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	526	778	1295			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	76	18	200	268
Volume Left	56	18	0	0
Volume Right	20	0	0	16
cSH	575	1295	1700	1700
Volume to Capacity	0.13	0.01	0.12	0.16
Queue Length 95th (ft)	11	1	0	0
Control Delay (s)	12.2	7.8	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.2	0.6	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.97		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1658		1770	3539	1583		3518	
Flt Permitted		0.97	1.00	0.95	0.96		0.53	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1658		993	3539	1583		3299	
Volume (vph)	39	29	117	330	4	29	59	254	410	17	323	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	347	4	31	62	267	432	18	340	9
RTOR Reduction (vph)	0	0	116	0	6	0	0	0	144	0	2	0
Lane Group Flow (vph)	0	70	7	197	177	0	62	267	288	0	365	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	14.8	14.8		67.8	67.8	67.8		67.8	
Effective Green, g (s)		5.9	5.9	14.8	14.8		67.3	67.3	67.3		67.3	
Actuated g/C Ratio		0.06	0.06	0.15	0.16		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.0	2.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	249	245		668	2382	1065		2220	
v/s Ratio Prot		c0.04		c0.12	0.11			0.08				
v/s Ratio Perm			0.00				0.06		c0.19		0.11	
v/c Ratio		0.65	0.08	0.79	0.72		0.09	0.11	0.26		0.16	
Uniform Delay, d1		46.1	44.5	41.1	40.6		5.7	5.8	6.6		6.0	
Progression Factor		1.00	1.00	1.43	1.45		0.04	0.05	5.10		1.00	
Incremental Delay, d2		12.1	0.3	15.3	9.9		0.2	0.1	0.4		0.2	
Delay (s)		58.2	44.7	74.0	68.8		0.4	0.3	33.9		6.2	
Level of Service		E	D	E	E		A	A	C		A	
Approach Delay (s)		49.0			71.5			19.0			6.2	
Approach LOS		D			E			B			A	

Intersection Summary				
HCM Average Control Delay	31.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	376	43	293	223	79	158
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	395	45	266	235	83	166
RTOR Reduction (vph)	0	29	0	0	0	131
Lane Group Flow (vph)	395	16	266	235	83	35
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	21.5	36.3	11.3	71.0	56.7	21.5
Effective Green, g (s)	21.0	35.8	10.8	71.0	56.2	21.0
Actuated g/C Ratio	0.21	0.36	0.11	0.71	0.56	0.21
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	567	371	1323	1047	332
v/s Ratio Prot	c0.22	0.01	c0.08	c0.13	0.04	0.02
v/s Ratio Perm						
v/c Ratio	1.06	0.03	0.72	0.18	0.08	0.11
Uniform Delay, d1	39.5	20.8	43.1	4.8	10.0	31.9
Progression Factor	1.10	3.27	0.83	0.35	1.00	1.00
Incremental Delay, d2	62.7	0.0	6.4	0.3	0.1	0.1
Delay (s)	106.3	68.0	42.1	2.0	10.2	32.0
Level of Service	F	E	D	A	B	C
Approach Delay (s)	102.4			23.3	24.8	
Approach LOS	F			C	C	

Intersection Summary				
HCM Average Control Delay	52.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	41.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected		0.95	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1863	1583	1681	1701	1770	3539	1583	1770	1798	
Flt Permitted		0.95	1.00	1.00	0.95	0.96	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1863	1583	1681	1701	1770	3539	1583	1770	1798	
Volume (vph)	5	21	18	724	79	0	89	86	814	76	236	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	19	762	83	0	93	91	857	80	248	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	3	411	434	0	93	91	857	80	312	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.9	2.9	2.9	20.1	25.1		4.8	16.0	64.0	4.5	15.7	
Effective Green, g (s)	2.4	2.4	2.4	25.1	25.1		4.3	16.5	64.0	4.0	16.2	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.07	0.26	1.00	0.06	0.25	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	70	59	659	667		119	912	1583	111	455	
v/s Ratio Prot	0.00	0.01		0.24	c0.26		0.05	0.03		0.05	c0.17	
v/s Ratio Perm			0.00						c0.54			
v/c Ratio	0.08	0.31	0.01	0.62	0.65		0.78	0.10	0.54	0.72	0.69	
Uniform Delay, d1	29.7	30.0	29.7	15.6	15.9		29.4	18.1	0.0	29.5	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	1.6	2.0		25.7	0.0	1.3	17.6	3.9	
Delay (s)	29.9	30.9	29.7	17.2	17.9		55.1	18.1	1.3	47.1	25.5	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.3			17.6			7.6			29.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3390	1441				3433		1583
Volume (vph)	119	216	190	0	691	979	0	0	0	832	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1031	0	0	0	876	0	136
RTOR Reduction (vph)	0	75	0	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	125	352	0	0	727	1031	0	0	0	876	0	40
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.4			39.4	100.0				29.1		29.1
Effective Green, g (s)	19.0	62.4			39.4	100.0				29.6		29.6
Actuated g/C Ratio	0.19	0.62			0.39	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2054			1336	1441				1016		469
v/s Ratio Prot	0.07	0.11			0.21					c0.26		
v/s Ratio Perm						c0.72						0.03
v/c Ratio	0.37	0.17			0.54	0.72				0.86		0.09
Uniform Delay, d1	35.3	7.9			23.4	0.0				33.3		25.4
Progression Factor	1.00	1.00			0.72	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.6				7.6		0.1
Delay (s)	35.6	8.1			17.6	1.6				40.9		25.5
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.3			8.3			0.0		38.8		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	18.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.93	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1451	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1451	1504			
Volume (vph)	74	974	0	0	1060	347	611	2	1305	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1025	0	0	1116	365	643	2	1374	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	248	0	78	32	0	0	0
Lane Group Flow (vph)	78	1025	0	0	1116	117	607	884	668	0	0	0
Turn Type	Prot						Perm	Split		custom		
Protected Phases	5	2			6			4	4	4 1		
Permitted Phases							6					
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	551	677			
v/s Ratio Prot	0.04	c0.20			c0.24		0.36	c0.44	c0.44			
v/s Ratio Perm						0.07						
v/c Ratio	0.24	0.43			0.75	0.23	0.95	1.16	0.99			
Uniform Delay, d1	35.2	17.8			30.4	25.0	30.1	31.0	27.2			
Progression Factor	0.70	0.48			0.47	0.27	1.00	1.00	1.00			
Incremental Delay, d2	1.5	0.5			2.8	0.8	23.8	87.1	30.9			
Delay (s)	26.1	8.8			17.2	7.5	53.9	118.1	58.1			
Level of Service	C	A			B	A	D	F	E			
Approach Delay (s)		10.1			14.8			78.0			0.0	
Approach LOS		B			B			E			A	

Intersection Summary				
HCM Average Control Delay	41.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1793	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1793	2628
Volume (vph)	603	1306	370	75	743	139	42	3	42	161	45	628
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	635	1375	389	79	782	146	44	3	44	169	47	661
RTOR Reduction (vph)	0	0	188	0	0	28	0	0	41	0	0	194
Lane Group Flow (vph)	635	1375	201	79	782	118	23	24	3	0	216	467
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 0
Permitted Phases						2			7			
Actuated Green, G (s)	20.3	41.0	52.2	6.8	26.8	26.5	7.7	7.7	7.7		30.5	50.8
Effective Green, g (s)	19.8	40.5	51.7	6.3	27.0	27.0	7.2	7.2	7.2		30.0	49.8
Actuated g/C Ratio	0.20	0.40	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	680	1373	745	112	956	427	121	122	114		538	1309
v/s Ratio Prot	0.18	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.12	0.18
v/s Ratio Perm						0.07			0.00			
v/c Ratio	0.93	1.00	0.27	0.71	0.82	0.28	0.19	0.20	0.03		0.40	0.36
Uniform Delay, d1	39.5	29.8	13.6	45.9	34.2	28.8	43.7	43.7	43.1		27.9	15.3
Progression Factor	1.10	0.60	0.45	1.00	1.00	1.00	1.00	1.00	1.00		1.19	0.95
Incremental Delay, d2	14.7	19.0	0.1	15.2	7.7	1.6	0.6	0.6	0.1		2.1	0.7
Delay (s)	58.2	36.9	6.2	61.1	41.9	30.4	44.2	44.3	43.2		35.2	15.3
Level of Service	E	D	A	E	D	C	D	D	D		D	B
Approach Delay (s)		37.5			41.8			43.7			20.2	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay	35.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.96	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.96	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	257	0	0	0	0	481	9	0	127	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	506	9	0	134	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	514	0	0	134	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	38.8					85.0			66.4	
Effective Green, g (s)	27.5	27.5	36.1					84.5			65.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.84			0.66	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2977			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.15			0.07	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.23			0.13	
Uniform Delay, d1	26.8	26.8	21.2					7.4			10.5	
Progression Factor	0.96	0.96	0.80					1.00			0.91	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.3	
Delay (s)	26.0	25.8	17.0					7.6			9.8	
Level of Service	C	C	B					A			A	
Approach Delay (s)		19.2			0.0			7.6			9.8	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	12.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	29.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3342		1770	3482		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3342		1770	3482		1770	1832		1770	1863	1583
Volume (vph)	393	442	261	36	505	61	272	210	26	28	281	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	465	275	38	532	64	286	221	27	29	212	108
RTOR Reduction (vph)	0	71	0	0	9	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	669	0	38	587	0	286	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	26.5	43.2		5.7	22.4		20.1	20.1		16.0	16.0	16.0
Effective Green, g (s)	26.0	43.7		5.2	22.9		19.6	19.6		15.5	15.5	15.5
Actuated g/C Ratio	0.26	0.44		0.05	0.23		0.20	0.20		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	460	1460		92	797		347	359		274	289	245
v/e Ratio Prot	c0.23	0.20		0.02	c0.17		c0.16	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.90	0.46		0.41	0.74		0.82	0.68		0.11	0.73	0.07
Uniform Delay, d1	35.7	19.8		45.9	35.7		38.5	37.3		36.9	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.98	0.97		0.81	0.85	1.27
Incremental Delay, d2	20.4	1.0		3.0	6.0		14.6	5.0		0.2	9.0	0.1
Delay (s)	56.1	20.8		48.8	41.7		52.2	41.3		29.5	43.3	45.8
Level of Service	E	C		D	D		D	D		C	D	D
Approach Delay (s)		33.6			42.2			47.2			42.9	
Approach LOS		C			D			D			D	

Intersection Summary						
HCM Average Control Delay	39.5	HCM Level of Service	D			
HCM Volume to Capacity ratio	0.81					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D			
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3371		1770	3514		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3371		1770	3514		1770	3487		1770	3497	
Volume (vph)	94	260	121	100	447	22	127	543	59	49	769	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	274	127	105	471	23	134	572	62	52	809	69
RTOR Reduction (vph)	0	59	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	342	0	105	490	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	18.1		9.3	19.5		12.6	50.4		7.2	45.0	
Effective Green, g (s)	6.9	18.6		8.3	20.0		11.6	50.9		6.2	45.5	
Actuated g/C Ratio	0.07	0.19		0.08	0.20		0.12	0.51		0.06	0.46	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	627		147	703		205	1775		110	1591	
v/s Ratio Prot	0.06	0.10		c0.06	c0.14		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.64		0.71	0.70		0.65	0.35		0.47	0.55	
Uniform Delay, d1	45.9	36.9		44.7	37.2		42.3	14.7		45.3	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.0		15.2	3.0		7.3	0.6		3.2	1.3	
Delay (s)	78.0	37.8		59.9	40.2		49.6	15.3		48.5	21.1	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		45.8			43.6			21.2			22.6	
Approach LOS		D			D			C			C	

Intersection Summary						
HCM Average Control Delay	30.9	HCM Level of Service	C			
HCM Volume to Capacity ratio	0.59					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0			
Intersection Capacity Utilization	61.8%	ICU Level of Service	B			
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3429		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3429		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	273	71	43	347	177	69	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	287	75	45	365	186	73	165	32	26	53	9
RTOR Reduction (vph)	0	14	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	348	0	45	365	101	73	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		6.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1783		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	0.10		c0.03	c0.10		0.04	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.19		0.53	0.19	0.12	0.29	0.73			0.35	
Uniform Delay, d1	48.1	12.8		46.5	11.7	11.2	38.4	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.9	0.2		4.5	0.2	0.3	0.5	9.6			0.7	
Delay (s)	59.1	13.1		51.0	11.9	11.5	38.9	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		16.0			14.7			47.5			40.3	
Approach LOS		B			B			D			D	

Intersection Summary						
HCM Average Control Delay	23.4	HCM Level of Service	C			
HCM Volume to Capacity ratio	0.31					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A			
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3438		1770	3539	1583	1770	1863		1583	1770	1848
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1770	3438		1770	3539	1583	1770	1863		1583	1770	1848
Volume (vph)	28	258	61	52	527	195	131	284		39	116	183	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	64	55	555	205	138	299		41	122	193	11
RTOR Reduction (vph)	0	16	0	0	0	105	0	0		32	0	2	0
Lane Group Flow (vph)	29	320	0	55	555	100	138	299		9	122	202	0
Turn Type	Prot			Prot		Perm	Prot			Perm	Prot		
Protected Phases	1	6		5	2		3	8			7	4	
Permitted Phases						2				8			
Actuated Green, G (s)	3.5	46.4		7.0	48.9	48.9	12.0	23.6		23.6	8.5	20.1	
Effective Green, g (s)	4.0	46.4		6.5	48.9	48.9	11.5	23.1		23.1	8.0	19.6	
Actuated g/C Ratio	0.04	0.46		0.06	0.49	0.49	0.12	0.23		0.23	0.08	0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5		3.5	3.5		
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5		2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1595		115	1731	774	204	430		366	142	362	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		0.08	c0.16			c0.07	0.11	
v/s Ratio Perm						0.06				0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.13	0.68	0.69		0.03	0.86	0.56	
Uniform Delay, d1	46.8	15.8		45.1	15.5	13.9	42.5	34.8		29.7	45.4	36.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.04	0.83	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.3	7.8	2.9		0.0	36.0	1.5	
Delay (s)	49.6	16.1		47.4	16.0	14.3	50.3	37.7		29.8	83.1	31.6	
Level of Service	D	B		D	B	B	D	D		C	F	C	
Approach Delay (s)		18.8			17.7			40.6			50.9		
Approach LOS		B			B			D			D		

Intersection Summary						
HCM Average Control Delay	28.8	HCM Level of Service	C			
HCM Volume to Capacity ratio	0.46					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0			
Intersection Capacity Utilization	52.4%	ICU Level of Service	A			
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (vph/h)	24	372	16	90	754	21	26	13	74	8	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	392	17	95	794	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	816			408			1039	1456	204	1325	1453	408
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	816			408			1039	1456	204	1325	1453	408
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			93	86	90	98	97	100
cM capacity (veh/h)	808			1147			165	114	803	85	115	593

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	261	147	95	529	287	34	86	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	808	1700	1700	1147	1700	1700	152	540	117
Volume to Capacity	0.03	0.15	0.09	0.08	0.31	0.17	0.23	0.16	0.05
Queue Length 95th (ft)	2	0	0	7	0	0	21	14	4
Control Delay (s)	9.6	0.0	0.0	8.4	0.0	0.0	35.5	12.9	37.5
Lane LOS	A			A			E	B	E
Approach Delay (s)	0.6			0.9			19.4		37.5
Approach LOS							C		E

Intersection Summary					
Average Delay	2.4				
Intersection Capacity Utilization	36.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3470		1770	3498			1805	1583		1810	
Flt Permitted	0.95	1.00		0.99	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3470		1770	3498			1805	1583		1545	
Volume (vph)	3	382	57	122	635	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	402	60	128	668	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	454	0	128	720	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split			Perm	Perm	
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases										7	8	
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1700		191	2078			310	272		108	
v/s Ratio Prot	0.00	c0.13		c0.07	c0.21			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.27		0.67	0.35			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.0		42.9	10.4			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.3	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.3		54.2	7.5			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.7			14.6			46.6			45.5	
Approach LOS		B			B			D			D	

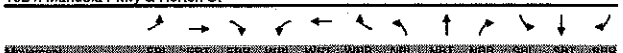
Intersection Summary					
HCM Average Control Delay	22.4	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	52.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.88	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3366		1770	3387		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.05	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3366		1770	3387		3433	3534		1770	3508	
Volume (vph)	92	282	137	32	446	179	304	765	8	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	297	144	34	469	188	320	805	8	168	917	57
RTOR Reduction (vph)	0	66	0	0	43	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	375	0	34	614	0	320	833	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	22.0		6.5	22.0		15.0	43.2		13.3	41.5	
Effective Green, g (s)	7.5	21.0		7.5	21.0		14.0	43.2		12.3	41.5	
Actuated g/C Ratio	0.08	0.21		0.08	0.21		0.14	0.43		0.12	0.42	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	707		133	711		481	1527		218	1456	
v/s Ratio Prot	c0.05	0.11		0.02	c0.18		c0.09	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.53		0.26	0.86		0.67	0.55		0.77	0.67	
Uniform Delay, d1	45.3	35.1		43.6	38.1		40.8	21.1		42.5	23.6	
Progression Factor	1.31	1.04		1.14	1.09		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.6		0.4	9.9		2.7	1.4		14.2	2.4	
Delay (s)	74.4	37.0		49.9	51.3		43.5	22.5		56.6	26.1	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.7			51.2			28.3			30.6	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	35.9	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	71.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3501		1770	3496			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.94	
Satd. Flow (perm)	1770	3501		1770	3496			3172			2914	
Volume (vph)	50	379	29	78	565	50	10	165	62	68	243	55
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	399	31	82	595	53	11	174	65	72	256	58
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	54	0
Lane Group Flow (vph)	53	420	0	82	637	0	0	195	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	25.9		3.9	26.9			9.2			9.2	
Effective Green, g (s)	2.4	25.9		3.4	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			2.0			3.0	
Lane Grp Cap (vph)	85	1814		120	1881			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.18							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.62	0.23		0.68	0.34			0.35			0.71	
Uniform Delay, d1	23.4	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.71	1.31		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.9	0.3		12.1	0.5			0.4			4.7	
Delay (s)	25.5	8.9		34.8	7.0			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		10.7			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

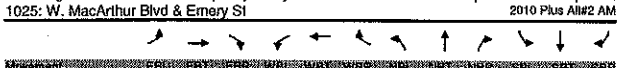
Intersection Summary					
HCM Average Control Delay	14.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	51.1%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	225	57	2	8	78	26	2	1	2	16	4	134
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	237	60	2	8	82	27	2	1	2	17	4	141

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	237	62	118	5	162
Volume Left (vph)	237	0	8	2	17
Volume Right (vph)	0	2	27	2	141
Hadj (s)	0.53	0.01	0.09	0.13	0.47
Departure Headway (s)	5.5	5.0	4.7	5.0	4.5
Degree Utilization, x	0.36	0.09	0.15	0.01	0.20
Capacity (veh/h)	626	693	728	645	744
Control Delay (s)	10.5	7.3	8.5	8.1	8.6
Approach Delay (s)	9.8		8.5	8.1	8.6
Approach LOS	A		A	A	A

Intersection Summary			
Delay	9.2		
HCM Level of Service	A		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	29	16	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	16	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	4		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.9	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3504			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3504			3490	
Volume (vph)	60	193	12	111	256	20	0	1010	72	0	947	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1063	76	0	997	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	409	0	0	1135	0	0	1092	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.32			0.31	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.54			0.53	
Uniform Delay, d1		43.9			42.1			12.8			12.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.0			1.0	
Delay (s)		52.4			46.5			13.8			13.5	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.8			13.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3262			5076	
Volume (vph)	0	0	0	65	491	719	12	515	0	0	991	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	495	756	13	542	0	0	1043	13
RTOR Reduction (vph)	0	0	0	0	0	194	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	562	0	555	0	0	1055	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					36.3	36.3		54.7			54.7	
Effective Green, g (s)					36.3	36.3		55.7			55.7	
Actuated g/C Ratio					0.36	0.36		0.56			0.56	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1277	575		1817			2827	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.36		0.17				
v/c Ratio					0.43	0.98		0.31			0.37	
Uniform Delay, d1					24.1	31.5		11.8			12.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	31.5		0.4			0.4	
Delay (s)					24.2	62.0		12.3			12.8	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			46.6			12.3			12.8	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						0.95			0.95	
Frt		0.98						0.99			1.00	
Flt Protected		1.00						1.00			0.95	
Satd. Flow (prot)		3477						3488			3433	
Flt Permitted		1.00						1.00			0.95	
Satd. Flow (perm)		3477						3488			3433	
Volume (vph)	16	376	47	0	0	0	0	509	54	494	590	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	536	57	457	621	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	585	0	457	621	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	46.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		4.0	4.0	
Vehicle Extension (s)		2.0						2.0		2.0	2.0	
Lane Grp Cap (vph)		667						1604		613	2462	
v/s Ratio Prot		c0.13						c0.17		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.36		0.75	0.25	
Uniform Delay, d1		26.3						12.3		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.6		4.3	0.0	
Delay (s)		28.4						12.9		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			12.9			15.7	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3426		1770	3503		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3426		1770	3503		1770	3421		1770	1863	1583
Volume (vph)	290	760	207	139	862	64	194	450	129	130	308	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	218	146	907	67	204	474	136	146	324	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	24	0	0	0	302
Lane Group Flow (vph)	305	996	0	146	969	0	204	586	0	146	324	207
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	39.2		12.6	30.7		20.0	20.0		21.2	21.2	21.2
Effective Green, g (s)	21.1	40.2		12.6	31.7		20.0	20.0		21.2	21.2	21.2
Actuated g/C Ratio	0.19	0.37		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1252		203	1010		322	622		341	359	305
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.12	c0.17		0.08	c0.17	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.80		0.72	0.96		0.63	0.94		0.43	0.90	0.68
Uniform Delay, d1	43.4	31.2		47.0	38.5		41.6	44.4		39.1	43.4	41.2
Progression Factor	1.00	1.00		1.18	0.97		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.3		4.5	10.1		2.8	19.4		0.9	24.9	5.9
Delay (s)	68.2	36.5		60.1	47.3		44.3	64.2		40.0	68.3	47.1
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		43.8			49.0			59.3			53.1	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	50.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3438		1770	3499		1770	3448	
Flt Permitted	0.19	1.00			0.75		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	358	3385			2572		1770	3499		1770	3448	
Volume (vph)	198	635	260	52	865	149	270	1084	89	186	978	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	55	700	158	284	1141	94	196	1027	213
RTOR Reduction (vph)	0	41	0	0	18	0	0	5	0	0	16	0
Lane Group Flow (vph)	208	901	0	0	895	0	284	1230	0	196	1224	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		2			6		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	156	1477			1122		274	1113		241	1034	
v/s Ratio Prot		0.27					0.16	c0.35		0.11	c0.35	
v/s Ratio Perm	c0.58				0.35							
v/c Ratio	1.33	0.61			0.80		1.04	1.10		0.81	1.18	
Uniform Delay, d1	31.0	23.8			26.8		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	176.6	0.5			4.0		64.2	60.4		18.5	92.7	
Delay (s)	210.7	26.8			30.8		110.7	97.9		64.7	131.2	
Level of Service	F	C			C		F	F		E	F	
Approach Delay (s)		60.0			30.8			100.9			122.1	
Approach LOS		E			C			F			F	

Intersection Summary				
HCM Average Control Delay	84.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	112.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	141	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	148	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	19			20			342	341	20	490	341	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	490	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	86	100	100	100
cM capacity (veh/h)	1599			1596			647	626	1058	869	626	1061

Direction, Lane #	EB	WB	NB	SB
Volume Total	21	168	152	2
Volume Left	1	151	2	1
Volume Right	0	0	148	0
cSH	1599	1596	1038	447
Volume to Capacity	0.00	0.09	0.15	0.00
Queue Length 95th (ft)	0	8	13	0
Control Delay (s)	0.4	6.8	9.1	13.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.1	13.1
Approach LOS			A	B

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	31.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		↟		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	4.0
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.99		1.00	0.90		0.96			1.00	0.97
Flt Protected		0.95	1.00		0.95	1.00		1.00			0.95	1.00
Satd. Flow (prot)		1770	1844		1770	1672		1779			1770	1798
Flt Permitted		0.96	1.00		0.70	1.00		1.00			0.25	1.00
Satd. Flow (perm)		674	1844		1303	1672		1772			475	1798
Volume (vph)	101	79	6	157	106	227	10	499	250	83	217	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	106	83	6	165	112	239	11	525	263	94	228	69
RTOR Reduction (vph)	0	4	0	0	124	0	0	30	0	0	19	0
Lane Group Flow (vph)	106	85	0	165	227	0	0	769	0	94	278	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	18.5	18.5		18.5	18.5			27.3		34.5	34.5	
Effective Green, g (s)	18.0	18.0		18.0	18.0			26.8		34.0	34.0	
Actuated g/C Ratio	0.30	0.30		0.30	0.30			0.45		0.57	0.57	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	202	553		391	502			791		338	1019	
v/s Ratio Prot		0.05			0.14					0.01	c0.15	
v/s Ratio Perm	c0.16			0.13				c0.43		0.14		
v/c Ratio	0.52	0.15		0.42	0.45			0.97		0.28	0.27	
Uniform Delay, d1	17.4	15.4		16.8	17.0			16.2		15.6	6.7	
Progression Factor	1.00	1.00		1.23	1.49			1.00		1.00	1.00	
Incremental Delay, d2	9.4	0.6		3.2	2.9			25.2		0.5	0.1	
Delay (s)	26.9	16.0		24.0	28.2			41.4		16.0	6.8	
Level of Service	C	B		C	C			D		B	A	
Approach Delay (s)		21.9			26.9			41.4			9.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↟		↰	↑	↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0		4.0	4.0		
Lane Util. Factor	1.00		1.00	1.00		
Frt	0.99		1.00	1.00		
Flt Protected	1.00		0.95	1.00		
Satd. Flow (prot)	1853		1770	1863	1751	
Flt Permitted	1.00		0.49	1.00	0.95	
Satd. Flow (perm)	1853		917	1863	1751	
Volume (vph)	401	16	33	377	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	422	17	35	397	120	21
RTOR Reduction (vph)	1	0	0	0	16	0
Lane Group Flow (vph)	438	0	35	397	126	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	44.0		44.0	44.0	9.0	
Effective Green, g (s)	43.5		43.5	43.5	8.5	
Actuated g/C Ratio	0.72		0.72	0.72	0.14	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1343		665	1351	248	
v/s Ratio Prot	c0.24			0.21	c0.07	
v/s Ratio Perm			0.04			
v/c Ratio	0.33		0.05	0.29	0.50	
Uniform Delay, d1	3.0		2.4	2.9	23.6	
Progression Factor	0.28		1.00	1.00	1.00	
Incremental Delay, d2	0.5		0.2	0.6	1.6	
Delay (s)	1.3		2.5	3.4	25.4	
Level of Service	A		A	A	C	
Approach Delay (s)	1.3			3.4	25.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟		↰	↱		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1775			1804		1770	1842		1770	1748	
Flt Permitted		0.81			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1469			1565		1770	1842		1770	1748	
Volume (vph)	167	224	68	36	112	20	163	657	44	19	354	176
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	176	236	72	38	118	21	172	692	46	20	373	187
RTOR Reduction (vph)	0	11	0	0	9	0	0	4	0	0	33	0
Lane Group Flow (vph)	0	473	0	0	168	0	172	734	0	20	527	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		427			455		222	874		29	639	
v/s Ratio Prot							c0.10	c0.40		0.01	0.30	
v/s Ratio Perm		c0.32			0.11							
v/c Ratio		1.11			0.37		0.77	0.84		0.69	0.82	
Uniform Delay, d1		19.5			15.5		23.3	12.6		26.9	15.9	
Progression Factor		1.00			1.00		0.91	1.06		0.98	1.04	
Incremental Delay, d2		75.8			0.4		13.1	8.4		40.6	9.7	
Delay (s)		95.3			15.9		34.3	21.8		66.9	26.1	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		95.3			15.9			24.1			27.5	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

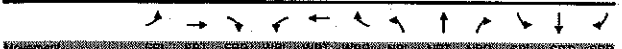
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	145	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	153	71	5	146	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	81	119	241	153								
Volume Left (vph)	4	107	18	5								
Volume Right (vph)	62	12	71	1								
Hadj (s)	0.42	0.16	-0.13	0.04								
Departure Headway (s)	4.6	5.1	4.5	4.7								
Degree Utilization, X	0.10	0.17	0.30	0.20								
Capacity (veh/h)	705	649	767	715								
Control Delay (s)	8.1	9.1	9.4	8.9								
Approach Delay (s)	8.1	9.1	9.4	8.9								
Approach LOS	A	A	A	A								

Intersection Summary			
Delay	9.0		
HCM Level of Service	A		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	59	34	18	804	295	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	62	36	19	731	312	94
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	1127	356	405			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1127	356	405			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	95	98			
cM capacity (veh/h)	223	689	1153			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	94	19	731	405
Volume Left	58	19	0	0
Volume Right	36	0	0	94
cSH	300	1153	1700	1700
Volume to Capacity	0.31	0.02	0.43	0.24
Queue Length 95th (ft)	32	1	0	0
Control Delay (s)	22.4	8.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	22.4	0.2		0.0
Approach LOS	C			

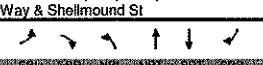
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.98		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1657		1770	3539	1452		3459	
Flt Permitted		0.97	1.00	0.95	0.98		0.39	1.00	1.00		0.92	
Satd. Flow (perm)		1798	1583	1681	1657		724	3539	1452		3200	
Volume (vph)	12	6	95	781	63	53	197	992	206	82	387	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	6	100	801	66	56	144	413	217	23	407	63
RTOR Reduction (vph)	0	0	94	0	4	0	0	0	134	0	10	0
Lane Group Flow (vph)	0	19	6	474	445	0	144	413	83	0	483	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			

Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	49.4	49.4			42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	49.4	49.4			42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.45	0.45			0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	4.0	4.0			3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	8.0	8.0			3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	744		278	1358	557		1228	
v/s Ratio Prot		c0.01		c0.26	0.27			0.12				
v/s Ratio Perm			0.00				c0.20		0.06		0.15	
v/c Ratio		0.17	0.06	0.63	0.60		0.52	0.30	0.15		0.39	
Uniform Delay, d1		49.3	49.0	23.2	22.8		26.1	23.7	22.2		24.6	
Progression Factor		1.00	1.00	0.97	0.96		0.97	0.84	1.20		1.00	
Incremental Delay, d2		0.6	0.2	3.3	3.0		3.7	0.3	0.3		0.9	
Delay (s)		49.8	49.2	12.0	11.1		29.0	20.2	26.9		25.5	
Level of Service		D	D	B	B		C	C	C		C	
Approach Delay (s)		49.4			11.6			23.7			25.5	
Approach LOS		D			B			C			C	

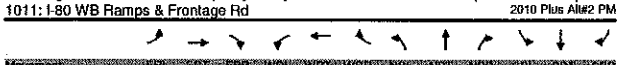
Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	189	37	447	674	209	431
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	199	39	471	709	220	454
RTOR Reduction (vph)	0	23	0	0	0	262
Lane Group Flow (vph)	199	16	471	709	220	192
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7

Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	18.1	45.0	23.4	84.9	58.0	18.1
Effective Green, g (s)	17.6	44.5	22.9	84.4	57.5	17.6
Actuated g/C Ratio	0.16	0.40	0.21	0.77	0.52	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283	640	715	1429	974	253
v/s Ratio Prot	0.11	0.01	c0.14	c0.38	0.12	c0.12
v/s Ratio Perm						
v/c Ratio	0.70	0.02	0.66	0.50	0.23	0.76
Uniform Delay, d1	43.7	19.7	40.0	4.8	14.2	44.2
Progression Factor	0.64	0.07	1.04	0.24	1.00	1.00
Incremental Delay, d2	7.4	0.0	1.9	1.1	0.5	12.3
Delay (s)	35.2	1.3	43.4	2.2	14.7	56.4
Level of Service	D	A	D	A	B	E
Approach Delay (s)	29.6			18.7	42.8	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	27.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1827	
Volume (vph)	172	570	60	612	14	0	11	668	1403	269	556	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	600	63	644	15	0	12	724	1483	283	585	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	600	46	322	337	0	12	724	1483	283	632	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15

Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.3	16.3	16.3	21.2	21.2		1.2	23.6	94.1	17.5	39.9	
Effective Green, g (s)	15.8	15.8	15.8	21.2	21.2		0.7	24.1	94.1	17.0	40.4	
Actuated g/C Ratio	0.17	0.17	0.17	0.23	0.23		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	297	313	266	379	381		13	906	1583	320	784	
v/s Ratio Prot	0.10	c0.21		0.19	0.20		0.01	0.20		0.16	0.35	
v/s Ratio Perm			0.03						c0.94			
v/c Ratio	0.61	1.24	0.17	0.85	0.88		0.92	0.80	0.94	0.88	0.81	
Uniform Delay, d1	36.3	39.1	33.5	34.9	35.3		46.7	32.7	0.0	37.6	23.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	133.4	0.1	15.9	20.8		205.3	4.8	11.9	23.3	5.9	
Delay (s)	38.7	172.5	33.7	50.8	56.0		251.9	37.6	11.9	60.9	29.3	
Level of Service	D	F	C	D	E		F	D	B	E	C	
Approach Delay (s)		120.4			53.5			21.6			39.1	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM Average Control Delay	44.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	4.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0						
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2944	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2944	1399				3433		1583
Volume (vph)	140	403	575	0	522	1867	0	0	0	940	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	1965	0	0	0	989	0	347
RTOR Reduction (vph)	0	228	0	0	223	0	0	0	0	0	0	195
Lane Group Flow (vph)	147	801	0	0	1086	1205	0	0	0	989	0	152
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	6	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.4			43.4	110.0				34.1		34.1
Effective Green, g (s)	20.0	67.4			43.4	110.0				34.6		34.6
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1977			1162	1399				1080		498
v/s Ratio Prot	0.08	0.25			0.37					0.29		0.10
v/s Ratio Perm						c0.86						
v/c Ratio	0.46	0.41			0.99dr	0.86				0.92		0.30
Uniform Delay, d1	40.2	11.0			31.9	0.0				36.3		28.6
Progression Factor	1.00	1.00			0.73	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.9	0.7				11.8		0.3
Delay (s)	40.5	11.6			25.2	0.7				48.1		28.8
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.2			13.5			0.0		43.1		
Approach LOS		B			B			A		D		

Intersection Summary				
HCM Average Control Delay	21.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	81.1%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.93	1.00	0.95	0.91	0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1515	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1515	659			
Volume (vph)	142	1199	0	0	1819	409	571	226	1099	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1262	0	0	1915	431	601	238	1157	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	271	0	80	9	0	0	0
Lane Group Flow (vph)	149	1262	0	0	1915	160	601	736	570	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	58.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	58.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	510	395			
v/s Ratio Prot	0.08	c0.35			c0.41		0.36	0.49	c0.86			
v/s Ratio Perm						0.12						
v/c Ratio	0.44	0.85			1.14	0.33	1.06	1.44	1.70			
Uniform Delay, d1	39.3	28.8			35.0	25.3	36.5	36.5	27.0			
Progression Factor	1.55	0.37			0.97	1.72	1.00	1.00	1.00			
Incremental Delay, d2	2.6	4.0			84.4	0.8	56.9	210.6	328.4			
Delay (s)	63.7	14.7			98.3	44.2	92.4	247.1	355.4			
Level of Service	E	B			F	D	F	F	F			
Approach Delay (s)		19.9			89.3			232.0			0.0	
Approach LOS		B			F			F			A	

Intersection Summary				
HCM Average Control Delay	121.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.46			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1806	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3362	1219	1770	3539	1583	1681	1703	1583		1806	2628
Volume (vph)	499	1021	779	325	1174	247	132	16	66	280	163	814
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	525	1075	820	342	1236	260	139	17	69	295	172	857
RTOR Reduction (vph)	0	3	135	0	0	29	0	0	60	0	0	86
Lane Group Flow (vph)	525	1121	685	342	1236	231	78	80	9	0	467	771
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.15	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.26	0.29
v/s Ratio Perm						0.15			0.01			
v/c Ratio	0.99	1.11	1.13	1.25	1.16	0.49	0.36	0.37	0.04		0.95	0.69
Uniform Delay, d1	46.4	38.5	29.5	46.5	38.5	31.6	43.9	44.0	42.1		39.2	25.5
Progression Factor	1.21	1.03	1.09	1.06	1.06	1.12	1.02	1.03	2.10		0.87	0.76
Incremental Delay, d2	9.4	51.6	58.9	133.3	82.2	2.6	0.7	0.7	0.1		26.6	3.0
Delay (s)	65.8	91.3	90.9	182.4	123.1	38.2	45.6	45.8	88.7		60.5	22.4
Level of Service	E	F	F	F	F	D	D	D	F		E	C
Approach Delay (s)		85.6			122.1			58.9			35.9	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	84.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3526			1863	
Volume (vph)	121	156	824	0	0	0	0	1009	29	0	246	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1157	26	0	259	0
RTOR Reduction (vph)	0	0	244	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	93	197	623	0	0	0	0	1182	0	0	259	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.22					c0.34			0.14	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.37					0.57			0.42	
Uniform Delay, d1	25.4	25.4	11.3					14.2			28.9	
Progression Factor	1.26	1.24	2.30					1.00			1.31	
Incremental Delay, d2	0.6	0.3	0.1					1.2			2.1	
Delay (s)	32.6	31.7	25.1					15.3			40.1	
Level of Service	C	C	C					B			D	
Approach Delay (s)		27.6			0.0			15.3			40.1	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	23.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3370		1770	3479		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3370		1770	3479		1770	1846		1770	1863	1539
Volume (vph)	190	612	256	20	703	56	499	510	27	66	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	865	272	21	740	59	525	537	28	72	256	160
RTOR Reduction (vph)	0	27	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1100	0	21	793	0	525	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		4	4		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	947		34	727		677	707		304	320	264
v/s Ratio Prot	0.11	c0.33		0.01	c0.23		0.30	c0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.16		0.62	1.09		0.78	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.5		53.6	43.5		29.8	30.2		39.3	43.7	38.4
Progression Factor	1.26	0.91		1.00	1.00		1.01	1.00		1.24	1.19	2.48
Incremental Delay, d2	147.5	83.7		29.0	61.1		5.4	6.0		0.4	12.3	0.2
Delay (s)	210.6	119.9		82.5	104.8		35.4	36.3		49.0	64.1	95.6
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		133.5			104.0			35.9			72.2	
Approach LOS		F			F			D			E	

Intersection Summary			
HCM Average Control Delay	90.4	HCM Level of Service	F
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3421		1770	3479		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3421		1770	3479		1770	3491		1770	3477	
Volume (vph)	151	674	194	102	473	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	709	204	107	496	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	29	0	0	11	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	884	0	107	549	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.8		8.3	22.4		12.9	32.0		9.9	29.0	
Effective Green, g (s)	9.7	25.3		7.3	22.9		11.9	32.5		8.9	29.5	
Actuated g/C Ratio	0.11	0.28		0.08	0.25		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	962		144	885		234	1261		175	1140	
v/s Ratio Prot	c0.09	c0.26		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.92		0.74	0.62		0.80	1.11		0.67	1.09	
Uniform Delay, d1	39.4	31.3		40.4	29.7		37.9	28.8		39.2	30.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	13.3		18.6	1.4		17.8	61.3		9.8	55.5	
Delay (s)	64.9	44.6		59.0	31.1		55.7	90.1		49.0	85.8	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		47.8			35.6			86.0			82.6	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	69.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3394		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3394		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	868	202	80	673	55	217	132	124	86	182	18
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	893	213	84	708	58	228	139	131	101	192	20
RTOR Reduction (vph)	0	23	0	0	0	34	0	38	0	0	2	0
Lane Group Flow (vph)	27	883	0	84	708	24	228	232	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	38.8		7.6	42.2	42.2	18.1	18.1			21.0	
Effective Green, g (s)	3.7	38.8		7.1	42.2	42.2	17.6	17.6			20.5	
Actuated g/C Ratio	0.04	0.39		0.07	0.42	0.42	0.18	0.18			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1317		126	1493	643	312	298			372	
v/s Ratio Prot	0.02	c0.26		c0.05	c0.20		0.13	c0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.67		0.67	0.47	0.04	0.73	0.78			0.83	
Uniform Delay, d1	47.1	25.3		45.3	20.9	17.0	39.0	39.3			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	2.7		11.4	1.1	0.1	8.0	11.7			14.6	
Delay (s)	50.2	28.0		56.7	22.0	17.1	47.0	51.0			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		28.7			25.1			49.2			52.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3436		1770	3539	1495	1770	1863	1520	1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3436		1770	3539	1495	1770	1863	1520	1770	1825	
Volume (vph)	46	674	126	141	583	207	209	325	133	260	435	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	133	148	614	218	220	342	140	274	458	54
RTOR Reduction (vph)	0	15	0	0	0	134	0	0	100	0	4	0
Lane Group Flow (vph)	48	827	0	148	614	84	220	342	40	274	508	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10						
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.0	32.0		11.9	38.6	38.6	12.5	29.1	29.1	12.5	29.1	
Effective Green, g (s)	4.8	32.0		11.4	38.6	38.6	12.0	28.6	28.6	12.0	28.6	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1100		202	1368	577	212	533	435	212	522	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.12	0.18		c0.15	c0.28	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.75		0.73	0.45	0.15	1.04	0.64	0.09	1.29	0.97	
Uniform Delay, d1	46.6	30.4		42.8	22.8	20.0	44.0	31.2	26.2	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.94	
Incremental Delay, d2	6.8	4.8		12.2	1.1	0.5	72.0	2.9	0.1	159.8	29.8	
Delay (s)	53.4	35.2		55.0	23.9	20.5	116.0	33.6	26.2	201.8	63.2	
Level of Service	D	D		D	C	C	F	C	C	F	E	
Approach Delay (s)		38.2			27.8			57.9			111.5	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM Average Control Delay	55.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	991	44	96	909	12	33	13	98	0	6	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1043	46	101	978	13	35	14	103	0	6	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	991			1089			1817	2305	545	1864	2322	495
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	991			1089			1817	2305	545	1864	2322	495
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	59	79	100	72	98
cM capacity (veh/h)	604			606			92	81	483	21	30	520

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	695	394	101	652	339	41	109	16
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	694	1700	1700	636	1700	1700	92	261	60
Volume to Capacity	0.03	0.41	0.23	0.16	0.38	0.20	1.28	0.42	0.30
Queue Length 95th (ft)	3	0	0	14	0	0	113	49	27
Control Delay (s)	10.4	0.0	0.0	11.7	0.0	0.0	443.0	28.3	88.6
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			141.4		88.6
Approach LOS							F		F

Intersection Summary					
Average Delay	10.2				
Intersection Capacity Utilization	52.6%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

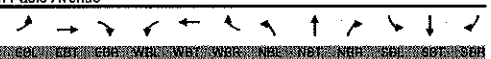
Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3429		1770	3489			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3429		1770	3489			1809	1555		1813	
Volume (vph)	30	941	159	158	846	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	991	167	166	891	60	199	137	301	28	146	20
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1146	0	166	947	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	6.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1221		221	1392			385	331		265	
v/s Ratio Prot	0.02	c0.33		0.09	c0.27			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.94		0.75	0.68			0.87	0.27		0.71	
Uniform Delay, d1	42.9	31.1		42.2	24.8			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.62			1.00	1.00		1.00	
Incremental Delay, d2	0.6	14.7		1.3	0.2			18.9	0.3		8.2	
Delay (s)	43.5	45.9		50.7	15.6			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		45.8			20.8			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary					
HCM Average Control Delay	37.1	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 PM

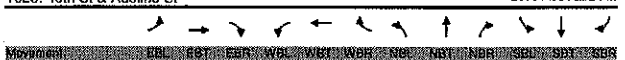


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.93			0.97	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.98		1.00	0.99			1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.95		1.00	0.96			1.00	1.00		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	3296		1770	3371			3433	3531		1770	3479
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	3296		1770	3371			3433	3531		1770	3479
Volume (vph)	207	677	473	47	483	180	481	1203	15	287	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	713	498	49	508	189	506	1266	16	281	1236	107
RTOR Reduction (vph)	0	74	0	0	38	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1032	0	49	659	0	506	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	936		81	640		448	1285		258	1322	
v/s Ratio Prot	c0.12	c0.31		0.03	0.20		0.15	c0.36		0.16	c0.36	
v/s Ratio Perm												
v/c Ratio	0.88	1.10		0.60	1.03		1.13	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.86		1.05	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.4	55.4		7.8	42.0		84.8	24.4		61.9	27.5	
Delay (s)	41.9	96.0		56.8	80.1		128.3	56.2		124.6	58.5	
Level of Service	D	F		E	F		F	E		F	E	
Approach Delay (s)		78.7			76.5			76.6			70.0	
Approach LOS		E			E			E			E	

Intersection Summary					
HCM Average Control Delay	76.4	HCM Level of Service		E	
HCM Volume to Capacity ratio	0.98				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	97.7%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2010 Plus Alt#2 PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.98			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3450			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3450			3117			2416	
Volume (vph)	22	821	17	45	569	97	19	292	107	81	228	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	864	18	47	599	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	21	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	880	0	47	680	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot				Perm			Perm	
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.3	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1904			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.48		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.6		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.24		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.8	0.5			2.0			9.2	
Delay (s)	40.0	9.5		30.0	6.8			20.6			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.3			8.2			20.6			28.5	
Approach LOS		B			A			C			C	

Intersection Summary					
HCM Average Control Delay	14.7	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.56				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳			↟			↟			↟
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	347	89	11	86	103	46	19	83	50	65	59	287
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	365	94	12	91	109	48	20	87	53	68	62	302

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total (vph)	365	105	247	160	433
Volume Left (vph)	365	0	91	20	68
Volume Right (vph)	0	12	48	53	302
Hadj (s)	0.53	0.04	0.01	0.14	-0.35
Departure Headway (s)	7.7	7.1	7.2	7.4	6.4
Degree Utilization, x	0.78	0.21	0.50	0.33	0.77
Capacity (veh/h)	455	489	449	417	433
Control Delay (s)	31.8	10.8	17.2	14.0	27.2
Approach Delay (s)	27.1		17.2	14.0	27.2
Approach LOS	D		C	B	D

Intersection Summary			
Delay	23.7		
HCM Level of Service	C		
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↳			↰	↱		↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.98	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.8			12.4			10.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑			↰↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	352	32	121	216	98	0	1429	92	0	1600	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	949	34	127	227	98	0	1504	97	0	1579	106
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1597	0	0	1681	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.81			0.85	
Uniform Delay, d1		43.5			42.5			18.5			19.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.7			4.9	
Delay (s)		109.8			47.1			22.2			24.3	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.2			24.3	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑			↰↑	↱		↰↑			↑↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.77			1.00	
Satd. Flow (perm)					3514	1583		2710			5075	
Volume (vph)	0	0	0	64	385	732	49	990	0	0	1518	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1042	0	0	1598	22
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	691	0	1094	0	0	1618	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1064	475		1656			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.40				
v/c Ratio					0.45	1.46		0.66			0.52	
Uniform Delay, d1					25.5	31.5		11.4			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	216.3		2.1			0.6	
Delay (s)					25.6	247.8		13.5			10.6	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			163.4			13.5			10.6	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM Average Control Delay	59.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3499		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3499		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	957	78	749	870	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1007	82	788	916	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1084	0	788	916	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1323		899	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.82		0.88	0.38	
Uniform Delay, d1		40.4						30.8		39.2	7.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						5.8		10.3	0.0	
Delay (s)		60.4						36.6		49.5	7.9	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			36.6			27.2	
Approach LOS		E			A			D			C	

Intersection Summary				
HCM Average Control Delay	37.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	93.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christle Ave

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	105	12	1	0	3	135	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	147	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	403	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			282	255	13	403	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	86	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1067	453	603	1068

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	160	12
Volume Left	0	114	0	1
Volume Right	0	1	147	3
cSH	1604	1605	1059	661
Volume to Capacity	0.00	0.07	0.14	0.02
Queue Length 95th (ft)	0	6	12	1
Control Delay (s)	0.0	6.7	9.0	10.5
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.0	10.5
Approach LOS			A	B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.91			0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1702			1777		1770	1834	
Flt Permitted	0.64	1.00		0.72	1.00			0.99		0.22	1.00	
Satd. Flow (perm)	1184	1802		1332	1702			1762		417	1834	
Volume (vph)	70	46	13	135	67	91	13	439	229	83	339	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	50	14	147	73	99	14	477	248	90	362	42
RTOR Reduction (vph)	0	10	0	0	68	0	0	32	0	0	8	0
Lane Group Flow (vph)	76	54	0	147	104	0	0	707	0	90	396	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6		8			7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	18.6	18.6		18.6	18.6			26.2		33.4	33.4	
Effective Green, g (s)	18.6	18.6		18.6	18.6			26.2		33.4	33.4	
Actuated g/C Ratio	0.31	0.31		0.31	0.31			0.44		0.56	0.56	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	367	559		413	528			769		304	1021	
v/s Ratio Prot		0.03			0.06					0.02	c0.22	
v/s Ratio Perm	0.06			c0.11				c0.40		0.15		
v/c Ratio	0.21	0.10		0.36	0.20			0.92		0.30	0.39	
Uniform Delay, d1	15.3	14.7		16.1	15.2			15.9		9.2	7.5	
Progression Factor	1.00	1.00		1.15	1.30			1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.3		2.4	0.8			15.9		0.5	0.2	
Delay (s)	16.5	15.1		20.8	20.5			31.8		9.8	7.8	
Level of Service	B	B		C	C			C		A	A	
Approach Delay (s)		15.9			20.7			31.8			8.1	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Alt#2 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.97		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1808		1770	1863	1746	
Flt Permitted	1.00		0.95	1.00	0.96	
Satd. Flow (perm)	1808		1770	1863	1746	
Volume (vph)	93	23	39	80	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	25	42	87	65	14
RTOR Reduction (vph)	8	0	0	0	13	0
Lane Group Flow (vph)	107	0	42	87	66	0
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	39.7		3.1	46.8	5.2	
Effective Green, g (s)	39.7		3.1	46.8	5.2	
Actuated g/C Ratio	0.66		0.05	0.78	0.09	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1196		91	1453	151	
v/s Ratio Prot	c0.06		c0.02	0.05	c0.04	
v/s Ratio Perm						
v/c Ratio	0.09		0.46	0.06	0.44	
Uniform Delay, d1	3.6		27.6	1.5	26.0	
Progression Factor	0.77		1.00	1.00	1.00	
Incremental Delay, d2	0.1		3.7	0.1	2.0	
Delay (s)	2.9		31.3	1.6	28.0	
Level of Service	A		C	A	C	
Approach Delay (s)	2.9			11.3	28.0	
Approach LOS	A			B	C	

Intersection Summary				
HCM Average Control Delay	12.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.15			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	19.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	119	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	129	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	227	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hdwy (s)	0.49	0.10	0.21	0.04
Departure Headway (s)	4.3	4.7	4.1	4.5
Degree Utilization, x	0.02	0.15	0.26	0.12
Capacity (veh/h)	763	708	843	760
Control Delay (s)	7.4	8.5	8.6	8.1
Approach Delay (s)	7.4	8.5	8.6	8.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.4		
HCM Level of Service	A		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	66	23	12	657	407	83
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	25	13	714	442	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					627	
pX, platoon unblocked	0.97	0.97	0.97			
vC, conflicting volume	1228	486	533			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1234	474	520			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	96	99			
cM capacity (veh/h)	188	575	1019			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	97	13	714	533
Volume Left	72	13	0	0
Volume Right	25	0	0	90
cSH	227	1019	1700	1700
Volume to Capacity	0.43	0.01	0.42	0.31
Queue Length 95th (ft)	50	1	0	0
Control Delay (s)	32.1	8.6	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	32.1	0.2		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1640		1770	3539	1489		3463	
Flt Permitted		0.97	1.00	0.95	0.97		0.38	1.00	1.00		0.98	
Satd. Flow (perm)		1810	1583	1681	1640		674	3539	1489		3190	
Volume (vph)	31	22	136	761	78	72	151	337	325	25	381	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	827	85	78	164	366	353	27	414	60
RTOR Reduction (vph)	0	0	91	0	7	0	0	0	233	0	9	0
Lane Group Flow (vph)	0	58	57	512	471	0	164	366	120	0	492	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	36.2	36.2		37.8	37.8	37.8		37.8	
Effective Green, g (s)		24.5	24.5	36.2	36.2		37.3	37.3	37.3		37.3	
Actuated g/C Ratio		0.22	0.22	0.33	0.33		0.34	0.34	0.34		0.34	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	553	540		229	1200	505		1082	
v/s Ratio Prot		0.03		c0.30	0.29			0.10				
v/s Ratio Perm			c0.04				c0.24		0.08		0.15	
v/c Ratio		0.14	0.16	0.93	0.87		0.72	0.30	0.24		0.45	
Uniform Delay, d1		34.3	34.5	35.6	34.7		31.7	26.8	26.1		28.4	
Progression Factor		1.00	1.00	0.52	0.50		0.45	0.45	0.22		1.00	
Incremental Delay, d2		0.7	1.0	19.7	13.0		11.0	0.4	0.7		1.4	
Delay (s)		35.1	35.4	38.3	30.5		25.4	12.5	6.4		29.8	
Level of Service		D	D	D	C		C	B	A		C	
Approach Delay (s)		35.3			34.6			12.4			29.8	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2010 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	284	72	655	879	247	271
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	309	78	712	955	268	295
RTOR Reduction (vph)	0	40	0	0	0	22
Lane Group Flow (vph)	309	38	712	955	268	273
Confl. Peds. (#/hr)			1			29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	23.0	54.0	27.8	80.0	48.7	75.2
Effective Green, g (s)	22.5	53.8	27.3	79.6	48.2	74.7
Actuated g/C Ratio	0.20	0.49	0.25	0.72	0.44	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	362	774	852	1346	816	1075
v/s Ratio Prot	c0.17	0.02	c0.21	c0.51	0.14	0.17
v/s Ratio Perm						
v/c Ratio	0.85	0.05	0.84	0.71	0.33	0.25
Uniform Delay, d1	42.2	14.7	39.2	8.7	20.3	6.8
Progression Factor	0.56	0.56	0.55	1.98	1.00	1.00
Incremental Delay, d2	16.0	0.0	4.0	1.8	1.1	0.1
Delay (s)	39.6	8.5	25.5	18.0	21.4	7.0
Level of Service	D	A	C	B	C	A
Approach Delay (s)	33.5			21.7	13.8	
Approach LOS	C			C	B	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1835	
Volume (vph)	26	21	7	886	13	16	41	293	1081	135	431	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	963	14	17	45	318	1175	147	468	34
RTOR Reduction (vph)	0	0	9	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	504	489	0	45	318	1175	147	499	0
Confl. Peds. (#/hr)												19
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		6	6		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.2	26.2		3.9	18.5	72.2	6.6	23.2	
Effective Green, g (s)	2.9	2.9	2.9	26.2	26.2		3.4	19.0	72.2	8.1	23.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.36	0.36		0.05	0.26	1.00	0.11	0.33	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	71	75	64	610	610		83	931	1583	199	602	
v/s Ratio Prot	0.02	0.01		0.30	0.29		0.03	0.09		0.08	c0.27	
v/s Ratio Perm			0.00						c0.74			
v/c Ratio	0.39	0.31	0.01	0.83	0.80		0.54	0.34	0.74	0.74	0.83	
Uniform Delay, d1	33.8	33.7	33.3	20.9	20.7		33.6	21.5	0.0	31.0	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	8.8	7.3		3.8	0.2	3.2	11.6	9.1	
Delay (s)	35.1	34.5	33.3	29.7	27.9		37.5	21.7	3.2	42.7	31.4	
Level of Service	D	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.6			28.8			8.0			34.0	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	70.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97	1.00	
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00	1.00	
Frt	1.00	1.00			0.92	0.85				1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1770	3537			3003	1399				3433	1583	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1770	3537			3003	1399				3433	1583	
Volume (vph)	113	281	1	0	359	1313	0	0	0	1093	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1427	0	0	0	1188	0	263
RTOR Reduction (vph)	0	0	0	0	135	0	0	0	0	0	0	138
Lane Group Flow (vph)	123	305	0	0	648	1034	0	0	0	1188	0	125
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						19						1
Turn Type	Prot					Free					custom	custom
Protected Phases	5	2			6							4
Permitted Phases						Free					4	4
Actuated Green, G (s)	11.8	59.1			43.8	110.0					42.4	42.4
Effective Green, g (s)	11.3	59.1			43.8	110.0					42.9	42.9
Actuated g/C Ratio	0.10	0.54			0.40	1.00					0.39	0.39
Clearance Time (s)	3.5	4.0			4.0						4.5	4.5
Vehicle Extension (s)	2.0	4.0			4.0						2.5	2.5
Lane Grp Cap (vph)	182	1900			1198	1399					1339	617
v/s Ratio Prot	0.07	0.09			0.22							0.08
v/s Ratio Perm						c0.74					c0.35	
v/c Ratio	0.68	0.16			0.54	0.74					0.89	0.20
Uniform Delay, d1	47.6	12.9			25.4	0.0					31.3	22.2
Progression Factor	1.00	1.00			0.98	1.00					1.00	1.00
Incremental Delay, d2	7.6	0.2			1.1	2.2					7.4	0.1
Delay (s)	55.2	13.1			26.0	2.2					38.7	22.3
Level of Service	E	B			C	A					D	C
Approach Delay (s)		25.1			12.5			0.0			35.7	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	23.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.93	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	111	1262	0	0	1285	402	396	21	1256	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1372	0	0	1397	437	430	23	1365	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	279	0	161	2	0	0	0
Lane Group Flow (vph)	121	1372	0	0	1397	158	430	544	681	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	632	389			
v/s Ratio Prot	0.07	c0.39			c0.30		0.25	0.38	c1.03			
v/s Ratio Perm						0.11						
v/c Ratio	0.74	1.15			0.83	0.30	0.57	0.86	1.75			
Uniform Delay, d1	48.6	36.5			32.1	25.1	23.3	28.0	22.5			
Progression Factor	1.22	0.60			1.06	2.00	1.00	1.00	1.00			
Incremental Delay, d2	11.0	73.9			3.6	1.0	3.2	14.3	348.7			
Delay (s)	70.4	95.8			37.6	51.4	26.5	42.3	371.2			
Level of Service	E	F			D	D	C	D	F			
Approach Delay (s)		93.7			40.8			162.9			0.0	
Approach LOS		F			D			F			A	

Intersection Summary				
HCM Average Control Delay	99.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.57			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	92.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2010 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.85
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.98	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1820	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1820	2628
Volume (vph)	509	759	1251	350	666	228	227	62	101	294	270	786
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	553	825	1360	380	728	246	247	67	110	264	293	854
RTOR Reduction (vph)	0	120	65	0	0	67	0	0	98	0	0	34
Lane Group Flow (vph)	553	1331	649	380	728	179	153	161	12	0	547	820
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	67	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	85.5	48.0	17.5	82.5	82.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	85.0	47.0	17.0	83.0	83.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.77	0.43	0.15	0.75	0.75	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	189	163		496	1266
v/s Ratio Prot	0.16	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.30	0.31
v/s Ratio Perm						0.12			0.01			
v/c Ratio	0.93	1.35	1.25	1.39	0.69	0.39	0.84	0.85	0.07		1.10	0.65
Uniform Delay, d1	44.9	37.5	31.5	46.5	33.9	30.5	48.0	48.2	44.0		40.0	21.5
Progression Factor	1.24	1.03	1.07	1.00	1.00	1.00	1.26	1.26	2.47		0.81	0.41
Incremental Delay, d2	3.4	157.5	111.8	195.1	3.6	2.5	23.7	26.6	0.1		66.3	1.9
Delay (s)	59.1	195.9	145.4	241.6	37.5	33.0	84.0	87.3	108.7		98.6	10.6
Level of Service	E	F	F	F	D	C	F	F	F		F	B
Approach Delay (s)		154.7			94.0			91.6			45.0	
Approach LOS		F			F			F			D	

Intersection Summary				
HCM Average Control Delay	110.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	111.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2010 Plus All#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1500	21	0	320	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1630	23	0	348	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	198	292	1137	0	0	0	0	1852	0	0	348	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.0	44.5	52.0					58.6			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.47			0.19	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.88			0.41	
Uniform Delay, d1	21.7	21.7	26.3					23.1			19.8	
Progression Factor	1.03	1.03	1.09					0.67			0.68	
Incremental Delay, d2	0.7	0.3	5.7					5.0			1.4	
Delay (s)	22.9	22.7	34.3					18.1			14.8	
Level of Service	C	C	C					B			B	
Approach Delay (s)		31.4			0.0			18.1			14.8	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2010 Plus All#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3346		1770	3508		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3346		1770	3508		1770	1833		1770	1863	1548
Volume (vph)	86	596	303	38	722	96	234	219	22	35	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	650	329	41	785	90	254	238	24	38	250	103
RTOR Reduction (vph)	0	84	0	0	5	0	0	6	0	0	0	82
Lane Group Flow (vph)	93	895	0	41	819	0	254	256	0	38	250	21
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.8		2.2	18.0		12.8	12.8		12.7	12.7	12.7
Effective Green, g (s)	4.0	19.8		2.2	18.0		12.8	12.8		12.7	12.7	12.7
Actuated g/C Ratio	0.06	0.31		0.03	0.28		0.20	0.20		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	111	1043		61	994		357	369		354	373	310
v/s Ratio Prot	c0.05	c0.27		0.02	0.23		c0.14	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.84	0.86		0.67	0.82		0.71	0.69		0.11	0.67	0.07
Uniform Delay, d1	29.4	20.6		30.3	21.3		23.6	23.5		20.8	23.5	20.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.6	7.1		25.4	5.6		5.6	5.6		0.1	4.7	0.1
Delay (s)	69.0	27.7		55.7	26.9		30.2	29.1		20.9	28.1	20.7
Level of Service	E	C		E	C		C	C		C	C	C
Approach Delay (s)		31.3			28.3			29.6			25.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	29.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

2010 Plus All#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3433		1770	3518			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3433		1770	3518			1802	1555		1774	
Volume (vph)	78	1004	164	178	1073	29	140	68	216	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1091	178	193	1166	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	10	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1259	0	193	1197	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.5	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1517		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.37		c0.11	0.34			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.83		0.97	0.63			0.76	0.15		0.22	
Uniform Delay, d1	49.5	24.6		44.3	15.9			39.8	35.7		39.7	
Progression Factor	1.04	0.52		0.81	0.67			1.00	1.00		1.00	
Incremental Delay, d2	216.6	5.1		27.1	0.5			9.9	0.2		0.4	
Delay (s)	268.1	17.8		62.8	11.2			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		21.7			16.2			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

2010 Plus All#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.96		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3072		1770	3359		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3072		1770	3359		3433	3511		1770	3339	
Volume (vph)	167	643	402	72	522	102	547	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	699	437	78	567	111	595	988	27	160	1017	200
RTOR Reduction (vph)	0	96	0	0	16	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1040	0	78	862	0	595	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		5	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.6		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	992		83	816		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.34		0.04	0.26		c0.17	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.05		0.94	0.81		1.08	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.9		47.5	35.7		42.0	29.4		42.9	34.5	
Progression Factor	1.17	0.43		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.9	37.4		77.0	8.6		63.1	6.1		15.0	82.9	
Delay (s)	62.4	51.7		124.5	44.3		105.1	35.5		57.8	117.4	
Level of Service	E	D		F	D		F	D		E	F	
Approach Delay (s)		53.2			52.6			61.2			110.5	
Approach LOS		D			D			E			F	

Intersection Summary				
HCM Average Control Delay	71.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #2
2030

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1001: Ashby (SR 13) & Seventh St — 2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3380		1770	3502		1770	3434		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3380		1770	3502		1770	3434		1770	1863	1583
Volume (vph)	577	881	377	118	778	59	119	266	66	68	273	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	397	124	819	62	125	280	69	72	287	214
RTOR Reduction (vph)	0	41	0	0	5	0	0	20	0	0	0	178
Lane Group Flow (vph)	607	1283	0	124	876	0	125	329	0	72	287	36
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	49.2		11.1	25.3		14.2	14.2		18.5	18.5	18.5
Effective Green, g (s)	35.0	50.2		11.1	26.3		14.2	14.2		18.5	18.5	18.5
Actuated g/C Ratio	0.32	0.46		0.10	0.24		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1543		179	837		228	443		298	313	266
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.15	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.83		0.69	1.05		0.55	0.74		0.24	0.92	0.14
Uniform Delay, d1	37.5	26.2		47.6	41.8		44.9	46.1		39.7	45.0	38.9
Progression Factor	1.00	1.00		0.89	1.19		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.4		5.1	34.3		2.1	6.3		0.4	30.1	0.2
Delay (s)	98.2	31.6		47.6	84.1		47.0	52.4		40.1	75.1	39.2
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		52.5			79.6			51.0			57.3	
Approach LOS		D			E			D			E	

Intersection Summary				
HCM Average Control Delay	59.8	HCM Level of Service		E
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0
Intersection Capacity Utilization	89.8%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1002: Ashby (SR 13) & San Pablo Avenue — 2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3421		1770	3485		1770	3460	
Flt Permitted	0.19	1.00			0.64		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	347	3451			2205		1770	3485		1770	3460	
Volume (vph)	123	746	149	75	602	162	218	785	88	119	886	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	79	634	171	229	826	93	125	933	164
RTOR Reduction (vph)	0	16	0	0	20	0	0	7	0	0	12	0
Lane Group Flow (vph)	129	925	0	0	864	0	229	912	0	125	1085	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	44.6	44.6			44.6		15.7	36.4		16.0	36.7	
Effective Green, g (s)	44.6	44.6			44.6		15.7	37.4		16.0	37.7	
Actuated g/C Ratio	0.41	0.41			0.41		0.14	0.34		0.15	0.34	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	141	1399			894		253	1185		257	1186	
v/s Ratio Prot		0.27					c0.13	0.26		0.07	c0.31	
v/s Ratio Perm	0.37				c0.39							
v/c Ratio	0.91	0.66			0.97		0.91	0.77		0.49	0.91	
Uniform Delay, d1	30.9	26.6			32.0		46.4	32.4		43.2	34.6	
Progression Factor	0.40	0.43			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.0	0.7			22.0		32.4	4.8		1.5	12.3	
Delay (s)	48.5	12.1			54.0		78.8	37.3		44.7	46.9	
Level of Service	D	B			D		E	D		D	D	
Approach Delay (s)		16.5			54.0			45.6			46.7	
Approach LOS		B			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.4	HCM Level of Service		D
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	104.2%	ICU Level of Service		G
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1003: 65th St & Christie Ave — 2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	136	55	1	2	0	89	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	94	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	447	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	447	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			91			100	100	91	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	444	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	96	1
Volume Left	0	145	2	0
Volume Right	2	1	94	0
cSH	1545	1616	1058	520
Volume to Capacity	0.00	0.09	0.09	0.00
Queue Length 95th (ft)	0	7	7	0
Control Delay (s)	0.0	5.5	8.7	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.7	11.9
Approach LOS			A	B

Intersection Summary				
Average Delay	6.4			
Intersection Capacity Utilization	31.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↰	↳		↟			↰	↳
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.99		1.00	0.88		0.96			1.00	0.94
Flt Protected		0.95	1.00		0.95	1.00		1.00			0.95	1.00
Satd. Flow (prot)		1770	1842		1770	1632		1783			1770	1759
Flt Permitted		0.56	1.00		0.71	1.00		0.96			0.36	1.00
Satd. Flow (perm)		1036	1842		1326	1632		1719			664	1759
Volume (vph)	53	61	5	61	47	222	11	123	56	120	258	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	56	64	5	64	49	234	12	129	59	126	272	160
RTOR Reduction (vph)	0	2	0	0	116	0	0	30	0	0	49	0
Lane Group Flow (vph)	56	67	0	65	167	0	0	170	0	126	383	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	30.8	30.8		30.8	30.8			11.3		22.2	22.2	
Effective Green, g (s)	30.3	30.3		30.3	30.3			10.8		21.7	21.7	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.18		0.36	0.36	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	523	930		670	824			309		367	636	
v/s Ratio Prot		0.04			c0.10					0.04	c0.22	
v/s Ratio Perm	0.05			0.08				0.10		0.08		
v/c Ratio	0.11	0.07		0.13	0.20			0.55		0.34	0.60	
Uniform Delay, d1	7.8	7.6		7.9	8.2			22.4		14.1	15.6	
Progression Factor	1.00	1.00		0.52	0.04			1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.4	0.6			2.0		0.6	1.6	
Delay (s)	8.2	7.8		4.4	0.9			24.4		14.6	17.2	
Level of Service	A	A		A	A			C		B	B	
Approach Delay (s)		8.0			1.7			24.4			16.6	
Approach LOS		A			A			C			B	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	66.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↟		↰	↟	↰	↳
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1854		1770	1863	1762	
Flt Permitted	1.00		0.60	1.00	0.96	
Satd. Flow (perm)	1854		1126	1863	1762	
Volume (vph)	228	9	50	181	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	240	9	53	191	178	15
RTOR Reduction (vph)	1	0	0	0	8	0
Lane Group Flow (vph)	248	0	53	191	185	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	43.6		43.6	43.6	9.4	
Effective Green, g (s)	43.1		43.1	43.1	8.9	
Actuated g/C Ratio	0.72		0.72	0.72	0.15	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1332		809	1338	261	
v/s Ratio Prot	c0.13			0.10	c0.11	
v/s Ratio Perm			0.05			
v/c Ratio	0.19		0.07	0.14	0.71	
Uniform Delay, d1	2.7		2.5	2.7	24.3	
Progression Factor	0.67		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.2	0.2	8.8	
Delay (s)	2.7		2.7	2.9	33.1	
Level of Service	A		A	A	C	
Approach Delay (s)	2.7			2.8	33.1	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	11.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	36.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟		↰	↟		↰	↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719			1826		1770	1851		1770	1819	
Flt Permitted		0.91			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1591			1481		1770	1851		1770	1819	
Volume (vph)	64	74	132	37	78	4	38	336	14	23	524	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	67	78	139	39	82	4	38	356	15	24	552	103
RTOR Reduction (vph)	0	69	0	0	2	0	0	2	0	0	11	0
Lane Group Flow (vph)	0	215	0	0	121	0	38	369	0	24	644	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.6			2.6		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		318			296		85	1003		32	931	
v/s Ratio Prot							c0.02	0.20		0.01	c0.35	
v/s Ratio Perm		c0.14			0.08							
v/c Ratio		0.68			0.41		0.45	0.37		0.75	0.69	
Uniform Delay, d1		18.5			17.4		23.2	6.5		24.4	9.2	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		5.1			0.7		2.7	1.0		62.8	4.2	
Delay (s)		23.6			18.1		23.4	8.5		87.2	13.4	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		23.6			18.1			9.0			16.0	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	88	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	93	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	182	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.16	0.01
Departure Headway (s)	4.4	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.21	0.18
Capacity (veh/h)	737	695	849	804
Control Delay (s)	7.5	8.3	8.2	8.3
Approach Delay (s)	7.5	8.3	8.2	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.2			
HCM Level of Service	A			
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	53	19	17	153	328	17
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	56	20	18	161	345	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	551	354	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	551	354	363			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	488	690	1195			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	76	18	181	363
Volume Left	56	18	0	0
Volume Right	20	0	0	18
cSH	529	1195	1700	1700
Volume to Capacity	0.14	0.01	0.09	0.21
Queue Length 95th (ft)	12	1	0	0
Control Delay (s)	12.9	8.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.9	0.6		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1660		1770	3539	1583		3519	
Flt Permitted		0.97	1.00	0.95	0.96		0.54	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1660		1002	3539	1583		3309	
Volume (vph)	39	28	117	358	4	29	60	169	242	17	315	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	377	4	31	63	199	255	18	332	8
RTOR Reduction (vph)	0	0	116	0	7	0	0	0	84	0	2	0
Lane Group Flow (vph)	0	70	7	213	192	0	63	199	171	0	356	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2		6	6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.2	15.2		67.4	67.4	67.4		67.4	
Effective Green, g (s)		5.9	5.9	15.2	15.2		66.9	66.9	66.9		66.9	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	256	252		670	2368	1059		2214	
v/s Ratio Prot		c0.04		c0.13	0.12			0.06				
v/s Ratio Perm			0.00				0.06		c0.11		0.11	
v/c Ratio		0.65	0.08	0.83	0.76		0.09	0.08	0.16		0.16	
Uniform Delay, d1		46.1	44.5	41.2	40.7		5.8	5.8	6.1		6.1	
Progression Factor		1.00	1.00	1.50	1.53		0.06	0.08	0.60		1.00	
Incremental Delay, d2		12.1	0.3	19.6	12.5		0.2	0.1	0.3		0.2	
Delay (s)		58.2	44.7	81.6	74.6		0.6	0.5	4.0		6.3	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6			76.2			2.2			6.3	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	204	39	285	191	131	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	215	40	300	201	138	162
RTOR Reduction (vph)	0	27	0	0	0	135
Lane Group Flow (vph)	215	13	300	201	138	27
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	17.0	33.6	13.1	76.0	58.4	17.0
Effective Green, g (s)	16.5	33.1	12.6	75.5	58.9	16.5
Actuated g/C Ratio	0.18	0.33	0.13	0.76	0.59	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	292	524	433	1407	1097	261
v/s Ratio Prot	c0.12	0.01	c0.09	c0.11	0.07	0.02
v/s Ratio Perm						
v/c Ratio	0.74	0.03	0.69	0.14	0.13	0.10
Uniform Delay, d1	39.7	22.6	41.8	3.4	9.1	35.5
Progression Factor	1.06	3.44	0.90	0.22	1.00	1.00
Incremental Delay, d2	9.1	0.0	4.7	0.2	0.2	0.2
Delay (s)	51.3	77.6	42.2	0.9	9.4	35.8
Level of Service	D	E	D	A	A	D
Approach Delay (s)	55.5			25.7	23.9	
Approach LOS	E			C	C	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1863	1583	1681		1770	3539	1583	1770	1803	
Flt Permitted		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1863	1583	1681		1770	3539	1583	1770	1803	
Volume (vph)	5	21	16	723	79	0	88	105	865	76	260	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	761	83	0	93	111	911	80	274	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	411	433	0	93	111	911	80	339	0
Turn Type	Split			Perm	Split		Prot		Free	Prot		
Protected Phases	7	7			8	8	5	2		1	6	
Permitted Phases				7					Free			
Actuated Green, G (s)	2.9	2.9	2.9	25.0	25.0		4.8	16.5	64.4	4.5	16.2	
Effective Green, g (s)	2.4	2.4	2.4	25.0	25.0		4.3	17.0	64.4	4.0	16.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.07	0.26	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	653	660		118	934	1583	110	468	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	c0.19	
v/s Ratio Perm			0.00						c0.58			
v/c Ratio	0.08	0.32	0.01	0.63	0.66		0.79	0.12	0.58	0.73	0.72	
Uniform Delay, d1	29.9	30.2	29.9	15.9	16.2		29.6	18.0	0.0	29.7	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.7	2.1		26.6	0.0	1.5	18.2	5.1	
Delay (s)	30.1	31.2	29.9	17.6	18.3		56.2	18.1	1.5	47.9	26.9	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.6			17.8			7.7			30.8	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	4.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97	1.00	
Frt	1.00	0.93			1.00	0.85				1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1770	3288			3390	1441				3433	1583	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1770	3288			3390	1441				3433	1583	
Volume (vph)	120	236	211	0	741	1048	0	0	0	842	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1103	0	0	0	886	0	151
RTOR Reduction (vph)	0	84	0	0	0	0	0	0	0	0	0	106
Lane Group Flow (vph)	126	386	0	0	780	1103	0	0	0	886	0	45
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.6	62.0			39.0	100.0				29.5		29.5
Effective Green, g (s)	19.0	62.0			39.0	100.0				30.0		30.0
Actuated g/C Ratio	0.19	0.62			0.39	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2039			1322	1441				1030		475
v/s Ratio Prot	0.07	0.12			0.23					0.26		
v/s Ratio Perm						c0.77						0.03
v/c Ratio	0.38	0.19			0.59	0.77				0.86		0.10
Uniform Delay, d1	35.3	8.2			24.2	0.0				33.0		25.2
Progression Factor	1.00	1.00			0.70	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.8				7.4		0.1
Delay (s)	35.6	8.4			17.7	1.8				40.4		25.3
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.1			8.4			0.0		38.2		
Approach LOS		B			A			A		D		

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.88	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1454	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1454	1504			
Volume (vph)	82	995	0	0	1143	386	646	2	1330	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1047	0	0	1203	406	679	2	1400	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	276	0	76	30	0	0	0
Lane Group Flow (vph)	86	1047	0	0	1203	130	627	658	690	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	553	677			
v/s Ratio Prot	0.05	c0.21			c0.26		0.37	c0.45	c0.46			
v/s Ratio Perm						0.08						
v/c Ratio	0.27	0.44			0.81	0.26	0.98	1.19	1.02			
Uniform Delay, d1	35.3	17.7			31.2	25.2	30.6	31.0	27.5			
Progression Factor	0.71	0.48			0.47	0.26	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.5			3.8	0.9	30.8	102.7	39.4			
Delay (s)	26.8	9.0			18.6	7.5	61.4	133.7	66.8			
Level of Service	C	A			B	A	E	F	E			
Approach Delay (s)		10.4			15.8			88.8			0.0	
Approach LOS		B			B			F			A	

Intersection Summary			
HCM Average Control Delay	46.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1793	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1793	2628
Volume (vph)	390	1601	334	75	843	112	42	3	42	159	45	851
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	390	1601	334	75	843	112	42	3	42	159	45	851
RTOR Reduction (vph)	0	0	145	0	0	20	0	0	39	0	0	194
Lane Group Flow (vph)	390	1601	189	75	843	92	22	23	3	0	204	457
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	7	6	6 7	5	2		7	7		8	8	1 6
Permitted Phases						2			7			
Actuated Green, G (s)	20.5	41.2	52.2	6.8	26.5	26.5	7.5	7.5	7.5		30.5	51.0
Effective Green, g (s)	20.0	40.7	51.7	6.3	27.0	27.0	7.0	7.0	7.0		30.0	50.0
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	687	1380	745	112	958	427	118	119	111		538	1314
v/s Ratio Prot	0.11	c0.47	c0.13	0.04	c0.24		0.01	0.01			c0.11	0.17
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.57	1.16	0.25	0.67	0.88	0.22	0.19	0.19	0.03		0.38	0.35
Uniform Delay, d1	36.1	29.6	13.4	46.8	35.0	28.3	43.8	43.8	43.3		27.6	15.1
Progression Factor	1.00	0.61	0.37	1.00	1.00	1.00	1.00	1.00	1.00		1.23	1.04
Incremental Delay, d2	1.9	77.0	0.1	11.2	11.5	1.2	0.6	0.6	0.1		1.8	0.6
Delay (s)	41.1	95.0	5.0	57.0	46.5	29.5	44.4	44.4	43.4		35.7	16.3
Level of Service	D	F	A	E	D	C	D	D	D		D	B
Approach Delay (s)		73.1			45.4			43.9			21.0	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM Average Control Delay	55.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.86					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.96	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.96	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	221	0	0	0	0	485	9	0	171	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	511	9	0	180	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	519	0	0	180	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.15			0.10	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.23			0.17	
Uniform Delay, d1	26.8	26.8	21.1					7.4			10.7	
Progression Factor	0.99	0.99	0.89					1.00			1.07	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.4	
Delay (s)	26.7	26.4	18.9					7.6			11.8	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.0			0.0			7.6			11.8	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3342		1770	3484		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3342		1770	3484		1770	1839		1770	1863	1583
Volume (vph)	405	486	267	36	538	63	296	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	512	302	38	566	66	312	286	27	32	306	115
RTOR Reduction (vph)	0	76	0	0	9	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	738	0	38	623	0	312	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	22.0	38.8		5.7	22.5		21.0	21.0		19.5	19.5	19.5
Effective Green, g (s)	21.5	39.3		5.2	23.0		20.5	20.5		19.0	19.0	19.0
Actuated g/C Ratio	0.22	0.39		0.05	0.23		0.20	0.20		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	381	1313		92	801		363	377		336	354	301
v/s Ratio Prot	c0.24	0.22		0.02	c0.18		c0.18	0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.12	0.56		0.41	0.78		0.86	0.82		0.10	0.86	0.07
Uniform Delay, d1	39.2	23.6		45.9	36.1		38.4	38.0		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.02	1.02		0.75	0.80	1.33
Incremental Delay, d2	82.1	1.7		3.0	7.3		17.9	13.4		0.1	17.7	0.1
Delay (s)	121.4	25.4		48.9	43.4		56.8	52.0		25.2	49.1	44.2
Level of Service	F	C		D	D		E	D		C	D	D
Approach Delay (s)		58.4			43.7			54.4			46.2	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	52.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	84.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3383		1770	3518		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3383		1770	3518		1770	3497		1770	3487	
Volume (vph)	103	306	127	105	514	22	125	706	62	49	892	88
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	322	134	111	541	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	50	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	406	0	111	561	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.1		10.8	20.9		12.5	45.9		7.2	43.6	
Effective Green, g (s)	7.0	18.6		9.8	21.4		11.5	49.4		6.2	44.1	
Actuated g/C Ratio	0.07	0.19		0.10	0.21		0.12	0.49		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	629		173	763		204	1728		110	1538	
v/s Ratio Prot	c0.06	0.12		0.06	c0.16		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.65		0.64	0.74		0.65	0.46		0.47	0.67	
Uniform Delay, d1	46.1	37.7		43.4	36.7		42.3	16.6		45.3	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.3		7.9	4.0		6.9	0.9		3.2	2.4	
Delay (s)	90.2	39.9		51.3	40.8		49.2	17.5		48.5	24.6	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.6			42.5			22.0			25.7	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	32.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3432		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3432		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	290	79	83	405	324	74	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	305	77	87	426	341	78	395	45	101	151	9
RTOR Reduction (vph)	0	19	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	363	0	87	426	129	78	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			16.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			16.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1133		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.04	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.32		0.67	0.32	0.22	0.17	0.93			0.78	
Uniform Delay, d1	48.1	25.1		45.2	22.1	21.1	29.0	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.7		11.9	0.6	0.8	0.1	25.3			11.1	
Delay (s)	60.4	25.8		57.1	22.7	21.9	29.2	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.0			25.9			56.8			50.1	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM Average Control Delay	37.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3459		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3459		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	64	57	770	208	130	330	40	160	251	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	67	60	811	219	137	347	42	168	264	11
RTOR Reduction (vph)	0	12	0	0	0	116	0	0	32	0	2	0
Lane Group Flow (vph)	29	429	0	60	811	103	137	347	11	168	273	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.4		7.1	47.0	47.0	12.0	25.5	25.5	8.5	22.0	
Effective Green, g (s)	4.0	44.4		6.6	47.0	47.0	11.5	25.0	25.0	8.0	21.5	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.22	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1538		117	1663	744	204	466	396	142	398	
v/s Ratio Prot	0.02	0.12		c0.03	c0.23		0.08	c0.19		c0.09	0.15	
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.14	0.67	0.74	0.03	1.18	0.69	
Uniform Delay, d1	46.8	17.6		45.1	18.2	15.0	42.4	34.6	28.3	46.0	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.85	
Incremental Delay, d2	2.8	0.5		2.8	1.0	0.4	7.7	6.0	0.0	130.2	4.1	
Delay (s)	49.6	18.1		48.0	19.2	15.4	50.1	40.6	28.3	177.0	34.7	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		20.0			20.1			42.1			88.7	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM Average Control Delay	38.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	512	16	80	1011	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	539	17	95	1064	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1089			558			1324	1879	278	1673	1875	545
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1089			556			1324	1879	278	1673	1875	545
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			91			72	78	89	95	95	100
cM capacity (veh/h)	636			1011			99	61	719	42	62	483

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	359	196	95	709	380	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	636	1700	1700	1011	1700	1700	88	385	61
Volume to Capacity	0.04	0.21	0.12	0.09	0.42	0.22	0.38	0.22	0.10
Queue Length 95th (ft)	3	0	0	8	0	0	39	21	8
Control Delay (s)	10.9	0.0	0.0	8.9	0.0	0.0	70.2	17.0	71.0
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			32.3		71.0
Approach LOS							D		F

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	46.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3460		1770	3506			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3460		1770	3506			1810	1583		1408	
Volume (vph)	3	492	86	122	813	54	244	178	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	518	91	128	856	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	597	0	128	909	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.2		11.0	49.3			26.6	26.6		6.8	
Effective Green, g (s)	0.4	39.2		10.5	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.39		0.10	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	5.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1356		186	1728			471	412		117	
v/s Ratio Prot	0.00	c0.17		c0.07	c0.26			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.44		0.69	0.53			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.5		43.2	17.4			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.96	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.0		5.1	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.4		47.5	11.0			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.8			15.5			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	28.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3365		1770	3389		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3365		1770	3389		3433	3535		1770	3509	
Volume (vph)	88	356	174	32	573	225	349	981	8	166	1016	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	375	183	34	603	237	367	1012	8	175	1072	64
RTOR Reduction (vph)	0	60	0	0	36	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	498	0	34	602	0	367	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	29.0		9.2	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	28.0		8.2	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.28		0.08	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	942		145	956		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.53		0.23	0.84		0.76	0.82		0.78	0.95	
Uniform Delay, d1	44.9	30.4		43.0	33.6		41.4	29.5		42.4	32.3	
Progression Factor	1.49	1.43		1.14	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.4		0.3	5.8		6.4	6.1		15.3	17.2	
Delay (s)	80.6	43.8		49.2	41.4		47.8	35.6		57.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		49.6			41.7			38.8			50.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	44.8	HCM Level of Service		D
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	81.8%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3499			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3506		1770	3499			3169			2905	
Volume (vph)	58	450	30	111	727	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	474	32	117	765	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	497	0	117	818	0	0	195	0	0	367	0
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		168	1862			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.23							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.43			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.78	1.24		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.9	0.4		10.8	0.7			0.4			5.2	
Delay (s)	37.2	9.7		32.5	7.7			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.6			10.6			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service		B
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	56.3%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	1.00			0.94			0.95			0.89	
Flt Protected	0.95	1.00			1.00			0.98			0.99	
Satd. Flow (prot)	1770	1854			1738			1728			1644	
Flt Permitted	0.44	1.00			0.98			0.90			0.94	
Satd. Flow (perm)	819	1854			1714			1680			1567	
Volume (vph)	425	58	2	8	83	84	2	1	2	49	4	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	447	61	2	8	87	88	2	1	2	52	4	242
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	184	0
Lane Group Flow (vph)	447	62	0	0	120	0	0	3	0	0	114	0
Turn Type	pm+pt			Perm		Perm			Perm			
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8		2			6			
Actuated Green, G (s)	20.4	20.4			6.5			9.0			9.0	
Effective Green, g (s)	20.4	20.4			6.5			9.0			9.0	
Actuated g/C Ratio	0.55	0.55			0.17			0.24			0.24	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	698	1011			298			380			377	
v/s Ratio Prot	c0.17	0.03										
v/s Ratio Perm	c0.18				0.07			0.00			c0.07	
v/c Ratio	0.64	0.06			0.40			0.01			0.30	
Uniform Delay, d1	5.9	4.0			13.7			10.8			11.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.0	0.0			0.9			0.0			0.5	
Delay (s)	7.9	4.0			14.6			10.8			12.1	
Level of Service	A	A			B			B			B	
Approach Delay (s)		7.4			14.6			10.8			12.1	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	62
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	281	0
Turn Type	Split			Split			Perm	Perm			Perm	
Protected Phases	3	3		4	4			8			2	
Permitted Phases							4	6			2	
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3509			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3509			3494	
Volume (vph)	77	193	12	112	289	20	0	1215	72	0	1123	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1279	76	0	1182	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1351	0	0	1287	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2045			2037	
v/s Ratio Prot					c0.13			c0.39			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.66			0.63	
Uniform Delay, d1		44.0			41.9			14.9			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.7			1.5	
Delay (s)		57.5			47.6			16.6			16.0	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.6			16.0	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3254			5077	
Volume (vph)	0	0	0	65	656	814	12	624	0	0	1169	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	657	0	0	1231	13
RTOR Reduction (vph)	0	0	0	0	0	144	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	713	0	670	0	0	1243	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1790			2792	
v/s Ratio Prot					0.22						c0.24	
v/s Ratio Perm						c0.45		0.21				
v/c Ratio					0.58	1.22		0.37			0.45	
Uniform Delay, d1					25.3	31.5		12.7			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	112.3		0.6			0.5	
Delay (s)					25.7	143.8		13.4			13.9	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			88.3			13.4			13.9	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	47.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						1.00		1.00		
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3496		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3496		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	618	54	532	670	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	651	57	560	705	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	701	0	560	705	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.18	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1513		638	2391	
v/s Ratio Prot		c0.15						c0.20		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.46		0.88	0.29	
Uniform Delay, d1		25.6						14.1		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.0		12.6	0.0	
Delay (s)		28.2						15.1		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.1			20.4	
Approach LOS		C			A			B			C	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			1.00			1.00	
Flt Protected		0.95			1.00			0.95			1.00	
Satd. Flow (prot)		1770			3498			1770			1863	
Flt Permitted		0.95			1.00			0.95			1.00	
Satd. Flow (perm)		1770			3498			1770			1863	
Volume (vph)	300	794	207	148	903	76	205	508	140	151	379	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	218	156	951	80	216	535	147	159	399	533
RTOR Reduction (vph)	0	21	0	0	6	0	0	23	0	0	0	293
Lane Group Flow (vph)	316	1033	0	156	1025	0	216	659	0	159	399	240
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	38.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.18	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1222		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.12	c0.19		0.09	c0.21	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.67	1.06		0.45	1.07	0.76
Uniform Delay, d1	43.5	32.6		47.1	39.6		41.9	45.0		36.7	44.0	41.5
Progression Factor	1.00	1.00		1.18	0.92		0.99	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.3		1.5	25.7		4.0	48.8		0.9	66.4	9.9
Delay (s)	72.8	39.9		57.2	62.1		45.7	94.0		39.6	110.4	51.4
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.5			61.4			82.4			71.3	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM Average Control Delay	63.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3439		1770	3489		1770	3458	
Flt Permitted	0.16	1.00			0.61		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	302	3382			2118		1770	3489		1770	3458	
Volume (vph)	202	684	288	86	702	149	278	1242	129	191	1114	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	91	739	157	294	1307	136	201	1173	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	7	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	973	0	294	1436	0	201	1373	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	132	1476			924		274	1110		241	1037	
v/s Ratio Prot		0.29					0.17	c0.41		0.11	c0.40	
v/s Ratio Perm	c0.70				0.46							
v/c Ratio	1.61	0.66			1.05		1.07	1.29		0.83	1.32	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.09	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	297.2	0.7			44.5		75.1	139.0		21.3	152.5	
Delay (s)	330.8	27.3			75.5		121.6	176.5		67.6	191.0	
Level of Service	F	C			E		F	F		E	F	
Approach Delay (s)		79.6			75.5			167.2			175.3	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM Average Control Delay	133.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	120.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	140	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	147	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type									None			None
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	562	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	562	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	86	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	330	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	151	2
Volume Left	1	197	2	1
Volume Right	0	0	147	0
cSH	1599	1596	1031	381
Volume to Capacity	0.00	0.12	0.15	0.01
Queue Length 95th (ft)	0	11	13	0
Control Delay (s)	0.4	7.0	9.1	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	7.0	9.1	14.5
Approach LOS			A	B

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↰			↟			↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.88			0.95			1.00	
Flt Protected		0.95			1.00			1.00			0.95	
Satd. Flow (prot)		1770			1632			1774			1770	
Flt Permitted		0.19			1.00			0.99			0.20	
Satd. Flow (perm)		348			1303			1761			367	
Volume (vph)	100	79	6	154	106	501	10	427	235	93	343	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	83	6	162	112	527	11	449	247	98	361	116
RTOR Reduction (vph)	0	4	0	0	235	0	0	32	0	0	20	0
Lane Group Flow (vph)	105	85	0	162	404	0	0	675	0	98	457	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	21.9	21.9		21.9	21.9			23.9		31.1	31.1	
Effective Green, g (s)	21.4	21.4		21.4	21.4			23.4		30.6	30.6	
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.39		0.51	0.51	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	124	658		465	582			687		262	915	
v/s Ratio Prot		0.05			0.25					0.02	c0.26	
v/s Ratio Perm	c0.30			0.12				c0.38		0.17		
v/c Ratio	0.85	0.13		0.35	0.69			0.98		0.37	0.50	
Uniform Delay, d1	17.8	13.0		14.2	16.5			18.1		11.0	9.7	
Progression Factor	1.00	1.00		0.88	0.86			1.00		1.00	1.00	
Incremental Delay, d2	47.5	0.4		1.8	6.1			29.7		0.9	0.4	
Delay (s)	65.3	13.4		14.4	20.3			47.8		11.9	10.1	
Level of Service	E	B		B	C			D		B	B	
Approach Delay (s)		41.5			19.1			47.8			10.4	
Approach LOS		D			B			D			B	

Intersection Summary			
HCM Average Control Delay	27.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	115.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↟		↰	↑	↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.89	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	1850		1770	1863	1759	
Flt Permitted	1.00		0.45	1.00	0.96	
Satd. Flow (perm)	1850		831	1863	1759	
Volume (vph)	387	21	37	374	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	407	22	39	394	408	45
RTOR Reduction (vph)	2	0	0	0	8	0
Lane Group Flow (vph)	427	0	39	394	445	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	33.9		33.9	33.9	18.1	
Effective Green, g (s)	33.4		33.4	33.4	18.6	
Actuated g/C Ratio	0.56		0.56	0.56	0.31	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1030		463	1037	545	
v/s Ratio Prot	c0.23			0.21	c0.25	
v/s Ratio Perm			0.05			
v/c Ratio	0.41		0.08	0.38	0.82	
Uniform Delay, d1	7.7		6.2	7.5	19.1	
Progression Factor	0.80		1.00	1.00	1.00	
Incremental Delay, d2	0.9		0.4	1.1	9.2	
Delay (s)	7.0		6.5	8.5	28.3	
Level of Service	A		A	A	C	
Approach Delay (s)	7.0			8.4	28.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟		↰	↑		↰	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.96		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772			1803		1770	1843		1770	1757	
Flt Permitted		0.80			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1449			1569		1770	1843		1770	1757	
Volume (vph)	185	215	66	36	110	20	163	712	44	19	404	181
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	226	72	38	116	21	172	749	46	20	425	191
RTOR Reduction (vph)	0	11	0	0	9	0	0	3	0	0	29	0
Lane Group Flow (vph)	0	482	0	0	166	0	172	792	0	20	587	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		422			456		222	875		29	642	
v/s Ratio Prot							c0.10	c0.43		0.01	0.33	
v/s Ratio Perm		c0.33			0.11							
v/c Ratio		1.14			0.36		0.77	0.90		0.69	0.91	
Uniform Delay, d1		19.5			15.5		23.3	13.3		26.9	16.6	
Progression Factor		1.00			1.00		0.91	1.07		0.98	1.11	
Incremental Delay, d2		88.4			0.4		13.4	13.3		39.3	16.5	
Delay (s)		107.9			15.8		34.7	27.5		65.8	34.9	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		107.9			15.8			28.8			35.9	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	47.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	144	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	152	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	240	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	0.42	0.18	-0.13	0.04
Departure Headway (s)	4.7	5.2	4.6	4.8
Degree Utilization, x	0.11	0.19	0.31	0.26
Capacity (veh/h)	675	628	745	708
Control Delay (s)	8.3	9.5	9.6	9.5
Approach Delay (s)	8.3	9.5	9.6	9.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	55	34	19	608	408	101
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	36	19	640	427	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					884	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1368	481	534			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1162	470	524			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	94	98			
cM capacity (veh/h)	207	582	1021			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	94	19	640	534
Volume Left	58	19	0	0
Volume Right	36	0	0	106
cSH	275	1021	1700	1700
Volume to Capacity	0.34	0.02	0.38	0.31
Queue Length 95th (ft)	36	1	0	0
Control Delay (s)	24.7	8.6	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	24.7	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.96	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1656		1770	3539	1452		3452	
Flt Permitted		0.97	1.00	0.95	0.97		0.38	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1656		704	3539	1452		3209	
Volume (vph)	12	5	95	728	63	53	130	337	161	22	394	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	766	66	56	137	355	169	23	415	71
RTOR Reduction (vph)	0	0	94	0	5	0	0	0	104	0	12	0
Lane Group Flow (vph)	0	18	6	456	427	0	137	355	65	0	497	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split			Perm	Split			Perm		Perm	Perm	
Protected Phases	4	4			8	8		2				6
Permitted Phases				4						2	6	
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	744		270	1358	557		1231	
v/s Ratio Prot		c0.01		c0.27	0.26			0.10				
v/s Ratio Perm			0.00				c0.19		0.04		0.15	
v/c Ratio		0.17	0.06	0.60	0.57		0.51	0.26	0.12		0.40	
Uniform Delay, d1		49.3	49.0	22.9	22.5		25.9	23.2	21.9		24.7	
Progression Factor		1.00	1.00	0.30	0.29		0.95	0.87	1.34		1.00	
Incremental Delay, d2		0.6	0.2	3.0	2.7		5.2	0.4	0.3		1.0	
Delay (s)		49.8	49.2	10.0	9.1		29.7	20.5	29.7		25.7	
Level of Service		D	D	B	A		C	C	C		C	
Approach Delay (s)		49.3			9.6			24.8			25.7	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	147	34	474	652	269	370
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	36	499	686	283	389
RTOR Reduction (vph)	0	21	0	0	0	174
Lane Group Flow (vph)	155	15	499	686	283	215
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	18.5	47.2	26.2	84.5	55.8	18.5
Effective Green, g (s)	18.0	46.7	24.7	84.0	55.3	18.0
Actuated g/C Ratio	0.16	0.42	0.22	0.76	0.50	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	290	672	771	1423	937	259
v/s Ratio Prot	0.09	0.01	c0.15	c0.37	0.15	c0.14
v/s Ratio Perm						
v/c Ratio	0.53	0.02	0.65	0.48	0.30	0.83
Uniform Delay, d1	42.2	18.4	38.7	4.9	16.0	44.5
Progression Factor	0.62	0.25	0.96	0.20	1.00	1.00
Incremental Delay, d2	1.8	0.0	1.6	1.0	0.8	19.7
Delay (s)	28.1	4.6	38.6	2.0	16.9	64.2
Level of Service	C	A	D	A	B	E
Approach Delay (s)	23.6			17.4	44.3	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1863	1563	1681		1770	3539	1583	1770	1829	
Flt Permitted		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1863	1583	1681		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	565	14	0	11	721	1406	269	588	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	595	15	0	12	759	1480	283	619	49
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	46	288	312	0	12	759	1480	283	666	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split			Perm	Split			Prot		Free	Prot	
Protected Phases	7	7			8	8		5	2		1	6
Permitted Phases				7						Free		
Actuated Green, G (s)	16.3	16.3	16.3	20.1	20.1		1.2	24.1	93.4	17.4	40.3	
Effective Green, g (s)	15.8	15.8	15.8	20.1	20.1		0.7	24.6	93.4	16.9	40.8	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	299	315	268	362	363		13	932	1583	320	799	
v/s Ratio Prot	0.10	c0.21		0.18	0.18		0.01	0.21		0.16	0.36	
v/s Ratio Perm			0.03						c0.93			
v/c Ratio	0.61	1.23	0.17	0.82	0.86		0.92	0.81	0.93	0.88	0.83	
Uniform Delay, d1	35.9	38.8	33.2	35.0	35.3		46.3	32.3	0.0	37.3	23.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	130.1	0.1	13.7	17.8		205.3	5.4	11.7	23.3	7.3	
Delay (s)	38.3	168.9	33.3	48.7	53.1		251.6	37.7	11.7	60.6	30.6	
Level of Service	D	F	C	D	D		F	D	B	E	C	
Approach Delay (s)		116.1			50.9			21.7			39.5	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM Average Control Delay	43.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	93.4	Sum of lost time (s)	4.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2964	1399				3433		1563
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2964	1399				3433		1563
Volume (vph)	142	429	603	0	568	1895	0	0	0	912	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	598	1995	0	0	0	960	0	361
RTOR Reduction (vph)	0	220	0	0	198	0	0	0	0	0	0	211
Lane Group Flow (vph)	149	867	0	0	1144	1262	0	0	0	960	0	150
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	66.1			44.1	110.0				33.4		33.4
Effective Green, g (s)	20.0	66.1			44.1	110.0				33.9		33.9
Actuated g/C Ratio	0.18	0.62			0.40	1.00				0.31		0.31
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1999			1188	1399				1058		488
v/s Ratio Prot	0.08	0.27			0.39							0.09
v/s Ratio Perm						c0.89				0.28		
v/c Ratio	0.46	0.43			0.96dr	0.89				0.91		0.31
Uniform Delay, d1	40.2	10.9			32.1	0.0				36.5		29.1
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			3.0	1.0				11.1		0.3
Delay (s)	40.6	11.6			24.5	1.0				47.6		29.3
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.1			13.2			0.0		42.6		
Approach LOS		B			B			A		D		

Intersection Summary				
HCM Average Control Delay	21.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1513	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1513	659			
Volume (vph)	153	1187	0	0	1861	464	603	226	1148	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1187	0	0	1861	464	603	226	1148	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	83	11	0	0	0
Lane Group Flow (vph)	153	1187	0	0	1861	186	603	717	563	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	509	336			
v/s Ratio Prot	0.09	c0.33			c0.40		0.36	0.47	c0.85			
v/s Ratio Perm						0.14						
v/c Ratio	0.45	0.80			1.10	0.38	1.07	1.41	1.68			
Uniform Delay, d1	39.4	27.9			35.0	25.8	36.5	36.5	27.0			
Progression Factor	1.54	0.39			0.96	1.55	1.00	1.00	1.00			
Incremental Delay, d2	2.9	3.0			50.6	0.9	57.1	195.4	318.6			
Delay (s)	63.4	14.0			84.2	40.8	93.6	231.9	345.6			
Level of Service	E	B			F	D	F	F	F			
Approach Delay (s)		19.7			75.5			222.7			0.0	
Approach LOS		B			E			F			A	

Intersection Summary				
HCM Average Control Delay	113.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.44			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00	1.00	*0.83	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.97	1.00	
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583	1808	2628	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.97	1.00	
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583	1808	2628	
Volume (vph)	399	1191	745	325	1274	241	132	16	66	256	163	812
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	399	1191	745	325	1274	241	132	16	66	256	163	812
RTOR Reduction (vph)	0	0	143	0	0	26	0	0	58	0	0	92
Lane Group Flow (vph)	399	1191	602	325	1274	215	72	76	8	0	419	720
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.6	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.12	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.23	0.27
v/s Ratio Perm						0.14			0.01			
v/c Ratio	0.75	1.17	1.07	1.19	1.20	0.45	0.34	0.35	0.04		0.85	0.64
Uniform Delay, d1	44.5	38.5	29.5	46.5	38.5	31.2	43.8	43.8	42.1		37.9	24.9
Progression Factor	1.21	1.00	1.05	1.08	1.08	1.15	1.02	1.02	2.08		0.87	0.72
Incremental Delay, d2	0.9	78.1	33.8	107.9	96.9	2.3	0.7	0.7	0.1		14.7	2.4
Delay (s)	54.7	116.7	64.7	157.8	138.5	38.1	45.5	45.6	87.7		47.6	20.3
Level of Service	D	F	E	F	F	D	D	D	F		D	C
Approach Delay (s)		89.6			128.8			58.5			29.6	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	88.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	788	0	0	0	0	1116	25	0	297	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1175	26	0	313	0
RTOR Reduction (vph)	0	0	186	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	633	0	0	0	0	1200	0	0	313	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			8
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	36.0	36.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2088			610	
v/s Ratio Prot	0.06	0.06	c0.23					c0.34			0.17	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.38					0.58			0.51	
Uniform Delay, d1	25.4	25.4	11.4					14.3			29.9	
Progression Factor	1.23	1.20	1.73					1.00			1.28	
Incremental Delay, d2	0.7	0.3	0.1					1.2			3.0	
Delay (s)	31.8	30.8	19.8					15.5			41.6	
Level of Service	C	C	B					B			D	
Approach Delay (s)		22.8			0.0			15.5			41.6	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	21.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3364		1770	3479		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3364		1770	3479		1770	1849		1770	1863	1540
Volume (vph)	206	851	285	23	744	59	535	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	896	300	24	783	62	563	633	28	73	314	158
RTOR Reduction (vph)	0	29	0	0	6	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1167	0	24	839	0	563	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.6	3.6		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	905		55	727		624	652		357	376	311
v/s Ratio Prot	0.12	c0.35		0.01	c0.24		0.32	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.29		0.44	1.15		0.90	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		33.8	35.6		36.5	42.1	35.8
Progression Factor	1.24	1.04		1.00	1.00		1.08	1.07		1.23	1.18	2.42
Incremental Delay, d2	186.7	137.1		5.5	84.8		15.2	36.6		0.2	13.0	0.1
Delay (s)	248.8	178.9		57.8	128.3		51.6	74.8		46.2	62.8	86.8
Level of Service	F	F		E	F		D	E		D	E	F
Approach Delay (s)		189.6			126.3			64.1			67.4	
Approach LOS		F			F			E			E	

Intersection Summary					
HCM Average Control Delay	121.7	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.05				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	95.3%	ICU Level of Service	F		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3483		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3431		1770	3463		1770	3494		1770	3481	
Volume (vph)	181	737	189	106	517	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	776	199	112	544	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	25	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	950	0	112	598	0	195	1585	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.4		8.4	22.8		13.1	31.3		9.9	28.1	
Effective Green, g (s)	10.0	25.9		7.4	23.3		12.1	31.8		8.9	28.6	
Actuated g/C Ratio	0.11	0.29		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	987		146	902		238	1235		175	1106	
v/s Ratio Prot	c0.11	c0.28		0.06	0.17		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.96		0.77	0.66		0.82	1.28		0.67	1.31	
Uniform Delay, d1	39.8	31.6		40.6	29.8		37.9	29.1		39.2	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	20.0		21.1	1.8		19.3	133.8		9.8	146.4	
Delay (s)	94.5	51.6		61.6	31.7		57.2	162.9		49.0	177.1	
Level of Service	F	D		E	C		E	F		D	F	
Approach Delay (s)		58.6			36.3			151.3			167.5	
Approach LOS		E			D			F			F	

Intersection Summary					
HCM Average Control Delay	119.9	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.12				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	94.8%	ICU Level of Service	F		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	
Satd. Flow (prot)	1770	3400		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	
Satd. Flow (perm)	1770	3400		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	707	204	168	755	107	233	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	744	215	168	795	113	245	362	178	273	418	20
RTOR Reduction (vph)	0	27	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	932	0	168	795	29	245	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		8	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	782		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.27		c0.09	c0.22		0.14	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.19		1.34	0.86	0.07	0.51	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.2	27.8	30.9	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	98.8		196.8	10.3	0.4	0.7	73.9			212.2	
Delay (s)	50.8	137.3		243.3	45.5	28.2	31.6	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		134.5			74.3			85.6			248.7	
Approach LOS		F			E			F			F	

Intersection Summary					
HCM Average Control Delay	128.4	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.30				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0		
Intersection Capacity Utilization	113.3%	ICU Level of Service	H		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00		0.85	1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1770	3460		1770	3539	1494	1770	1863		1520	1770	1834
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1770	3460		1770	3539	1494	1770	1863		1520	1770	1834
Volume (vph)	46	926	129	143	794	233	213	390		133	315	585	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	136	151	836	245	224	411		140	332	616	54
RTOR Reduction (vph)	0	11	0	0	0	151	0	0		99	0	3	0
Lane Group Flow (vph)	48	1102	0	151	836	94	224	411		41	332	667	0
Confl. Peds. (#/hr)			19			12				11			14
Confl. Bikes (#/hr)			2			10				1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.5	29.5	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1090		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.19	c0.36	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	1.01		0.74	0.62	0.16	1.06	0.76	0.09	1.57	1.25	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.4	44.0	32.3	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	6.8	30.0		12.8	2.1	0.8	77.5	6.0	0.1	266.2	122.3	
Delay (s)	53.4	64.3		55.6	27.1	21.0	121.5	38.3	26.0	308.2	156.1	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		63.6			29.4			60.2			206.5	
Approach LOS		E			C			E			F	

Intersection Summary					
HCM Average Control Delay	87.3	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.14				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	97.0%	ICU Level of Service	F		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1300	44	96	1189	13	33	12	98	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1368	46	101	1252	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1265			1415			2279	2905	707	2301	2922	633
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1265			1415			2279	2905	707	2301	2922	633
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			79			0	0	73	0	26	98
cM capacity (veh/h)	546			478			7	12	378	0	11	423

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	912	502	101	834	431	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	546	1700	1700	478	1700	1700	7	134	0
Volume to Capacity	0.04	0.54	0.30	0.21	0.49	0.25	5.82	0.82	Err
Queue Length 95th (ft)	3	0	0	20	0	0	Err	126	Err
Control Delay (s)	11.8	0.0	0.0	14.5	0.0	0.0	Err	97.8	Err
Lane LOS	B			B			F	F	F
Approach Delay (s)	0.2			1.1			2798.2		Err
Approach LOS							F		F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.99			1.00			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	3422		1770	3494			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3422		1770	3494			1814	1555		1814	
Volume (vph)	32	1193	216	158	1023	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1256	227	166	1077	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	13	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1470	0	166	1137	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	6.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	6.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1095		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.43		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.34		0.78	0.91			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	30.5			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.80			1.00	1.00		1.00	
Incremental Delay, d2	0.6	160.3		1.7	1.3			101.1	0.6		10.7	
Delay (s)	43.6	194.3		52.0	19.5			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		191.0			23.8			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary			
HCM Average Control Delay	107.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3310		1770	3391		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3310		1770	3391		3433	3532		1770	3482	
Volume (vph)	223	857	432	47	697	187	533	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	902	455	49	628	197	561	1415	16	298	1511	123
RTOR Reduction (vph)	0	62	0	0	30	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1295	0	49	795	0	561	1430	0	298	1626	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		6.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.36	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	957		81	644		446	1286		250	1306	
v/s Ratio Prot	c0.13	c0.39		0.03	0.23		0.16	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.35		0.60	1.23		1.26	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.61	0.81		0.97	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	159.6		7.5	117.3		133.2	61.8		116.9	117.4	
Delay (s)	30.5	192.1		52.9	156.3		176.7	93.6		161.5	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		168.3			150.5			117.0			150.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	144.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3460			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3460			3110			2395	
Volume (vph)	47	992	17	45	865	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1044	18	47	700	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	19	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1060	0	47	785	0	0	371	0	0	389	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1792			603			465	
v/s Ratio Prot	c0.03	c0.30		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.58		0.58	0.44			0.62			0.82	
Uniform Delay, d1	23.3	8.2		23.4	7.5			18.4			19.3	
Progression Factor	1.03	1.41		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.6			1.9			11.2	
Delay (s)	24.5	11.7		30.0	8.3			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.3			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰			↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00	0.98		0.94			0.96			0.91	
Flt Protected		0.95	1.00		0.99			0.99			0.99	
Satd. Flow (prot)		1770	1833		1734			1768			1669	
Flt Permitted		0.28	1.00		0.87			0.90			0.88	
Satd. Flow (perm)		518	1833		1537			1606			1487	
Volume (vph)	535	95	11	86	105	140	19	63	50	167	59	516
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	563	100	12	91	111	147	20	87	53	176	62	542
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	91	0
Lane Group Flow (vph)	563	107	0	0	320	0	0	140	0	0	689	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8		1			6		
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			732			677	
v/s Ratio Prot	c0.24	0.06										
v/s Ratio Perm					0.21			0.09			c0.46	
v/c Ratio	1.10	0.13			1.10			0.19			1.02	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	68.2	0.1			83.2			0.1			39.1	
Delay (s)	89.4	14.2			119.7			14.7			63.6	
Level of Service	F	B			F			B			E	
Approach Delay (s)		77.0			119.7			14.7			63.6	
Approach LOS		E			F			B			E	

Intersection Summary			
HCM Average Control Delay	74.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	
Frt		1.00	0.94		1.00	0.85		0.97			0.97	
Flt Protected		0.95	1.00		0.97	1.00		0.99			1.00	
Satd. Flow (prot)		1770	1760		1801	1583		1767			1805	
Flt Permitted		0.95	1.00		0.97	1.00		0.87			0.97	
Satd. Flow (perm)		1770	1760		1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	746	0	0	574	0
Turn Type	Split			Split			Perm	Perm			Perm	
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6					
Actuated Green, G (s)	17.6	17.6			8.5	8.5		31.6			31.6	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary			
HCM Average Control Delay	86.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑			↰↑			↰↑			↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	216	38	0	1612	92	0	1811	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1697	97	0	1906	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1790	0	0	2018	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.51			c0.58	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.91			1.02	
Uniform Delay, d1		43.5			42.5			20.6			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			7.6			26.4	
Delay (s)		120.0			47.1			28.1			49.4	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			28.1			49.4	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM Average Control Delay	48.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱		↰↑			↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2546			5077	
Volume (vph)	0	0	0	64	581	603	49	1102	0	0	1829	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	581	845	52	1160	0	0	1925	22
RTOR Reduction (vph)	0	0	0	0	0	61	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	784	0	1212	0	0	1946	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1556			3103	
v/s Ratio Prot					0.19						0.38	
v/s Ratio Perm						c0.50		c0.48				
v/c Ratio					0.62	1.65		0.78			0.63	
Uniform Delay, d1					27.1	31.5		13.0			11.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	302.1		3.9			1.0	
Delay (s)					27.9	333.6		16.9			12.0	
Level of Service					C	F		B			B	
Approach Delay (s)			0.0			199.6			16.9			12.0
Approach LOS			A			F			B			B

Intersection Summary			
HCM Average Control Delay	73.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3503		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3503		3433	3539	
Volume (vph)	26	861	78	0	0	0	0	1069	78	927	1002	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1125	82	976	1055	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1202	0	976	1055	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						39.0		30.0	74.0	
Effective Green, g (s)		26.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.36		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2381	
v/s Ratio Prot		c0.29						c0.34		c0.28	0.30	
v/s Ratio Perm												
v/c Ratio		1.14						0.97		1.01	0.44	
Uniform Delay, d1		41.0						34.9		39.5	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						18.9		31.2	0.0	
Delay (s)		116.5						53.8		70.7	8.4	
Level of Service		F						D		E	A	
Approach Delay (s)		116.5			0.0			53.8			38.4	
Approach LOS		F			A			D			D	

Intersection Summary				
HCM Average Control Delay	61.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	140	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	152	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	487	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	487	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	86	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	399	531	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	155	12
Volume Left	0	153	0	1
Volume Right	0	1	152	3
cSH	1604	1605	1045	582
Volume to Capacity	0.00	0.10	0.15	0.02
Queue Length 95th (ft)	0	8	13	2
Control Delay (s)	0.0	6.9	9.0	11.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.0	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	30.7%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↳		↰	↳			↑↑		↰	↳	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.88			0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1773		1770	1826	
Flt Permitted	0.39	1.00		0.72	1.00			0.99		0.23	1.00	
Satd. Flow (perm)	717	1802		1332	1641			1750		420	1826	
Volume (vph)	75	48	13	135	67	256	13	412	228	90	601	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	50	14	147	73	278	14	448	248	98	545	82
RTOR Reduction (vph)	0	9	0	0	188	0	0	35	0	0	11	0
Lane Group Flow (vph)	82	55	0	147	163	0	0	675	0	98	616	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	19.4	19.4		19.4	19.4			25.4		32.6	32.6	
Effective Green, g (s)	19.4	19.4		19.4	19.4			25.4		32.6	32.6	
Actuated g/C Ratio	0.32	0.32		0.32	0.32			0.42		0.54	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	232	583		431	531			741		300	992	
v/s Ratio Prot		0.03			0.10					0.02	c0.34	
v/s Ratio Perm	c0.11			0.11				c0.39		0.16		
v/c Ratio	0.35	0.09		0.34	0.31			0.91		0.33	0.62	
Uniform Delay, d1	15.5	14.2		15.4	15.2			16.2		9.6	9.4	
Progression Factor	1.00	1.00		0.64	0.28			1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.3		2.1	1.5			15.4		0.6	1.2	
Delay (s)	19.7	14.5		12.0	5.7			31.7		10.3	10.7	
Level of Service	B	B		B	A			C		B	B	
Approach Delay (s)		17.4			7.6			31.7			10.6	
Approach LOS		B			A			C			B	

Intersection Summary				
HCM Average Control Delay	17.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Alt#2 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↳		↰	↑	↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.96		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	1797		1770	1863	1764	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	1797		1770	1863	1764	
Volume (vph)	83	29	43	80	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	32	47	87	245	17
RTOR Reduction (vph)	15	0	0	0	5	0
Lane Group Flow (vph)	107	0	47	87	257	0
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	31.2		3.4	38.6	13.4	
Effective Green, g (s)	31.2		3.4	38.6	13.4	
Actuated g/C Ratio	0.52		0.06	0.64	0.22	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	934		100	1199	394	
v/s Ratio Prot	c0.06		c0.03	0.05	c0.15	
v/s Ratio Perm						
v/c Ratio	0.11		0.47	0.07	0.65	
Uniform Delay, d1	7.4		27.4	4.0	21.2	
Progression Factor	0.54		1.00	1.00	1.00	
Incremental Delay, d2	0.2		3.5	0.1	3.9	
Delay (s)	4.2		30.9	4.1	25.0	
Level of Service	A		C	A	C	
Approach Delay (s)	4.2			13.5	25.0	
Approach LOS	A			B	C	

Intersection Summary				
HCM Average Control Delay	17.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	28.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	124	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	135	92	2	130	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	16	129	233	133								
Volume Left (vph)	0	108	5	2								
Volume Right (vph)	14	18	92	0								
Hadj (s)	0.49	0.11	0.20	0.04								
Departure Headway (s)	4.4	4.9	4.2	4.6								
Degree Utilization, x	0.02	0.17	0.27	0.17								
Capacity (veh/h)	731	687	819	749								
Control Delay (s)	7.5	8.9	8.8	8.5								
Approach Delay (s)	7.5	8.9	8.8	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
HCM Level of Service			A									
Intersection Capacity Utilization			34.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2030 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	66	23	13	630	559	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	25	13	685	608	108
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	1372	661	715			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1460	581	648			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	36	94	98			
cM capacity (veh/h)	113	415	756			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	97	13	685	716		
Volume Left	72	13	0	0		
Volume Right	25	0	0	108		
cSH	139	756	1700	1700		
Volume to Capacity	0.70	0.02	0.40	0.42		
Queue Length 95th (ft)	96	1	0	0		
Control Delay (s)	75.5	9.8	0.0	0.0		
Lane LOS	F	A				
Approach Delay (s)	75.5	0.2		0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			47.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1642		1770	3539	1489		3456	
Flt Permitted		0.97	1.00	0.95	0.97		0.36	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1642		649	3539	1489		3198	
Volume (vph)	31	22	136	807	78	72	143	288	296	25	381	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	877	85	78	155	313	322	27	416	68
RTOR Reduction (vph)	0	0	86	0	6	0	0	0	216	0	11	0
Lane Group Flow (vph)	0	58	62	538	496	0	155	313	106	0	500	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	37.4	37.4		36.6	36.6	36.6		36.6	
Effective Green, g (s)		24.5	24.5	37.4	37.4		36.1	36.1	36.1		36.1	
Actuated g/C Ratio		0.22	0.22	0.34	0.34		0.33	0.33	0.33		0.33	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	572	558		213	1161	489		1050	
v/s Ratio Prot		0.03		c0.32	0.30			0.09				
v/s Ratio Perm			c0.04				c0.24		0.07		0.16	
v/c Ratio		0.14	0.17	0.94	0.89		0.73	0.27	0.22		0.48	
Uniform Delay, d1		34.3	34.6	35.2	34.3		32.6	27.2	26.7		29.4	
Progression Factor		1.00	1.00	0.53	0.51		0.58	0.56	0.22		1.00	
Incremental Delay, d2		0.7	1.1	21.5	14.1		16.0	0.5	0.8		1.5	
Delay (s)		35.1	35.7	40.3	31.7		35.0	16.1	6.6		31.0	
Level of Service		D	D	D	C		C	B	A		C	
Approach Delay (s)		35.5			36.1			16.0			31.0	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM Average Control Delay			28.8		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			79.3%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2030 Plus Alt#2 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	260	67	691	855	355	281
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	73	751	929	386	305
RTOR Reduction (vph)	0	37	0	0	0	20
Lane Group Flow (vph)	283	36	751	929	386	285
Confl. Peds. (#/hr)			1			29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	22.4	54.9	29.0	80.6	46.1	74.0
Effective Green, g (s)	21.9	54.4	28.5	80.1	47.6	73.5
Actuated g/C Ratio	0.20	0.49	0.26	0.73	0.43	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	352	783	889	1357	806	1058
v/s Ratio Prot	c0.16	0.02	c0.22	c0.50	0.21	0.18
v/s Ratio Perm						
v/c Ratio	0.80	0.05	0.84	0.68	0.48	0.27
Uniform Delay, d1	42.0	14.4	38.7	8.1	22.3	7.4
Progression Factor	0.66	0.61	0.54	2.01	1.00	1.00
Incremental Delay, d2	11.5	0.0	4.0	1.5	2.0	0.1
Delay (s)	40.2	8.9	25.0	17.7	24.4	7.5
Level of Service	D	A	C	B	C	A
Approach Delay (s)	33.7		21.0	16.9		
Approach LOS	C		C	B		
Intersection Summary						
HCM Average Control Delay			21.6	HCM Level of Service		C
HCM Volume to Capacity ratio			0.74			
Actuated Cycle Length (s)			110.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			68.2%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1661		1770	3539	1583	1770	1837	
Flt Permitted	0.95	1.00	1.00	0.95	0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1661		1770	3539	1583	1770	1837	
Volume (vph)	26	21	7	792	18	16	41	328	1100	135	469	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	861	14	17	45	357	1196	147	510	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	452	439	0	45	357	1196	147	542	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	6.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	660	
v/s Ratio Prot	0.02	0.01		0.27	0.26		0.03	0.10		0.08	c0.30	
v/s Ratio Perm			0.00						c0.76			
v/c Ratio	0.38	0.30	0.01	0.79	0.77		0.53	0.34	0.76	0.75	0.82	
Uniform Delay, d1	35.2	35.1	34.7	22.5	22.2		35.1	20.7	0.0	32.6	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	7.2	5.9		2.7	0.1	3.4	13.6	7.9	
Delay (s)	36.4	35.9	34.7	29.7	28.1		37.8	20.9	3.4	46.2	29.9	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			28.9			8.3			33.4	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			3045	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			3045	1399				3433		1583
Volume (vph)	115	309	31	0	418	1354	0	0	0	1021	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1483	0	0	0	1110	0	282
RTOR Reduction (vph)	0	6	0	0	105	0	0	0	0	0	0	163
Lane Group Flow (vph)	125	364	0	0	715	1117	0	0	0	1110	0	119
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	61.4			46.0	110.0				40.1		40.1
Effective Green, g (s)	11.4	61.4			46.0	110.0				40.6		40.6
Actuated g/C Ratio	0.10	0.56			0.42	1.00				0.37		0.37
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.6		2.6
Lane Grp Cap (vph)	183	1948			1273	1399				1267		584
v/s Ratio Prot	0.07	0.10			0.23							0.07
v/s Ratio Perm						c0.80				0.32		
v/c Ratio	0.68	0.19			0.56	0.80				0.88		0.20
Uniform Delay, d1	47.6	12.0			24.3	0.0				32.4		23.7
Progression Factor	1.00	1.00			0.87	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.6				7.0		0.1
Delay (s)	55.7	12.2			22.2	2.6				39.4		23.8
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.2			10.9			0.0			36.2	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	123	1200	0	0	1355	455	427	21	1349	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1311	0	0	1473	495	464	23	1466	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	319	0	162	2	0	0	0
Lane Group Flow (vph)	134	1311	0	0	1473	176	464	594	731	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.37			0.32		0.28	0.41	c1.11			
v/s Ratio Perm						0.12						
v/c Ratio	0.77	1.10			0.89	0.34	0.63	0.94	1.88			
Uniform Delay, d1	48.4	36.5			33.4	25.9	24.1	29.6	22.5			
Progression Factor	1.19	0.61			1.09	2.21	1.00	1.00	1.00			
Incremental Delay, d2	14.5	54.1			5.2	1.2	4.1	23.8	405.2			
Delay (s)	72.1	76.4			41.6	58.5	28.2	53.4	427.7			
Level of Service	E	E			D	E	C	D	F			
Approach Delay (s)		76.0			45.8			187.9			0.0	
Approach LOS		E			D			F			A	

Intersection Summary			
HCM Average Control Delay	105.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.96	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1820	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.96	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1820	2628
Volume (vph)	386	946	1230	350	761	227	227	62	101	242	270	826
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	420	1028	1337	380	816	247	247	67	110	263	293	898
RTOR Reduction (vph)	0	50	85	0	0	60	0	0	98	0	0	27
Lane Group Flow (vph)	420	1488	742	380	816	187	153	181	12	0	556	871
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		496	1266
v/s Ratio Prot	0.12	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.31	0.33
v/s Ratio Perm						0.12			0.01			
v/c Ratio	0.71	1.48	1.42	1.39	0.77	0.41	0.84	0.86	0.07		1.12	0.69
Uniform Delay, d1	42.9	37.5	31.5	46.5	35.0	30.7	48.0	48.2	44.0		40.0	22.1
Progression Factor	1.22	1.02	1.04	1.00	1.00	1.00	1.26	1.26	2.47		0.80	0.42
Incremental Delay, d2	0.7	214.9	191.6	195.1	5.3	2.7	23.7	26.6	0.1		72.1	2.1
Delay (s)	53.0	253.1	224.5	241.8	40.4	33.4	84.3	87.3	108.7		104.2	11.4
Level of Service	D	F	F	F	D	C	F	F	F		F	B
Approach Delay (s)		214.4			92.2			91.8			46.9	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	137.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1526	21	0	415	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1859	23	0	451	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1881	0	0	451	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					56.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					56.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.48			0.24	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.90			0.53	
Uniform Delay, d1	21.7	21.7	25.2					23.5			21.2	
Progression Factor	1.03	1.04	1.10					0.56			0.89	
Incremental Delay, d2	0.7	0.3	3.5					5.6			2.2	
Delay (s)	23.1	22.9	31.1					18.8			16.7	
Level of Service	C	C	C					B			B	
Approach Delay (s)		28.9			0.0			18.8			16.7	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	22.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3346		1770	3507		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3345		1770	3507		1770	1839		1770	1863	1549
Volume (vph)	101	678	345	40	735	38	281	288	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	737	375	43	799	41	305	313	24	40	308	107
RTOR Reduction (vph)	0	87	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1025	0	43	835	0	305	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Effective Green, g (s)	4.0	19.6		2.3	17.9		14.5	14.5		14.1	14.1	14.1
Actuated g/C Ratio	0.06	0.29		0.03	0.27		0.22	0.22		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	106	986		61	944		386	401		375	395	328
v/s Ratio Prot	c0.06	c0.31		0.02	0.24		0.17	c0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.04	1.04		0.70	0.89		0.79	0.83		0.11	0.78	0.07
Uniform Delay, d1	31.2	23.4		31.8	23.3		24.6	24.8		21.1	24.7	21.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	97.0	39.3		30.9	9.9		10.5	13.6		0.1	9.4	0.1
Delay (s)	129.2	62.8		62.6	33.2		35.1	38.4		21.2	34.1	21.0
Level of Service	F	E		E	C		D	D		C	C	C
Approach Delay (s)		68.7			34.6			36.8			29.9	
Approach LOS		E			C			D			C	

Intersection Summary				
HCM Average Control Delay	47.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3419		1770	3520			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3419		1770	3520			1809	1555		1785	
Volume (vph)	19	1214	226	175	1299	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1320	246	190	1412	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	2	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1553	0	190	1445	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1227		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.45		0.11	c0.41			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.27		0.97	0.89			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	24.8			37.8	31.0		39.8	
Progression Factor	0.94	0.72		0.81	0.70			1.00	1.00		1.00	
Incremental Delay, d2	237.7	125.8		12.7	0.8			59.1	0.4		0.6	
Delay (s)	284.2	148.8		48.7	18.1			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		150.6			21.7			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	82.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2030 Plus Alt#2 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3084		1770	3393		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3084		1770	3393		3433	3516		1770	3354	
Volume (vph)	192	772	463	72	661	109	610	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	839	503	78	718	118	663	1205	27	170	1276	228
RTOR Reduction (vph)	0	87	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1255	0	78	823	0	663	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		6.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	998		83	805		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.41		0.04	0.24		c0.19	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.26		0.94	1.02		1.21	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.35	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	117.7		77.0	37.5		109.7	25.6		18.3	200.1	
Delay (s)	61.7	126.9		124.5	75.6		151.7	58.1		61.1	234.6	
Level of Service	E	F		F	E		F	E		E	F	
Approach Delay (s)		116.2			79.8			90.8			217.0	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	131.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	113.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #3
BASE YEAR

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3389		1770	3522		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3389		1770	3522		1770	3436		1770	1863	1583
Volume (vph)	500	775	305	102	616	20	87	176	42	59	183	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	332	111	670	22	95	191	46	64	199	202
RTOR Reduction (vph)	0	32	0	0	2	0	0	21	0	0	0	173
Lane Group Flow (vph)	543	1142	0	111	690	0	95	216	0	64	199	29
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	54.9		10.7	31.0		11.5	11.5		15.9	15.9	15.9
Effective Green, g (s)	34.6	55.9		10.7	32.0		11.5	11.5		15.9	15.9	15.9
Actuated g/C Ratio	0.31	0.51		0.10	0.29		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1722		172	1025		185	359		256	269	229
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.05	c0.06		0.04	c0.11	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.66		0.65	0.67		0.51	0.60		0.25	0.74	0.13
Uniform Delay, d1	37.3	20.1		47.8	34.4		46.6	47.1		41.8	45.1	41.0
Progression Factor	1.00	1.00		0.78	1.43		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.0		6.4	2.8		1.8	2.4		0.5	10.2	0.3
Delay (s)	68.8	22.1		43.7	52.0		48.4	49.4		42.3	55.3	41.3
Level of Service	E	C		D	D		D	D		D	E	D
Approach Delay (s)		36.9			50.9			49.1			47.4	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	42.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3458			3445		1770	3491		1770	3467	
Flt Permitted	0.20	1.00			0.64		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	366	3458			2224		1770	3491		1770	3467	
Volume (vph)	70	670	121	55	521	103	130	504	51	113	630	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	60	566	112	141	548	55	123	685	108
RTOR Reduction (vph)	0	16	0	0	16	0	0	6	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	722	0	141	597	0	123	784	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	35.2	35.2			35.2		13.2	46.8		16.0	49.6	
Effective Green, g (s)	35.2	35.2			35.2		13.2	46.8		16.0	49.6	
Actuated g/C Ratio	0.32	0.32			0.32		0.12	0.43		0.15	0.45	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	117	1107			712		212	1465		257	1563	
v/s Ratio Prot		0.24					c0.08	0.17		0.07	c0.23	
v/s Ratio Perm	0.21				c0.32							
v/c Ratio	0.65	0.76			1.01		0.67	0.40		0.48	0.50	
Uniform Delay, d1	32.1	33.6			37.4		46.3	21.9		43.2	21.4	
Progression Factor	0.50	0.56			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	2.5			37.2		7.6	0.8		1.4	1.2	
Delay (s)	25.2	21.2			74.6		53.9	22.7		44.6	22.6	
Level of Service	C	C			E		D	C		D	C	
Approach Delay (s)		21.6			74.6			28.8			25.5	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	36.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	65	1	2	0	86	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	93	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61			5			233	233	4	326	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61			5			233	233	4	326	233	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	91	100	100	100
cM capacity (veh/h)	1542			1616			893	633	1070	550	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	96	1
Volume Left	0	84	2	0
Volume Right	2	1	93	0
cSH	1542	1616	1066	633
Volume to Capacity	0.00	0.05	0.09	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.7
Approach LOS			A	B

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	27.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	66	46	5	78	47	36	11	83	61	105	208	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	50	5	85	51	39	12	90	88	114	226	98

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	72	55	85	90	190	114	324
Volume Left (vph)	72	0	85	0	12	114	0
Volume Right (vph)	0	5	0	39	88	0	98
Hadj (s)	0.53	0.03	0.53	0.27	0.23	0.53	0.19
Departure Headway (s)	7.0	6.5	7.0	6.1	5.8	6.2	5.5
Degree Utilization, x	0.14	0.10	0.16	0.15	0.30	0.20	0.50
Capacity (veh/h)	471	610	479	541	593	554	632
Control Delay (s)	10.0	9.0	10.1	9.1	11.3	9.5	12.6
Approach Delay (s)	9.5		9.6		11.3	11.0	
Approach LOS	A		A		B	B	

Intersection Summary				
Delay	11.0			
HCM Level of Service	B			
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	232	0	0	161	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	252	0	0	175	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			252		427	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			252		427	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1313		584	786

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	252	175	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1313	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.99		1.00	0.99		1.00	0.96	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1717			1818		1770	1850		1770	1631	
Flt Permitted		0.91			0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1587			1410		1770	1850		1770	1631	
Volume (vph)	55	73	132	37	54	4	36	271	13	23	385	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	79	143	40	59	4	39	295	14	25	418	54
RTOR Reduction (vph)	0	74	0	0	3	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	208	0	0	100	0	39	306	0	25	464	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		317			282		85	1003		32	937	
v/s Ratio Prot							c0.02	0.17		0.01	c0.28	
v/s Ratio Perm		c0.13			0.07							
v/c Ratio		0.65			0.35		0.46	0.31		0.78	0.50	
Uniform Delay, d1		18.4			17.2		23.2	6.3		24.5	8.0	
Progression Factor		1.00			1.00		0.80	1.20		1.00	1.00	
Incremental Delay, d2		4.3			0.6		2.8	0.8		72.6	1.9	
Delay (s)		22.7			17.8		23.8	8.4		97.1	9.8	
Level of Service		C			B		C	A		F	A	
Approach Delay (s)		22.7			17.8			10.1			14.2	
Approach LOS		C			B			B			B	

Intersection Summary					
HCM Average Control Delay	15.3	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	53.2%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	85	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	92	36	0	85	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	90	152	90
Volume Left (vph)	2	73	24	0
Volume Right (vph)	7	4	36	5
Hadj (s)	-0.29	0.17	-0.06	0.00
Departure Headway (s)	4.3	4.6	4.2	4.3
Degree Utilization, x	0.01	0.12	0.18	0.11
Capacity (veh/h)	789	732	836	810
Control Delay (s)	7.3	8.2	8.1	7.8
Approach Delay (s)	7.3	8.2	8.1	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.0			
HCM Level of Service	A			
Intersection Capacity Utilization	32.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	48	24	23	144	231	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	26	25	157	251	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	490	264	316			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	490	264	316			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	97	98			
cM capacity (veh/h)	527	756	1244			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	78	25	157	316
Volume Left	52	25	0	0
Volume Right	26	0	0	65
cSH	586	1244	1700	1700
Volume to Capacity	0.13	0.02	0.09	0.19
Queue Length 95th (ft)	11	2	0	0
Control Delay (s)	12.1	8.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.1	1.1	0.0	
Approach LOS	B			

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization		29.0%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.95		1.00	1.00		1.00
Satd. Flow (prot)	3406		3539	1583		3532
Flt Permitted	0.95		1.00	1.00		0.93
Satd. Flow (perm)	3406		3539	1583		3301
Volume (vph)	290	30	337	153	17	372
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	33	366	166	18	404
RTOR Reduction (vph)	8	0	0	90	0	0
Lane Group Flow (vph)	340	0	366	76	0	422
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1566		1628	728		1518
v/s Ratio Prot	c0.10		0.10			
v/s Ratio Perm				0.05		c0.13
v/c Ratio	0.22		0.22	0.10		0.28
Uniform Delay, d1	16.2		16.3	15.3		16.7
Progression Factor	0.43		0.18	0.48		1.00
Incremental Delay, d2	0.3		0.2	0.2		0.5
Delay (s)	7.3		3.1	7.6		17.2
Level of Service	A		A	A		B
Approach Delay (s)	7.3		4.5			17.2
Approach LOS	A		A			B

Intersection Summary				
HCM Average Control Delay		9.4	HCM Level of Service	A
HCM Volume to Capacity ratio		0.25		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		38.7%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	110	15	223	179	89	145
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	242	195	97	158
RTOR Reduction (vph)	0	11	0	0	0	140
Lane Group Flow (vph)	120	5	242	195	97	18
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	12.2	29.8	14.1	80.8	63.2	12.2
Effective Green, g (s)	11.7	29.3	13.6	80.3	62.7	11.7
Actuated g/C Ratio	0.12	0.29	0.14	0.80	0.63	0.12
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	207	464	467	1496	1168	185
v/s Ratio Prot	c0.07	0.00	c0.07	c0.10	0.05	0.01
v/s Ratio Perm						
v/c Ratio	0.58	0.01	0.52	0.13	0.08	0.10
Uniform Delay, d1	41.8	25.1	40.2	2.2	7.3	39.4
Progression Factor	1.02	3.38	1.03	0.11	1.00	1.00
Incremental Delay, d2	3.9	0.0	1.0	0.2	0.1	0.2
Delay (s)	46.7	84.7	42.4	0.4	7.5	39.7
Level of Service	D	F	D	A	A	D
Approach Delay (s)	51.2			23.7	27.4	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay		29.4	HCM Level of Service	C
HCM Volume to Capacity ratio		0.24		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		25.8%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1704		1770	3539	1583	1770	1796	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1704		1770	3539	1583	1770	1796	
Volume (vph)	5	21	16	577	79	0	88	41	706	60	225	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	627	86	0	96	45	767	65	246	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	23	1	347	366	0	96	45	767	65	311	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		3	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.7	2.7	2.7	18.7	18.7		4.5	16.3	57.0	3.8	15.6	
Effective Green, g (s)	2.2	2.2	2.2	18.7	18.7		4.0	16.8	57.0	3.3	16.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.33	0.33		0.07	0.29	1.00	0.06	0.28	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	68	72	61	551	559		124	1043	1583	102	507	
v/s Ratio Prot	0.00	0.01		0.21	c0.21		0.05	0.01		0.04	c0.17	
v/s Ratio Perm			0.00						c0.48			
v/c Ratio	0.07	0.32	0.01	0.63	0.65		0.77	0.04	0.48	0.64	0.61	
Uniform Delay, d1	26.4	26.7	26.4	16.2	16.4		26.1	14.4	0.0	26.3	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.0	2.5		23.5	0.0	1.1	9.2	1.9	
Delay (s)	26.6	27.6	26.4	18.2	18.9		49.5	14.4	1.1	35.5	19.6	
Level of Service	C	C	C	B	B		D	B	A	D	B	
Approach Delay (s)		27.0			18.5			6.8			22.3	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay		14.3	HCM Level of Service	B
HCM Volume to Capacity ratio		0.59		
Actuated Cycle Length (s)		57.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		55.8%	ICU Level of Service	B
Analysis Period (min)		15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	627	0	0	0	675	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	699	0	0	0	734	0	139
RTOR Reduction (vph)	0	68	0	0	0	0	0	0	0	0	0	104
Lane Group Flow (vph)	129	373	0	0	739	699	0	0	0	734	0	35
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.6	66.7			43.7	100.0				24.8		24.8
Effective Green, g (s)	19.0	66.7			43.7	100.0				25.3		25.3
Actuated g/C Ratio	0.19	0.67			0.44	1.00				0.26		0.26
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2196			1481	1441				869		400
v/s Ratio Prot	0.07	0.11			0.22					c0.21		
v/s Ratio Perm						c0.62						0.02
v/c Ratio	0.38	0.17			0.50	0.62				0.84		0.09
Uniform Delay, d1	35.4	6.3			20.3	0.0				35.5		28.5
Progression Factor	1.00	1.00			0.78	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.8	1.3				7.4		0.1
Delay (s)	35.7	6.4			16.7	1.3				42.9		28.6
Level of Service	D	A			B	A				D		C
Approach Delay (s)		13.0			8.2			0.0		40.7		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	18.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1472	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1472	1504			
Volume (vph)	74	818	0	0	918	300	589	2	1059	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	889	0	0	998	326	640	2	1151	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	222	0	85	48	0	0	0
Lane Group Flow (vph)	80	889	0	0	998	104	533	641	576	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	10.6	47.0			32.0	32.0	37.9	37.9	45.0			
Effective Green, g (s)	10.1	47.0			32.0	32.0	37.9	37.9	45.0			
Actuated g/C Ratio	0.10	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	320	2390			1484	507	637	558	677			
v/s Ratio Prot	0.05	c0.17			c0.22		0.32	c0.37	c0.38			
v/s Ratio Perm						0.07						
v/c Ratio	0.25	0.37			0.67	0.21	0.84	0.97	0.85			
Uniform Delay, d1	35.1	17.0			29.5	24.7	28.2	30.5	24.5			
Progression Factor	0.54	0.54			0.61	0.41	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.4			2.1	0.8	9.6	30.2	10.2			
Delay (s)	20.6	9.6			20.2	11.0	37.8	60.7	34.7			
Level of Service	C	A			C	B	D	E	C			
Approach Delay (s)		10.5			17.9			44.9			0.0	
Approach LOS		B			B			D			A	

Intersection Summary				
HCM Average Control Delay	28.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.96	1.00	0.95	0.95	1.00		1.00	0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1801	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1801	2628
Volume (vph)	453	1105	319	45	595	95	42	3	42	98	45	594
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	492	1201	347	49	647	103	46	3	46	107	49	646
RTOR Reduction (vph)	0	0	168	0	0	24	0	0	43	0	0	201
Lane Group Flow (vph)	492	1201	179	49	647	79	24	25	3	0	156	445
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.6	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	958	427	116	117	109		540	1317
v/s Ratio Prot	0.14	c0.35	c0.12	0.03	c0.18		0.01	0.01			0.09	c0.17
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.71	0.87	0.24	0.44	0.68	0.18	0.21	0.21	0.03		0.29	0.34
Uniform Delay, d1	37.3	27.1	13.3	45.1	32.8	28.0	44.0	44.0	43.4		26.8	15.0
Progression Factor	1.15	0.55	0.36	0.76	0.89	0.82	1.00	1.00	1.00		1.16	2.69
Incremental Delay, d2	4.5	5.7	0.1	0.9	3.4	0.8	0.6	0.7	0.1		1.3	0.7
Delay (s)	47.6	20.6	4.9	34.8	25.8	16.3	44.6	44.7	43.5		33.0	41.1
Level of Service	D	C	A	C	C	B	D	D	D		C	D
Approach Delay (s)		24.4			25.4			44.1			39.5	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.86	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3327	2787	1770		1583		3526			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3327	2787	1770		1583		3526			1863	
Volume (vph)	35	26	200	6	0	20	0	364	9	0	109	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	28	217	7	0	22	0	396	10	0	118	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	404	0	0	118	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	5				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1502			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.11			0.06	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.27			0.19	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.6			23.2	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.51	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.4			0.6	
Delay (s)	17.0	17.0	14.7	47.7		47.0		19.0			35.7	
Level of Service	B	B	B	D		D		B			D	
Approach Delay (s)		16.2			47.1			19.0			35.7	
Approach LOS		B			D			B			D	

Intersection Summary				
HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.17			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3327		1770	3469		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3327		1770	3469		1770	1827		1770	1863	1583
Volume (vph)	355	350	234	34	393	60	226	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	380	254	37	427	65	246	188	28	28	153	101
RTOR Reduction (vph)	0	86	0	0	12	0	0	6	0	0	0	86
Lane Group Flow (vph)	386	548	0	37	480	0	246	210	0	28	153	15
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	30.6	47.4		5.7	22.5		18.4	18.4		13.5	13.5	13.5
Effective Green, g (s)	30.1	47.9		5.2	23.0		17.9	17.9		13.0	13.0	13.0
Actuated g/C Ratio	0.30	0.48		0.05	0.23		0.18	0.18		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	533	1594		92	798		317	327		230	242	206
v/s Ratio Prot	c0.22	0.16		0.02	c0.14		c0.14	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.72	0.34		0.40	0.60		0.78	0.64		0.12	0.63	0.08
Uniform Delay, d1	31.2	16.2		45.9	34.4		39.2	38.1		38.5	41.2	38.2
Progression Factor	0.59	0.73		1.00	1.00		0.98	0.97		0.88	0.90	1.15
Incremental Delay, d2	3.0	0.4		2.9	3.3		11.9	4.3		0.2	5.2	0.1
Delay (s)	21.3	12.2		48.8	37.7		50.1	41.4		33.3	42.2	43.6
Level of Service	C	B		D	D		D	D		C	D	D
Approach Delay (s)		15.7			38.5			46.0			41.9	
Approach LOS		B			D			D			D	

Intersection Summary				
HCM Average Control Delay	30.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3364		1770	3509		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3364		1770	3509		1770	3479		1770	3498	
Volume (vph)	68	181	69	69	371	22	103	447	57	40	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	197	97	97	403	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	69	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	225	0	97	422	0	112	541	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	13.6		9.0	16.4		11.4	55.0		7.2	50.8	
Effective Green, g (s)	5.4	14.3		8.0	16.9		10.4	55.5		6.2	51.3	
Actuated g/C Ratio	0.05	0.14		0.08	0.17		0.10	0.56		0.06	0.51	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	481		142	593		184	1931		110	1794	
v/s Ratio Prot	0.04	0.07		c0.05	c0.12		c0.06	0.16		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.47		0.68	0.71		0.61	0.28		0.48	0.39	
Uniform Delay, d1	46.7	39.4		44.8	39.2		42.9	11.7		45.3	14.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.7		12.7	4.0		5.6	0.4		3.3	0.6	
Delay (s)	77.6	40.1		57.5	43.3		48.5	12.1		48.6	15.5	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		47.6			45.9			16.3			17.8	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	29.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3410		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3410		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	171	55	43	301	61	62	53	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	186	60	47	327	66	67	58	33	3	25	10
RTOR Reduction (vph)	0	18	0	0	0	27	0	25	0	0	9	0
Lane Group Flow (vph)	26	228	0	47	327	39	67	66	0	0	28	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	56.3		5.4	58.5	58.5	10.4	10.4			13.4	
Effective Green, g (s)	2.7	56.3		4.9	58.5	58.5	9.9	9.9			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.59	0.58	0.10	0.10			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1920		87	2070	926	175	174			231	
v/s Ratio Prot	0.01	0.07		c0.03	c0.09		c0.04	0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.12		0.54	0.16	0.04	0.38	0.38			0.13	
Uniform Delay, d1	48.0	10.2		46.4	9.5	8.8	42.2	42.2			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	1.0	1.0			0.2	
Delay (s)	57.6	10.4		51.8	9.7	8.9	43.2	43.2			38.7	
Level of Service	E	B		D	A	A	D	D			D	
Approach Delay (s)		14.9			14.0			43.2			38.7	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	32.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3422		1770	3539	1583	1770	1863	1583	1770	1842	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3422		1770	3539	1583	1770	1863	1583	1770	1842	
Volume (vph)	28	152	43	51	372	188	123	222	39	70	123	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	47	55	404	183	134	241	42	76	134	11
RTOR Reduction (vph)	0	20	0	0	0	91	0	0	34	0	3	0
Lane Group Flow (vph)	30	192	0	55	404	92	134	241	0	76	142	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	3	6		5	2		3	8		7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	47.7		7.0	50.1	50.1	11.9	23.1	18.9	7.7	18.8	
Effective Green, g (s)	4.1	47.7		6.5	50.1	50.1	11.4	22.6	18.4	7.2	18.4	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.11	0.23	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1632		115	1773	793	202	421	291	127	339	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.08	c0.13		0.04	0.08	
v/s Ratio Perm						0.06			0.00			
v/c Ratio	0.41	0.12		0.48	0.23	0.12	0.66	0.57	0.03	0.60	0.42	
Uniform Delay, d1	46.8	14.5		45.1	14.1	13.2	42.5	34.4	33.5	45.0	36.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.3	7.2	1.5	0.0	6.2	0.6	
Delay (s)	49.5	14.6		47.4	14.4	13.5	49.6	35.9	33.5	54.6	33.6	
Level of Service	D	B		D	B	B	D	D	C	D	C	
Approach Delay (s)		19.0			16.8			40.1			40.8	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	27.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	219	16	90	565	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	238	17	98	614	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	637			255			804	1132	128	1080	1129	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	637			255			804	1132	128	1080	1129	318
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			89	92	91	98	98	100
cM capacity (veh/h)	943			1307			249	162	899	136	182	677

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	159	97	98	409	228	35	86	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	943	1700	1700	1307	1700	1700	232	681	184
Volume to Capacity	0.03	0.09	0.06	0.07	0.24	0.13	0.15	0.13	0.04
Queue Length 95th (ft)	2	0	0	6	0	0	13	11	3
Control Delay (s)	8.9	0.0	0.0	8.0	0.0	0.0	23.3	11.1	25.3
Lane LOS	A			A			C	B	D
Approach Delay (s)	0.8			1.1			14.8		25.3
Approach LOS							B		D

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	1.00
Satd. Flow (prot)	1770	3500		1770	3486			1812	1583		1809	1568
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	1.00
Satd. Flow (perm)	1770	3500		1770	3486			850	1583		1568	1568
Volume (vph)	3	265	21	89	480	53	85	86	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	288	23	75	522	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	307	0	75	574	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	8		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.48		0.07	0.66			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1726		122	1945			183	340		99	
v/s Ratio Prot	0.00	c0.09		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.18		0.61	0.30			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.1		45.3	11.7			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.04	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.3	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.3		53.2	7.4			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.6			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3391		1770	3373		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3391		1770	3373		3433	3533		1770	3500	
Volume (vph)	92	210	81	29	302	137	239	714	6	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	228	88	32	328	149	260	776	9	147	736	59
RTOR Reduction (vph)	0	47	0	0	56	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	269	0	32	421	0	260	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.8	17.0		9.0	18.0		15.0	47.8		12.4	45.2	
Effective Green, g (s)	7.8	16.8		8.0	17.0		14.0	47.8		11.4	45.2	
Actuated g/C Ratio	0.08	0.17		0.08	0.17		0.14	0.48		0.11	0.46	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	570		142	573		481	1689		202	1582	
v/s Ratio Prot	c0.06	0.08		0.02	c0.12		0.08	c0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.23	0.74		0.54	0.46		0.73	0.50	
Uniform Delay, d1	45.1	37.6		43.1	39.4		40.0	17.5		42.8	19.4	
Progression Factor	1.28	1.26		1.17	1.16		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.8	0.4		0.3	4.1		0.7	0.9		10.5	1.1	
Delay (s)	72.4	47.7		50.8	49.7		40.7	18.4		53.3	20.5	
Level of Service	E	D		D	D		D	B		D	C	
Approach Delay (s)		53.7			49.8			24.0			25.6	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	33.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3489		1770	3485			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.86	
Satd. Flow (perm)	1770	3489		1770	3485			3189			2945	
Volume (vph)	48	281	29	6	397	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	305	32	7	432	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	325	0	7	467	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		8			
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2045		21	1917			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.13							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.24			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.8			18.3			19.3	
Progression Factor	0.53	1.45		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.8	7.0		27.9	6.1			18.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.8			8.5			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	41.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	114	50	2	8	67	26	2	1	2	16	4	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	124	54	2	9	73	28	2	1	2	17	4	99
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	124	57	110	5	121							
Volume Left (vph)	124	0	9	2	17							
Volume Right (vph)	0	2	28	2	99							
Hadj (s)	0.53	0.01	-0.10	0.13	-0.43							
Departure Headway (s)	5.4	4.9	4.4	4.6	4.2							
Degree Utilization, x	0.19	0.08	0.13	0.01	0.14							
Capacity (veh/h)	650	713	782	722	804							
Control Delay (s)	8.4	7.1	8.1	7.6	7.9							
Approach Delay (s)	8.0		8.1	7.6	7.9							
Approach LOS	A		A	A	A							
Intersection Summary												
Delay			8.0									
HCM Level of Service			A									
Intersection Capacity Utilization			26.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.95	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.95	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	126	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	183	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			8			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.18	0.18			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	328	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	
Intersection Summary												
HCM Average Control Delay			23.5		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			45.6		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			36.8%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3458			3427			3504			3479	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3504			3479	
Volume (vph)	51	103	9	77	117	20	0	878	62	0	701	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	954	67	0	762	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1017	0	0	853	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2296	
v/s Ratio Prot					c0.07			c0.29			0.25	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.44			0.37	
Uniform Delay, d1		44.2			44.1			8.6			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.2			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.2			8.5	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM Average Control Delay			15.4		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			47.4%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3534			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3292			5073	
Volume (vph)	0	0	0	85	296	663	12	434	0	0	685	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	472	0	0	745	12
RTOR Reduction (vph)	0	0	0	0	0	244	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	477	0	485	0	0	755	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					31.9	31.9		59.1			59.1	
Effective Green, g (s)					31.9	31.9		60.1			60.1	
Actuated g/C Ratio					0.32	0.32		0.60			0.60	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1119	505		1978			3049	
v/s Ratio Prot					0.11						c0.15	
v/s Ratio Perm						c0.30		0.15				
v/c Ratio					0.35	0.94		0.25			0.25	
Uniform Delay, d1					26.1	33.2		9.3			9.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	26.2		0.3			0.2	
Delay (s)					26.2	59.4		9.6			9.5	
Level of Service					C	E		A			A	
Approach Delay (s)		0.0			47.7			9.6			9.5	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM Average Control Delay			27.6		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			60.1%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↑↑		↰↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3479		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3479		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	428	54	221	497	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	465	59	240	540	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	516	0	240	540	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						39.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1943		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.27		0.48	0.20	
Uniform Delay, d1		28.4						8.0		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.3		0.3	0.0	
Delay (s)		28.7						8.3		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.3			10.2	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰	↑↑		↰	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3444		1770	3504		1770	3422		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3444		1770	3504		1770	3422		1770	1863	1583
Volume (vph)	263	614	134	105	745	52	170	408	116	130	261	461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	286	667	146	114	810	57	185	443	126	141	284	501
RTOR Reduction (vph)	0	16	0	0	4	0	0	24	0	0	0	317
Lane Group Flow (vph)	286	797	0	114	863	0	185	545	0	141	284	184
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.4	42.0		11.5	33.1		19.5	19.5		20.0	20.0	20.0
Effective Green, g (s)	20.4	43.0		11.5	34.1		19.5	19.5		20.0	20.0	20.0
Actuated g/C Ratio	0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	328	1346		185	1086		314	607		322	339	288
v/s Ratio Prot	c0.16	0.23		0.06	c0.25		0.10	c0.16		0.08	c0.15	
v/s Ratio Perm												0.12
v/c Ratio	0.87	0.59		0.62	0.79		0.59	0.90		0.44	0.84	0.64
Uniform Delay, d1	43.5	26.6		47.1	34.7		41.6	44.3		40.0	43.4	41.6
Progression Factor	1.00	1.00		1.33	0.64		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	1.9		4.3	4.4		1.9	13.7		1.0	16.3	4.6
Delay (s)	65.1	28.5		67.1	26.6		43.4	58.2		41.0	59.7	46.2
Level of Service	E	C		E	C		D	E		D	E	D
Approach Delay (s)		36.0			31.2			54.5			49.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑			↑↑		↰	↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3435		1770	3488		1770	3471	
Flt Permitted	0.14	1.00			0.73		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	269	3426			2529		1770	3488		1770	3471	
Volume (vph)	96	588	159	44	608	142	172	909	97	181	798	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	48	661	154	187	988	105	197	867	127
RTOR Reduction (vph)	0	27	0	0	20	0	0	6	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	843	0	187	1087	0	197	985	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	36.9	36.9			36.9		15.2	46.1		15.0	45.9	
Effective Green, g (s)	36.9	36.9			36.9		15.2	46.1		15.0	45.9	
Actuated g/C Ratio	0.34	0.34			0.34		0.14	0.42		0.14	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	90	1149			848		245	1462		241	1448	
v/s Ratio Prot		0.23					0.11	c0.31		c0.11	0.28	
v/s Ratio Perm	c0.39				0.33							
v/c Ratio	1.16	0.68			0.99		0.76	0.74		0.82	0.68	
Uniform Delay, d1	36.6	31.5			36.4		45.7	27.0		46.2	28.1	
Progression Factor	1.00	1.07			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	132.6	1.4			29.3		13.2	3.5		18.9	2.6	
Delay (s)	171.5	35.0			65.7		58.8	30.4		65.1	28.7	
Level of Service	F	C			E		E	C		E	C	
Approach Delay (s)		60.5			65.7			34.6			34.7	
Approach LOS		D			E			C			C	

Intersection Summary				
HCM Average Control Delay	44.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	177	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	192	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	16			21			307	307	21	499	307	16
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			21			307	307	21	499	307	16
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	82	100	100	100
cM capacity (veh/h)	1598			1595			605	556	1057	368	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	196	2
Volume Left	1	133	2	1
Volume Right	0	0	192	0
cSH	1598	1595	1043	443
Volume to Capacity	0.00	0.08	0.19	0.00
Queue Length 95th (ft)	0	7	17	0
Control Delay (s)	0.4	6.6	9.2	13.2
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.6	9.2	13.2
Approach LOS			A	B

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		⇳			↰	↱
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	138	78	6	190	85	106	10	374	259	16	293	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	85	7	207	92	115	11	407	282	17	318	72
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2					
Volume Total (vph)	150	91	207	208	699	17	390					
Volume Left (vph)	150	0	207	0	11	17	0					
Volume Right (vph)	0	7	0	115	282	0	72					
Hadj (s)	0.53	-0.02	0.53	-0.35	-0.20	0.53	-0.09					
Departure Headway (s)	9.2	8.6	8.8	7.9	7.6	8.5	7.9					
Degree Utilization, x	0.38	0.22	0.50	0.46	1.48	0.04	0.85					
Capacity (veh/h)	368	398	396	442	475	415	451					
Control Delay (s)	16.6	12.9	19.2	16.2	246.4	10.6	40.6					
Approach Delay (s)	15.2		17.7		246.4	39.3						
Approach LOS	C		C		F	E						
Intersection Summary												
Delay			113.1									
HCM Level of Service			F									
Intersection Capacity Utilization			72.6%		ICU Level of Service				C			
Analysis Period (min)			15									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	353	0	0	381	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	384	0	0	414	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			384		798	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		798	384
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1175		355	664
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	384	414	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1175	1700			
Volume to Capacity	0.23	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			23.4%	ICU Level of Service		A
Analysis Period (min)			15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇳			⇳		↰	↱		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1763			1803		1770	1843		1770	1741	
Flt Permitted		0.79			0.88		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1421			1600		1770	1843		1770	1741	
Volume (vph)	157	166	66	36	113	20	163	604	39	19	317	147
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	171	180	74	39	123	22	177	657	42	21	345	160
RTOR Reduction (vph)	0	13	0	0	9	0	0	4	0	0	30	0
Lane Group Flow (vph)	0	412	0	0	175	0	177	695	0	21	475	0
Conf. Peds. (#/hr)	14		4	4		14			5			20
Conf. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.0		1.4	19.0	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		413			465		222	875		29	636	
v/s Ratio Prot							c0.10	c0.38		0.01	0.27	
v/s Ratio Perm		c0.29			0.11							
v/c Ratio		1.00			0.38		0.80	0.79		0.72	0.75	
Uniform Delay, d1		19.5			15.5		23.4	12.2		26.9	15.2	
Progression Factor		1.00			1.00		0.90	1.04		0.97	1.09	
Incremental Delay, d2		43.1			0.4		14.6	6.2		53.0	6.9	
Delay (s)		62.5			15.9		35.7	18.9		79.1	23.5	
Level of Service		E			B		D	B		E	C	
Approach Delay (s)		62.5			15.9			22.3			25.7	
Approach LOS		E			B			C			C	
Intersection Summary												
HCM Average Control Delay			31.1		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			84.2%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇳			⇳			⇳			⇳	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	181	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	197	72	5	128	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	84	68	287	135								
Volume Left (vph)	4	57	18	5								
Volume Right (vph)	64	12	72	1								
Hadj (s)	-0.42	0.09	-0.10	0.04								
Departure Headway (s)	4.5	5.1	4.3	4.6								
Degree Utilization, x	0.11	0.10	0.35	0.17								
Capacity (veh/h)	712	642	800	734								
Control Delay (s)	8.1	8.6	9.6	8.6								
Approach Delay (s)	8.1	8.6	9.6	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
HCM Level of Service			A									
Intersection Capacity Utilization			37.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	96	42	28	538	408	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	46	30	585	443	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1135	490	536			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1135	490	536			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	52	92	97			
cM capacity (veh/h)	217	579	1032			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	150	30	585	536
Volume Left	104	30	0	0
Volume Right	46	0	0	92
cSH	268	1032	1700	1700
Volume to Capacity	0.56	0.03	0.34	0.32
Queue Length 95th (ft)	79	2	0	0
Control Delay (s)	34.2	8.6	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	34.2	0.4		0.0
Approach LOS	D			

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	42.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3393		3539	1468		3530
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3393		3539	1468		3256
Volume (vph)	655	57	483	231	24	600
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	712	62	525	251	26	652
RTOR Reduction (vph)	6	0	0	137	0	0
Lane Group Flow (vph)	768	0	525	114	0	678
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1604		1609	676		1460
v/s Ratio Prot	c0.23		0.15			
v/s Ratio Perm				0.08		c0.21
v/c Ratio	0.48		0.33	0.17		0.46
Uniform Delay, d1	19.8		19.2	17.7		20.7
Progression Factor	0.41		0.13	0.10		1.00
Incremental Delay, d2	0.9		0.2	0.2		1.0
Delay (s)	9.0		2.8	2.0		21.7
Level of Service	A		A	A		C
Approach Delay (s)	9.0		2.5			21.7
Approach LOS	A		A			C

Intersection Summary					
HCM Average Control Delay	10.6	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	61.6%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	214	34	472	548	231	240
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	37	513	704	251	261
RTOR Reduction (vph)	0	20	0	0	0	130
Lane Group Flow (vph)	233	17	513	704	251	131
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.7	51.9	28.7	83.3	61.1	19.7
Effective Green, g (s)	19.2	51.4	28.2	82.8	60.6	19.2
Actuated g/C Ratio	0.17	0.47	0.26	0.75	0.55	0.17
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	309	740	880	1402	857	276
v/s Ratio Prot	c0.13	0.01	c0.15	c0.38	0.13	0.08
v/s Ratio Perm						
v/c Ratio	0.75	0.02	0.58	0.50	0.29	0.48
Uniform Delay, d1	43.2	15.8	35.8	5.4	16.5	40.9
Progression Factor	0.49	0.01	0.81	0.38	1.00	1.00
Incremental Delay, d2	9.6	0.0	0.6	1.0	0.9	1.3
Delay (s)	30.7	0.2	22.6	3.1	16.4	42.2
Level of Service	C	A	C	A	B	D
Approach Delay (s)	26.5			11.3	31.0	
Approach LOS	C			B	C	

Intersection Summary					
HCM Average Control Delay	18.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.56				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1826	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1826	
Volume (vph)	172	370	60	497	14	0	11	649	1241	252	528	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	540	15	0	12	705	1349	274	574	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	270	285	0	12	705	1349	274	622	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split			Perm	Split					Prot		Free
Protected Phases	7	7			8	8		5	2		1	6
Permitted Phases				7								Free
Actuated Green, G (s)	16.4	16.4	16.4	16.4	16.4		1.1	22.8	89.7	16.6	38.3	
Effective Green, g (s)	15.9	15.9	15.9	16.4	16.4		0.6	23.3	89.7	16.1	38.8	
Actuated g/C Ratio	0.18	0.18	0.18	0.21	0.21		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	314	330	281	345	347		12	919	1583	318	790	
v/s Ratio Prot	0.11	c0.22		0.16	0.17		0.01	0.20		0.15	0.34	
v/s Ratio Perm			0.03						c0.85			
v/c Ratio	0.60	1.22	0.17	0.78	0.82		1.00	0.77	0.85	0.86	0.79	
Uniform Delay, d1	33.9	36.9	31.3	33.8	34.1		44.6	30.7	0.0	35.7	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	122.6	0.1	10.6	14.1		259.8	3.7	6.0	20.0	5.0	
Delay (s)	36.0	159.5	31.4	44.4	48.2		304.4	34.4	6.0	55.7	26.9	
Level of Service	D	F	C	D	D		F	C	A	E	C	
Approach Delay (s)		111.4			46.3			17.4			35.7	
Approach LOS		F			D			B			D	

Intersection Summary					
HCM Average Control Delay	39.9	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.92				
Actuated Cycle Length (s)	89.7	Sum of lost time (s)		4.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0						
Lane Util. Factor	1.00	0.95			0.91	0.91						
Frpb, ped/bikes	1.00	1.00			0.96	0.97						
Flpb, ped/bikes	1.00	1.00			1.00	1.00						
Frt	1.00	0.91			0.92	0.85						
Flt Protected	0.95	1.00			1.00	1.00						
Satd. Flow (prot)	1770	3225			2977	1399						
Flt Permitted	0.95	1.00			1.00	1.00						
Satd. Flow (perm)	1770	3225			2977	1399						
Volume (vph)	140	994	572	0	521	1662	0	0	0	796	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	622	0	566	1807	0	0	0	865	0	359
RTOR Reduction (vph)	0	217	0	0	178	0	0	0	0	0	0	239
Lane Group Flow (vph)	152	833	0	0	1043	1152	0	0	0	865	0	120
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	70.1			46.1	110.0				31.4		31.4
Effective Green, g (s)	20.0	70.1			46.1	110.0				31.9		31.9
Actuated g/C Ratio	0.18	0.64			0.42	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2055			1248	1399				996		459
v/s Ratio Prot	0.09	0.26			0.35							0.08
v/s Ratio Perm						c0.82				0.25		
v/c Ratio	0.47	0.41			0.84	0.82				0.87		0.26
Uniform Delay, d1	40.3	9.8			28.6	0.0				37.1		30.0
Progression Factor	1.00	1.00			0.64	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			0.7	0.5				8.1		0.2
Delay (s)	40.7	10.4			18.9	0.5				45.1		30.2
Level of Service	D	B			B	A				D		C
Approach Delay (s)		14.2			10.0			0.0		40.8		
Approach LOS		B			A			A		D		

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1525	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1525	659			
Volume (vph)	141	1049	0	0	1693	475	550	226	916	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1140	0	0	1775	516	598	246	996	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	86	13	0	0	0
Lane Group Flow (vph)	153	1140	0	0	1775	253	598	676	485	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot						Perm	Split	custom			
Protected Phases	5	2			6			4	4 41			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	513	336			
v/s Ratio Prot	0.09	c0.32			c0.38			0.36	0.44	c0.74		
v/s Ratio Perm						0.19						
v/c Ratio	0.45	0.77			1.05	0.52	1.06	1.32	1.45			
Uniform Delay, d1	39.4	27.4			35.0	27.4	36.5	36.5	27.0			
Progression Factor	1.55	0.38			0.93	1.18	1.00	1.00	1.00			
Incremental Delay, d2	3.2	2.8			32.0	2.1	54.3	157.6	217.3			
Delay (s)	64.3	13.2			64.7	34.3	90.8	194.1	244.3			
Level of Service	E	B			E	C	F	F	F			
Approach Delay (s)		19.3			57.9			174.1			0.0	
Approach LOS		B			E			F			A	

Intersection Summary			
HCM Average Control Delay	88.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00	1.00	*0.83	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.97	1.00	
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583	1812	2628	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.97	1.00	
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583	1812	2628	
Volume (vph)	530	765	671	259	969	205	132	16	66	211	163	872
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	832	729	282	1075	223	143	17	72	229	177	948
RTOR Reduction (vph)	0	7	140	0	0	29	0	0	63	0	0	85
Lane Group Flow (vph)	576	918	496	282	1075	194	78	82	9	0	406	863
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		494	1123
v/s Ratio Prot	c0.17	0.28	c0.41	0.16	c0.30		0.05	0.05			c0.22	0.33
v/s Ratio Perm						0.12			0.01			
v/c Ratio	1.08	0.92	0.88	1.03	1.01	0.41	0.36	0.38	0.05		0.82	0.77
Uniform Delay, d1	46.5	37.2	26.7	46.5	38.5	30.7	43.9	44.0	42.1		37.5	26.9
Progression Factor	1.24	1.00	1.06	1.00	1.00	1.00	1.02	1.02	2.14		0.76	0.59
Incremental Delay, d2	41.7	1.8	1.6	62.1	30.7	2.6	0.7	0.8	0.1		13.0	4.6
Delay (s)	99.3	39.0	29.9	108.6	69.2	33.3	45.7	45.8	90.1		41.6	20.4
Level of Service	F	D	C	F	E	C	D	D	F		D	C
Approach Delay (s)		52.6			74.2			59.5			26.7	
Approach LOS		D			E			E			C	

Intersection Summary			
HCM Average Control Delay	51.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	849	25	0	265	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	1032	27	0	288	0
RTOR Reduction (vph)	0	0	404	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	369	51	0	7	0	1057	0	0	288	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.6			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.13	c0.03				c0.30			0.15	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.29	0.42		0.07		0.66			0.43	
Uniform Delay, d1	23.1	23.0	18.2	49.2		48.0		23.4			26.8	
Progression Factor	1.23	1.22	3.03	1.00		1.00		1.00			1.55	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		2.2			2.0	
Delay (s)	28.8	28.3	55.1	50.9		48.2		25.5			43.4	
Level of Service	C	C	E	D		D		C			D	
Approach Delay (s)		48.9			49.1			25.5			43.4	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3416		1770	3467		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3416		1770	3467		1770	1843		1770	1863	1537
Volume (vph)	169	664	145	20	573	55	507	419	27	58	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	743	158	22	623	60	551	456	29	63	215	170
RTOR Reduction (vph)	0	18	0	0	6	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	885	0	22	677	0	551	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.8	22.5		46.0	46.0		16.0	16.0	16.0
Effective Green, g (s)	10.0	30.9		2.1	23.0		45.5	45.5		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	960		34	725		732	762		249	263	217
v/s Ratio Prot	c0.10	c0.26		0.01	c0.20		c0.31	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.14	0.92		0.65	0.93		0.75	0.63		0.25	0.82	0.11
Uniform Delay, d1	50.0	38.4		53.6	42.7		27.5	25.6		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.00		1.07	1.04	1.76
Incremental Delay, d2	114.5	15.4		35.3	20.6		4.3	1.7		0.5	16.7	0.2
Delay (s)	164.5	53.8		88.8	63.4		31.4	27.3		46.6	64.3	72.9
Level of Service	F	D		F	E		C	C		D	E	E
Approach Delay (s)		72.6			64.1			29.5			64.9	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3409		1770	3466		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3409		1770	3466		1770	3483		1770	3483	
Volume (vph)	128	574	185	100	378	61	140	978	116	112	866	103
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	624	202	109	411	66	152	1063	126	122	941	112
RTOR Reduction (vph)	0	35	0	0	15	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	791	0	109	462	0	152	1179	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.2		8.4	22.2		11.9	32.4		10.0	30.5	
Effective Green, g (s)	9.4	24.7		7.4	22.7		10.9	32.9		9.0	31.0	
Actuated g/C Ratio	0.10	0.27		0.08	0.25		0.12	0.37		0.10	0.34	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	936		146	874		214	1273		177	1200	
v/s Ratio Prot	c0.08	c0.23		0.06	0.13		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.85		0.75	0.53		0.71	0.93		0.69	0.87	
Uniform Delay, d1	39.2	30.8		40.4	29.0		38.0	27.4		39.1	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	7.1		18.6	0.8		10.6	12.8		10.6	8.7	
Delay (s)	54.9	37.9		59.0	29.6		48.6	40.2		49.8	36.3	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		40.4			35.1			41.2			37.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3382		1770	3539	1524	1770	1685			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3382		1770	3539	1524	1770	1685			1805	
Volume (vph)	24	598	203	80	599	27	215	106	108	42	108	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	649	221	87	651	29	234	115	117	46	115	21
RTOR Reduction (vph)	0	25	0	0	0	15	0	41	0	0	5	0
Lane Group Flow (vph)	26	844	0	87	651	14	234	191	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	44.0		7.9	48.7	48.7	17.9	17.9			15.7	
Effective Green, g (s)	2.7	44.0		7.4	48.7	48.7	17.4	17.4			15.2	
Actuated g/C Ratio	0.03	0.44		0.07	0.49	0.49	0.17	0.17			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1488		131	1723	742	308	293			274	
v/s Ratio Prot	0.01	c0.25		c0.05	0.18		c0.13	0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.57		0.66	0.38	0.02	0.76	0.65			0.65	
Uniform Delay, d1	48.0	20.9		46.1	16.1	13.3	39.3	36.5			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.6		10.8	0.6	0.0	9.8	4.6			4.6	
Delay (s)	57.5	22.6		56.9	16.8	13.3	49.1	43.0			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		23.8			21.1			46.1			44.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1498	1770	1863	1520	1770	1811	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3418		1770	3539	1496	1770	1863	1520	1770	1811	
Volume (vph)	46	544	124	141	498	180	191	275	115	177	303	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	135	153	541	196	208	299	125	192	329	55
RTOR Reduction (vph)	0	18	0	0	0	113	0	0	96	0	6	0
Lane Group Flow (vph)	50	708	0	153	541	83	208	299	29	192	378	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	37.1		12.2	42.6	42.6	12.5	23.8	23.8	12.4	23.7	
Effective Green, g (s)	6.2	37.1		11.7	42.6	42.6	12.0	23.3	23.3	11.9	23.2	
Actuated g/C Ratio	0.06	0.37		0.12	0.43	0.43	0.12	0.23	0.23	0.12	0.23	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1268		207	1508	637	212	434	354	211	420	
v/s Ratio Prot	0.03	c0.21		c0.09	0.15		c0.12	0.16		0.11	c0.21	
v/s Ratio Perm						0.06			0.02			
v/c Ratio	0.45	0.56		0.74	0.36	0.13	0.98	0.69	0.08	0.91	0.90	
Uniform Delay, d1	46.3	25.0		42.7	19.4	17.4	43.9	35.0	30.0	43.5	37.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.96	
Incremental Delay, d2	2.2	1.8		12.2	0.7	0.4	56.1	4.1	0.1	38.4	20.7	
Delay (s)	47.4	26.7		54.9	20.1	17.9	100.0	39.2	30.1	78.7	56.5	
Level of Service	D	C		D	C	B	F	D	C	E	E	
Approach Delay (s)		28.1			25.6			57.4			63.9	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	40.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1020: 40th St & Harlan St — Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	760	44	96	812	12	33	12	98	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	826	48	104	883	13	36	13	107	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	896			874			1562	2002	437	1672	2020	448
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	896			874			1562	2002	437	1672	2020	448
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			86			36	74	81	100	82	98
cM capacity (veh/h)	753			768			56	49	567	36	48	658

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	551	323	104	588	307	42	113	18
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	753	1700	1700	768	1700	1700	55	353	93
Volume to Capacity	0.03	0.32	0.19	0.14	0.35	0.18	0.77	0.32	0.20
Queue Length 95th (ft)	2	0	0	12	0	0	82	34	17
Control Delay (s)	9.9	0.0	0.0	10.4	0.0	0.0	177.6	19.9	52.9
Lane LOS	A			B			F	C	F
Approach Delay (s)	0.3			1.1			62.9		52.9
Approach LOS							F		F

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	46.2%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1021: 40th St & Emery St — Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3450		1770	3481			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3450		1770	3481			1808	1555		1811	
Volume (vph)	30	768	101	124	733	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	835	110	135	797	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	937	0	135	854	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	6.7	37.5		11.4	40.2			21.5	21.5		15.1	
Effective Green, g (s)	6.2	37.5		10.9	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.06	0.38		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1294		193	1399			380	327		264	
v/s Ratio Prot	0.02	c0.27		c0.08	0.25			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.72		0.70	0.61			0.86	0.22		0.71	
Uniform Delay, d1	42.9	26.8		43.0	23.7			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.18	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	3.5		3.5	0.7			17.8	0.3		7.8	
Delay (s)	43.5	30.4		54.6	15.3			55.9	33.0		48.4	
Level of Service	D	C		D	B			E	C		D	
Approach Delay (s)		30.6			20.6			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1022: 40th St & San Pablo Avenue — Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3294		1770	3372		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3294		1770	3372		3433	3529		1770	3467	
Volume (vph)	205	531	297	46	397	146	420	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	577	323	50	432	159	457	1035	16	241	1052	111
RTOR Reduction (vph)	0	76	0	0	38	0	0	1	0	0	9	0
Lane Group Flow (vph)	223	824	0	50	553	0	457	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.3	26.6		5.6	16.9		14.0	37.5		15.3	38.8	
Effective Green, g (s)	14.3	27.6		4.6	17.9		13.0	37.5		14.3	38.8	
Actuated g/C Ratio	0.14	0.28		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	253	909		81	604		446	1323		253	1345	
v/s Ratio Prot	c0.13	c0.25		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.88	0.91		0.62	0.92		1.02	0.79		0.95	0.86	
Uniform Delay, d1	42.0	35.0		46.8	40.3		43.5	27.8		42.5	28.1	
Progression Factor	0.83	0.78		1.03	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.0	9.8		9.1	17.6		49.0	5.0		43.1	7.3	
Delay (s)	48.3	37.0		57.3	55.2		92.5	32.8		85.6	35.4	
Level of Service	D	D		E	E		F	C		F	D	
Approach Delay (s)		39.3			55.3			50.9			44.0	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	46.6	HCM Level of Service		D
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1023: 40th St & Adeline St — Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3440			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3440			3156			2746	
Volume (vph)	16	651	16	8	469	89	19	212	23	75	186	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	708	17	10	493	97	21	230	25	82	189	115
RTOR Reduction (vph)	0	3	0	0	23	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	722	0	10	573	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4					
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1968			549			478	
v/s Ratio Prot	c0.01	c0.20		0.01	0.17							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.36		0.48	0.29			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.23		1.00	1.00			1.00			1.00	
Incremental Delay, d2	20.3	0.2		6.1	0.4			0.6			1.9	
Delay (s)	45.0	7.2		30.6	5.9			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.1			8.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service		B
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰			↟			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	304	75	11	86	78	46	19	83	50	65	59	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	330	82	12	93	85	50	21	90	54	71	64	229
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	330	93	228	165	364							
Volume Left (vph)	330	0	93	21	71							
Volume Right (vph)	0	12	50	54	229							
Hadj (s)	0.53	0.06	0.02	0.14	0.31							
Departure Headway (s)	7.2	6.6	6.7	6.7	6.1							
Degree Utilization, x	0.66	0.17	0.42	0.31	0.61							
Capacity (veh/h)	470	518	485	464	559							
Control Delay (s)	22.3	9.8	14.4	12.7	18.1							
Approach Delay (s)	19.4		14.4	12.7	18.1							
Approach LOS	C		B	B	C							

Intersection Summary				
Delay	17.1			
HCM Level of Service	C			
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↦			↟	↱		↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1837			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	38	57	19	17	24	34	289	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			8			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↟			↰↟			↰↟			↰↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3510			3501	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3510			3501	
Volume (vph)	73	162	14	96	123	38	0	1123	66	0	1221	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1221	72	0	1327	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1290	0	0	1426	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2161	
v/s Ratio Prot					c0.08			0.37			c0.41	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.60			0.66	
Uniform Delay, d1		42.7			43.5			12.2			13.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.6	
Delay (s)		46.7			45.4			13.4			14.6	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.4			14.6	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↟	↱		↰↟			↰↟↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3184			5073	
Volume (vph)	0	0	0	64	237	549	10	828	0	0	1206	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	11	900	0	0	1313	22
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	487	0	921	0	0	1333	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1948			3100	
v/s Ratio Prot					0.09						0.26	
v/s Ratio Perm						c0.31		c0.29				
v/c Ratio					0.31	1.03		0.47			0.43	
Uniform Delay, d1					24.3	31.5		9.6			9.2	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	47.9		0.8			0.4	
Delay (s)					24.4	79.4		10.4			9.7	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			59.9			10.4			9.7	
Approach LOS		A			E			B			A	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.85	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3492		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3492		3433	3539	
Volume (vph)	20	470	78	0	0	0	0	795	78	692	716	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	864	85	843	778	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	943	0	843	778	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						48.1		24.1	76.2	
Effective Green, g (s)		23.8						49.1		25.1	76.2	
Actuated g/C Ratio		0.22						0.45		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						2.0		2.0	2.0	
Lane Grp Cap (vph)		748						1559		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.22	
v/s Ratio Perm												
v/c Ratio		0.82						0.61		0.82	0.31	
Uniform Delay, d1		41.1						23.1		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.8		6.6	0.0	
Delay (s)		48.0						24.8		46.9	5.9	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.8			24.5	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	161	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	197	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			206	201	13	399	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			206	201	13	399	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	82	100	99	100
cM capacity (veh/h)	1604			1605			710	857	1067	437	858	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	200	12
Volume Left	0	87	0	1
Volume Right	0	1	197	3
cSH	1604	1605	1056	699
Volume to Capacity	0.00	0.05	0.19	0.02
Queue Length 95th (ft)	0	4	17	1
Control Delay (s)	0.0	6.4	9.2	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	9.2	10.2
Approach LOS			A	B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↰	↳		↕			↰	↳
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	127	35	13	202	42	20	13	358	288	17	460	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	138	38	14	220	46	22	14	389	313	18	500	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	138	52	220	67	716	18	542	
Volume Left (vph)	138	0	220	0	14	18	0	
Volume Right (vph)	0	14	0	22	313	0	42	
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.22	0.53	-0.02	
Departure Headway (s)	9.3	8.6	8.9	8.2	7.3	8.0	7.5	
Degree Utilization, x	0.36	0.12	0.54	0.15	1.46	0.04	1.13	
Capacity (veh/h)	380	408	398	429	493	441	486	
Control Delay (s)	16.1	11.6	20.0	11.5	239.4	10.2	105.4	
Approach Delay (s)	14.9		18.7		239.4	102.3		
Approach LOS	B		C		F	F		

Intersection Summary			
Delay	135.1		
HCM Level of Service	F		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

Existing Plus Alt#3 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↰	↱
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	89	0	0	110	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	0	0	120	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			97		216	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			97		216	97
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1497		772	960

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	97	120	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1497	1700
Volume to Capacity	0.06	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	9.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	165	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	179	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	254	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	0.49	0.00	-0.13	0.04
Departure Headway (s)	4.2	4.6	4.0	4.4
Degree Utilization, x	0.02	0.08	0.29	0.08
Capacity (veh/h)	781	722	868	784
Control Delay (s)	7.3	8.0	8.6	7.8
Approach Delay (s)	7.3	8.0	8.6	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay		8.3		
HCM Level of Service		A		
Intersection Capacity Utilization	31.5%		ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	109	36	26	592	563	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	118	39	30	643	612	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1382	677	742			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1382	677	742			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	23	91	96			
cM capacity (veh/h)	163	459	865			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	30	643	742
Volume Left	118	30	0	0
Volume Right	39	0	0	130
cSH	183	865	1700	1700
Volume to Capacity	0.86	0.04	0.38	0.44
Queue Length 95th (ft)	158	3	0	0
Control Delay (s)	85.9	9.3	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	85.9	0.4		0.0
Approach LOS	F			

Intersection Summary				
Average Delay		6.8		
Intersection Capacity Utilization	51.8%		ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

Existing Plus Alt#3 SAT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3389		3539	1492		3520
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3389		3539	1492		3243
Volume (vph)	845	76	498	412	26	623
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	918	83	541	448	28	677
RTOR Reduction (vph)	6	0	0	226	0	0
Lane Group Flow (vph)	995	0	541	222	0	705
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	56.0		46.0	46.0		46.0
Actuated g/C Ratio	0.61		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1725		1480	624		1356
v/s Ratio Prot	c0.29		0.16			
v/s Ratio Perm				0.15		c0.22
v/c Ratio	0.58		0.37	0.36		0.52
Uniform Delay, d1	19.8		22.0	21.9		23.8
Progression Factor	0.31		0.56	1.96		1.00
Incremental Delay, d2	1.2		0.2	0.5		1.4
Delay (s)	7.1		12.5	43.2		25.2
Level of Service	A		B	D		C
Approach Delay (s)	7.1		26.4			25.2
Approach LOS	A		C			C

Intersection Summary				
HCM Average Control Delay		16.9	HCM Level of Service	B
HCM Volume to Capacity ratio		0.55		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.6%		ICU Level of Service	C
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	371	51	860	867	283	277
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	403	55	717	942	308	301
RTOR Reduction (vph)	0	25	0	0	0	23
Lane Group Flow (vph)	403	30	717	942	308	278
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	26.8	61.0	26.9	74.4	42.0	74.1
Effective Green, g (s)	28.1	60.5	28.4	73.9	41.5	73.6
Actuated g/C Ratio	0.26	0.55	0.26	0.67	0.38	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	452	871	886	1252	703	1059
v/s Ratio Prot	c0.23	0.02	c0.21	c0.51	0.17	0.18
v/s Ratio Perm						
v/c Ratio	0.89	0.03	0.81	0.75	0.44	0.26
Uniform Delay, d1	39.5	11.4	38.3	12.0	25.6	7.3
Progression Factor	0.36	0.03	0.42	1.96	1.00	1.00
Incremental Delay, d2	17.2	0.0	3.3	2.5	2.0	0.1
Delay (s)	32.2	0.3	19.2	18.8	27.5	7.4
Level of Service	C	A	B	B	C	A
Approach Delay (s)	28.3			19.0	17.6	
Approach LOS	C			B	B	

Intersection Summary				
HCM Average Control Delay		20.2	HCM Level of Service	C
HCM Volume to Capacity ratio		0.80		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.9%		ICU Level of Service	C
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1834	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1834	
Volume (vph)	26	21	7	815	13	16	41	250	1054	120	409	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	886	14	17	45	272	1146	130	445	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	465	451	0	45	282	1146	130	476	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		6	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.6	26.6		3.9	17.7	71.2	6.0	21.8	
Effective Green, g (s)	2.9	2.9	2.9	26.6	26.6		3.4	18.2	71.2	7.5	22.3	
Actuated g/C Ratio	0.04	0.04	0.04	0.37	0.37		0.05	0.26	1.00	0.11	0.31	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	64	628	628		85	905	1583	186	574	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.08		0.07	c0.26	
v/s Ratio Perm			0.00					c0.72				
v/c Ratio	0.39	0.30	0.01	0.74	0.72		0.53	0.31	0.72	0.70	0.83	
Uniform Delay, d1	33.3	33.2	32.8	19.3	19.1		33.1	21.4	0.0	30.8	22.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.4	3.7		2.7	0.1	2.9	8.9	9.5	
Delay (s)	34.6	34.0	32.8	23.8	22.7		35.8	21.6	2.9	39.7	32.2	
Level of Service	C	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.1			23.3			7.5			33.6	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	71.2	Sum of lost time (s)	0.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.98	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.93	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3014	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3014	1399				3433		1583
Volume (vph)	113	273	0	0	353	1254	0	0	0	1001	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1363	0	0	0	1088	0	263
RTOR Reduction (vph)	0	0	0	0	122	0	0	0	0	0	0	158
Lane Group Flow (vph)	123	297	0	0	627	998	0	0	0	1088	0	105
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	87.5			47.2	110.0				39.0		39.0
Effective Green, g (s)	11.3	82.5			47.2	110.0				39.5		39.5
Actuated g/C Ratio	0.10	0.57			0.43	1.00				0.36		0.36
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	2011			1293	1399				1233		568
v/s Ratio Prot	0.07	0.08			0.21							0.07
v/s Ratio Perm						c0.71				c0.32		
v/c Ratio	0.68	0.15			0.49	0.71				0.86		0.19
Uniform Delay, d1	47.6	11.2			22.6	0.0				33.1		24.2
Progression Factor	1.00	1.00			0.95	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			0.9	2.1				7.7		0.1
Delay (s)	55.2	11.4			22.3	2.1				40.8		24.3
Level of Service	E	B			C	A				D		C
Approach Delay (s)		24.2			10.7			0.0			37.6	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4636	1458	1681	1451	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1451	659			
Volume (vph)	111	1163	0	0	1235	439	372	21	1085	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1264	0	0	1342	477	404	23	1158	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	304	0	162	2	0	0	0
Lane Group Flow (vph)	121	1264	0	0	1342	173	404	440	577	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	48.0	48.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	633	389			
v/s Ratio Prot	0.07	c0.36			c0.29		0.24	0.30	c0.87			
v/s Ratio Perm						0.12						
v/c Ratio	0.74	1.06			0.80	0.33	0.55	0.69	1.48			
Uniform Delay, d1	49.8	36.5			31.5	25.4	23.0	25.1	22.5			
Progression Factor	1.21	0.59			0.65	1.24	1.00	1.00	1.00			
Incremental Delay, d2	11.7	40.0			2.9	1.1	3.0	6.2	230.4			
Delay (s)	70.4	61.4			23.7	32.7	26.0	31.3	252.9			
Level of Service	E	E			C	C	C	C	F			
Approach Delay (s)		62.2			30.5			110.9			0.0	
Approach LOS		E			C			F			A	

Intersection Summary			
HCM Average Control Delay	66.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1800	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1824	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.98	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1824	2628
Volume (vph)	637	450	1141	270	442	218	227	62	101	197	270	993
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	692	489	1240	293	480	236	247	67	110	214	293	1079
RTOR Reduction (vph)	0	209	95	0	0	97	0	0	98	0	0	78
Lane Group Flow (vph)	692	900	525	293	480	138	153	161	12	0	507	1001
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	46.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		497	1266
v/s Ratio Prot	c0.20	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.28	0.38
v/s Ratio Perm						0.09			0.01			
v/c Ratio	1.17	0.94	1.01	1.07	0.45	0.30	0.84	0.86	0.07		1.02	0.79
Uniform Delay, d1	46.5	36.4	31.5	46.5	31.2	29.8	48.0	48.2	44.0		40.0	23.9
Progression Factor	1.22	1.02	1.05	1.00	1.00	1.00	1.26	1.26	2.47		0.75	1.24
Incremental Delay, d2	77.0	2.3	13.7	74.0	1.4	1.7	23.7	26.6	0.1		42.2	4.3
Delay (s)	134.6	39.7	46.9	120.9	32.6	31.3	84.3	87.3	108.7		72.1	33.8
Level of Service	F	D	D	F	C	C	F	F	F		E	C
Approach Delay (s)		66.6			57.8			91.8			46.1	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM Average Control Delay	61.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3531			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3531			1863	
Volume (vph)	105	218	1025	51	0	120	0	1302	21	0	336	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1415	23	0	365	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1437	0	0	365	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	5		2					6	
Permitted Phases						3						
Actuated Green, G (s)	30.8	30.8	52.1	8.2		8.2		51.5			30.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			36.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.41			0.20	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.88			0.56	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		26.7			28.7	
Progression Factor	1.19	1.19	1.56	1.00		1.00		0.68			1.03	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		5.7			3.2	
Delay (s)	29.8	29.4	40.3	50.9		48.1		23.9			32.7	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.7				48.9		23.9			32.7	
Approach LOS		D				D		C			C	

Intersection Summary			
HCM Average Control Delay	32.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Volume (vph)	66	458	208	37	592	35	230	150	22	35	175	86
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	498	226	40	643	38	250	163	24	38	190	97
RTOR Reduction (vph)	0	61	0	0	5	0	0	8	0	0	0	83
Lane Group Flow (vph)	72	663	0	40	676	0	250	179	0	38	190	14
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Effective Green, g (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Actuated g/C Ratio	0.05	0.40		0.02	0.37		0.17	0.17		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	85	1337		58	1301		296	305		261	275	228
v/s Ratio Prot	c0.04	c0.20		0.02	0.19		c0.14	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.50		1.05	0.52		0.84	0.59		0.15	0.69	0.06
Uniform Delay, d1	28.5	13.6		28.5	14.8		24.3	23.2		22.4	24.4	22.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	50.4	0.3		162.1	0.4		19.3	2.9		0.3	7.3	0.1
Delay (s)	78.9	13.9		191.6	15.1		43.6	26.0		22.6	31.7	22.2
Level of Service	E	B		F	B		D	C		C	C	C
Approach Delay (s)		19.8			24.9			36.1			27.8	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3463		1770	3515			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3463		1770	3515			1801	1555		1772	
Volume (vph)	18	864	98	152	958	29	128	80	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	939	104	165	1041	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	1037	0	165	1072	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			8						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.6		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1558		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.30		c0.09	0.30			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.67		0.84	0.55			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.8		43.6	14.6			40.0	36.2		39.7	
Progression Factor	1.06	0.43		0.62	0.65			1.00	1.00		1.00	
Incremental Delay, d2	211.4	2.0		16.9	0.7			7.7	0.2		0.4	
Delay (s)	264.0	11.3		52.6	10.2			47.7	36.3		40.0	
Level of Service	F	B		D	B			D	D		D	
Approach Delay (s)		16.0			15.8			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95			1.00	0.95
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99			1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	3070		1770	3394		3433	3501			1770	3282
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.95	1.00
Satd. Flow (perm)	1770	3070		1770	3394		3433	3501			1770	3282
Volume (vph)	166	532	336	69	431	65	481	645	25	113	684	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	578	365	75	468	71	523	701	27	123	743	200
RTOR Reduction (vph)	0	98	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	845	0	75	527	0	523	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			19			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.3		5.2	24.4		16.5	35.7		10.8	30.0	
Effective Green, g (s)	12.6	32.3		4.7	24.4		16.0	36.7		10.3	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.37		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	992		83	828		549	1285		182	1017	
v/s Ratio Prot	c0.10	c0.28		0.04	0.16		c0.15	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.85		0.90	0.64		0.95	0.56		0.68	0.90	
Uniform Delay, d1	42.5	31.6		47.4	33.8		41.6	25.3		43.2	33.1	
Progression Factor	1.15	0.39		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.1	7.7		66.1	3.7		26.7	1.8		7.6	12.8	
Delay (s)	63.9	20.0		113.5	37.5		68.3	27.1		50.8	45.9	
Level of Service	E	C		F	D		E	C		D	D	
Approach Delay (s)		27.1			46.8			44.3			46.4	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
ALTERNATIVE #3
2010

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3392		1770	3518		1770	3424		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3392		1770	3518		1770	3424		1770	1863	1583
Volume (vph)	514	647	324	104	742	30	117	225	63	61	212	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	692	341	109	781	32	123	237	66	64	223	208
RTOR Reduction (vph)	0	32	0	0	2	0	0	24	0	0	0	176
Lane Group Flow (vph)	541	1201	0	109	811	0	123	279	0	64	223	32
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	52.4		10.7	28.5		13.2	13.2		16.7	16.7	16.7
Effective Green, g (s)	34.6	53.4		10.7	29.5		13.2	13.2		16.7	16.7	16.7
Actuated g/C Ratio	0.31	0.49		0.10	0.27		0.12	0.12		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1647		172	943		212	411		269	283	240
v/s Ratio Prot	c0.31	0.35		0.06	c0.23		0.07	c0.08		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.73		0.63	0.86		0.58	0.68		0.24	0.79	0.13
Uniform Delay, d1	37.2	22.5		47.8	36.3		46.8	46.4		41.1	44.9	40.4
Progression Factor	1.00	1.00		0.90	1.26		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	2.9		5.2	7.2		3.3	4.0		0.5	13.5	0.2
Delay (s)	68.0	25.4		48.2	56.3		49.1	50.4		41.5	58.4	40.6
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.4			55.3			50.0			46.8	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	45.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3437		1770	3482		1770	3449	
Flt Permitted	0.21	1.00			0.67		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	388	3453			2303		1770	3482		1770	3449	
Volume (vph)	122	709	137	58	551	123	194	660	80	116	750	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	61	580	129	204	695	84	124	789	162
RTOR Reduction (vph)	0	17	0	0	17	0	0	7	0	0	14	0
Lane Group Flow (vph)	128	873	0	0	753	0	204	772	0	124	937	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	39.3	39.3			39.3		15.2	41.7		16.0	42.5	
Effective Green, g (s)	39.3	39.3			39.3		15.2	42.7		16.0	43.5	
Actuated g/C Ratio	0.36	0.36			0.36		0.14	0.39		0.15	0.40	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	139	1234			823		245	1352		257	1364	
v/s Ratio Prot		0.25					c0.12	0.22		0.07	c0.27	
v/s Ratio Perm	c0.33				0.33							
v/c Ratio	0.92	0.71			0.91		0.83	0.57		0.48	0.69	
Uniform Delay, d1	33.9	30.4			33.7		46.2	26.4		43.2	27.6	
Progression Factor	0.46	0.51			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	42.5	1.3			14.5		20.8	1.8		1.4	2.8	
Delay (s)	58.1	16.7			48.3		67.0	28.2		44.6	30.4	
Level of Service	E	B			D		E	C		D	C	
Approach Delay (s)		21.9			48.3			36.3			32.1	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	33.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	102	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	107	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	332	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	332	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	90	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	538	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	109	1
Volume Left	0	81	2	0
Volume Right	0	1	107	0
cSH	1545	1616	1068	640
Volume to Capacity	0.00	0.05	0.10	0.00
Queue Length 95th (ft)	0	4	9	0
Control Delay (s)	0.0	4.4	8.8	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.8	10.6
Approach LOS			A	B

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	26.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.89			0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1777		1770	1783	
Flt Permitted	0.65	1.00		0.71	1.00			0.98		0.28	1.00	
Satd. Flow (perm)	1214	1842		1326	1665			1742		527	1783	
Volume (vph)	66	61	5	96	47	112	11	167	66	119	227	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	64	5	100	49	118	12	176	91	125	239	95
RTOR Reduction (vph)	0	3	0	0	62	0	0	34	0	0	32	0
Lane Group Flow (vph)	69	66	0	100	105	0	0	245	0	125	302	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	28.9	28.9		28.9	28.9			13.1		24.1	24.1	
Effective Green, g (s)	28.4	28.4		28.4	28.4			12.6		23.6	23.6	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.21		0.39	0.39	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	575	872		628	788			366		352	701	
v/s Ratio Prot		0.04			0.06					0.04	c0.17	
v/s Ratio Perm	0.06			c0.08				c0.14		0.10		
v/c Ratio	0.12	0.08		0.16	0.13			0.67		0.36	0.43	
Uniform Delay, d1	8.8	8.6		9.0	8.9			21.8		13.2	13.3	
Progression Factor	1.00	1.00		0.77	0.55			1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.5	0.3			4.6		0.6	0.4	
Delay (s)	9.2	8.8		7.5	5.3			26.4		13.9	13.7	
Level of Service	A	A		A	A			C		B	B	
Approach Delay (s)		9.0			6.1			26.4			13.8	
Approach LOS		A			A			C			B	

Intersection Summary				
HCM Average Control Delay	14.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	1856		1770	1863	1751	
Flt Permitted	1.00		0.59	1.00	0.98	
Satd. Flow (perm)	1856		1094	1863	1751	
Volume (vph)	259	6	25	195	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	6	26	205	62	11
RTOR Reduction (vph)	1	0	0	0	10	0
Lane Group Flow (vph)	280	0	26	205	63	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	46.0		46.0	46.0	5.0	
Effective Green, g (s)	47.5		47.5	47.5	4.5	
Actuated g/C Ratio	0.79		0.79	0.79	0.08	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1469		866	1475	131	
v/s Ratio Prot	c0.15			0.11	c0.04	
v/s Ratio Perm			0.02			
v/c Ratio	0.19		0.03	0.14	0.48	
Uniform Delay, d1	1.5		1.3	1.5	26.6	
Progression Factor	0.66		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.1	0.2	2.8	
Delay (s)	1.6		1.4	1.7	29.4	
Level of Service	A		A	A	C	
Approach Delay (s)	1.6			1.6	29.4	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	5.1	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1729			1827		1770	1850		1770	1819	
Flt Permitted		0.80			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1581			1444		1770	1850		1770	1819	
Volume (vph)	76	90	132	37	80	4	36	281	14	23	443	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	95	139	39	84	4	38	309	15	24	466	87
RTOR Reduction (vph)	0	56	0	0	2	0	0	3	0	0	11	0
Lane Group Flow (vph)	0	255	0	0	125	0	38	320	0	24	542	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			4		5	2		1	6	
Permitted Phases	6			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		316			289		85	1003		32	931	
v/s Ratio Prot							c0.02	0.17		0.01	c0.30	
v/s Ratio Perm		c0.16			0.09							
v/c Ratio		0.81			0.43		0.45	0.32		0.75	0.58	
Uniform Delay, d1		19.1			17.5		23.2	6.3		24.4	8.5	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		13.7			0.8		2.7	0.8		62.8	2.7	
Delay (s)		32.8			18.3		23.0	8.2		87.2	11.1	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		32.8			18.3			9.7			14.3	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	17.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	51	12	4	22	101	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	106	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	196	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.15	0.00
Departure Headway (s)	4.3	4.7	4.0	4.3
Degree Utilization, x	0.01	0.09	0.22	0.10
Capacity (veh/h)	764	717	865	814
Control Delay (s)	7.4	8.1	8.2	7.8
Approach Delay (s)	7.4	8.1	8.2	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.1			
HCM Level of Service	A			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	79	24	23	207	284	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	25	24	218	299	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	583	322	345			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583	322	345			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	96	98			
cM capacity (veh/h)	465	719	1214			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	108	24	213	345
Volume Left	83	24	0	0
Volume Right	25	0	0	46
cSH	507	1214	1700	1700
Volume to Capacity	0.21	0.02	0.13	0.20
Queue Length 95th (ft)	20	2	0	0
Control Delay (s)	14.0	8.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.0	0.8		0.0
Approach LOS	B			

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		31.6%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1660		1770	3539	1583		3522	
Flt Permitted		0.97	1.00	0.95	0.96		0.47	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1660		881	3539	1583		3307	
Volume (vph)	39	28	117	358	4	29	59	314	149	17	422	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	377	4	31	62	331	157	18	444	9
RTOR Reduction (vph)	0	0	116	0	7	0	0	0	52	0	1	0
Lane Group Flow (vph)	0	70	7	213	192	0	62	331	105	0	470	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.2	15.2		67.4	67.4	67.4		67.4	
Effective Green, g (s)		6.9	6.9	15.2	15.2		66.9	66.9	66.9		66.9	
Actuated g/C Ratio		0.06	0.06	0.15	0.15		0.67	0.67	0.67		0.67	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	256	252		589	2388	1059		2212	
v/s Ratio Prot		c0.04		c0.13	0.12			0.09				
v/s Ratio Perm			0.00				0.07		0.07		c0.14	
v/c Ratio		0.65	0.08	0.83	0.76		0.11	0.14	0.10		0.21	
Uniform Delay, d1		46.1	44.5	41.2	40.7		5.9	6.0	5.9		6.4	
Progression Factor		1.00	1.00	1.61	1.53		0.04	0.05	0.60		1.00	
Incremental Delay, d2		12.1	0.3	19.6	12.5		0.3	0.1	0.2		0.2	
Delay (s)		58.2	44.7	81.7	74.7		0.5	0.4	0.2		6.6	
Level of Service		E	D	F	E		A	A	A		A	
Approach Delay (s)		49.6		78.4				0.3			6.6	
Approach LOS		D		E				A			A	

Intersection Summary				
HCM Average Control Delay		27.9	HCM Level of Service	C
HCM Volume to Capacity ratio		0.35		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		48.7%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	106	43	253	242	101	180
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	45	266	255	106	189
RTOR Reduction (vph)	0	32	0	0	0	175
Lane Group Flow (vph)	112	13	266	255	106	14
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	11.3	29.3	14.5	81.7	63.7	11.3
Effective Green, g (s)	10.8	28.8	14.0	81.2	63.2	10.8
Actuated g/C Ratio	0.11	0.29	0.14	0.81	0.63	0.11
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	456	481	1513	1177	171
v/s Ratio Prot	c0.06	0.01	c0.08	c0.14	0.06	0.01
v/s Ratio Perm						
v/c Ratio	0.59	0.03	0.55	0.17	0.09	0.12
Uniform Delay, d1	42.5	25.6	40.1	2.0	7.2	40.3
Progression Factor	0.89	3.10	0.96	0.09	1.00	1.00
Incremental Delay, d2	4.5	0.0	1.4	0.2	0.2	0.3
Delay (s)	42.4	79.4	39.9	0.4	7.3	40.6
Level of Service	D	E	D	A	A	D
Approach Delay (s)	53.0			20.6	29.0	
Approach LOS	D			C	C	

Intersection Summary				
HCM Average Control Delay		28.4	HCM Level of Service	C
HCM Volume to Capacity ratio		0.27		
Actuated Cycle Length (s)		100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		26.4%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		1.00	
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	
Flt Protected		0.95	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1770	1863	1681	1701		1770	3539	1583		3539	
Flt Permitted		0.95	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (perm)		1770	1863	1681	1701		1770	3539	1583		3539	
Volume (vph)	5	21	16	701	79	0	88	91	804	76	241	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	738	83	0	93	96	852	80	254	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	400	421	0	93	96	852	80	318	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.8	2.8	2.8	23.7	23.7		4.7	16.0	62.4	4.4	15.7	
Effective Green, g (s)	2.3	2.3	2.3	23.7	23.7		4.2	16.5	62.4	3.9	16.2	
Actuated g/C Ratio	0.04	0.04	0.04	0.38	0.38		0.07	0.26	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	65	69	58	638	648		119	936	1583	111	467	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	0.18	
v/s Ratio Perm			0.00						c0.60			
v/c Ratio	0.08	0.32	0.01	0.63	0.65		0.78	0.10	0.60	0.72	0.68	
Uniform Delay, d1	29.0	29.3	29.0	15.8	15.9		28.6	17.4	0.0	28.7	20.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.7	2.1		25.7	0.0	1.7	17.6	3.7	
Delay (s)	29.2	30.3	29.0	17.4	18.1		54.4	17.4	1.7	46.3	24.5	
Level of Service	C	C	C	B	B		D	B	A	D	C	
Approach Delay (s)		29.6			17.7			7.3			28.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay		14.9	HCM Level of Service	B
HCM Volume to Capacity ratio		0.60		
Actuated Cycle Length (s)		62.4	Sum of lost time (s)	0.0
Intersection Capacity Utilization		60.0%	ICU Level of Service	B
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97	1.00	
Frt	1.00	0.93			0.99	0.85				1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (prot)	1770	3291			3371	1441				3433	1583	
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	
Satd. Flow (perm)	1770	3291			3371	1441				3433	1583	
Volume (vph)	119	216	190	0	691	1074	0	0	0	816	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1131	0	0	0	859	0	136
RTOR Reduction (vph)	0	75	0	0	2	0	0	0	0	0	0	96
Lane Group Flow (vph)	125	352	0	0	753	1103	0	0	0	859	0	40
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.7			39.7	100.0				28.8		28.8
Effective Green, g (s)	19.0	62.7			39.7	100.0				29.3		29.3
Actuated g/C Ratio	0.19	0.63			0.40	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2083			1338	1441				1006		464
v/s Ratio Prot	0.07	0.11			0.22					0.25		
v/s Ratio Perm						c0.77						0.03
v/c Ratio	0.37	0.17			0.56	0.77				0.85		0.09
Uniform Delay, d1	35.3	7.8			23.4	0.0				33.3		25.6
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	2.0				7.1		0.1
Delay (s)	35.6	8.0			16.6	2.0				40.4		25.7
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.2			7.9			0.0		38.4		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	17.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	70.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.88	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1465	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1465	1504			
Volume (vph)	74	957	0	0	1154	357	511	2	1154	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1007	0	0	1215	376	643	2	1215	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	256	0	80	34	0	0	0
Lane Group Flow (vph)	78	1007	0	0	1215	120	580	578	610	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	557	677			
v/s Ratio Prot	0.04	c0.20			c0.26		0.33	c0.39	c0.41			
v/s Ratio Perm						0.08						
v/c Ratio	0.24	0.42			0.82	0.24	0.88	1.03	0.90			
Uniform Delay, d1	35.2	17.5			31.3	25.0	28.8	31.0	25.4			
Progression Factor	0.68	0.48			0.53	0.30	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.5			3.9	0.8	13.1	47.2	15.4			
Delay (s)	25.4	8.9			20.5	8.3	41.9	78.2	40.9			
Level of Service	C	A			C	A	D	E	D			
Approach Delay (s)		10.1			17.6			54.4			0.0	
Approach LOS		B			B			D			A	

Intersection Summary				
HCM Average Control Delay	30.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1791	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1791	2628
Volume (vph)	435	1306	370	75	743	98	42	3	42	184	45	732
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	458	1375	389	79	782	103	44	3	44	194	47	771
RTOR Reduction (vph)	0	0	188	0	0	20	0	0	41	0	0	193
Lane Group Flow (vph)	458	1375	201	79	782	83	23	24	3	0	241	578
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 6
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.0	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		537	1317
v/s Ratio Prot	0.13	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.13	0.22
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.66	0.99	0.27	0.71	0.82	0.20	0.20	0.21	0.03		0.45	0.44
Uniform Delay, d1	36.8	29.5	13.6	45.9	34.2	26.1	43.9	44.0	43.4		28.3	16.0
Progression Factor	1.16	0.68	0.43	1.00	1.00	1.00	1.00	1.00	1.00		1.22	0.96
Incremental Delay, d2	3.4	18.6	0.1	15.2	7.7	1.0	0.6	0.6	0.1		2.5	1.0
Delay (s)	45.7	38.8	6.0	61.1	41.9	27.1	44.6	44.6	43.5		37.0	16.2
Level of Service	D	D	A	E	D	C	D	D	D		D	B
Approach Delay (s)		32.0			42.1			44.1			21.2	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	32.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.86					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	257	0	0	0	0	500	9	0	149	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	526	9	0	157	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	534	0	0	157	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.8					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.15			0.08	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.23			0.15	
Uniform Delay, d1	26.8	26.8	21.2					7.4			10.6	
Progression Factor	0.96	0.96	0.77					1.00			0.95	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.3	
Delay (s)	25.9	25.7	16.3					7.7			10.4	
Level of Service	C	C	B					A			B	
Approach Delay (s)		18.6			0.0			7.7			10.4	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.20			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	24.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3337		1770	3480		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3337		1770	3480		1770	1832		1770	1863	1583
Volume (vph)	393	449	272	36	481	61	264	210	25	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	473	292	38	506	64	267	221	27	29	212	108
RTOR Reduction (vph)	0	76	0	0	10	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	689	0	38	560	0	267	243	0	29	212	17
Turn Type	Prot				Prot			Split			Split	Perm
Protected Phases	5	2			1	6		8			7	
Permitted Phases												7
Actuated Green, G (s)	27.5	44.3		6.7	22.5		19.0	19.0		16.0	16.0	16.0
Effective Green, g (s)	27.0	44.8		5.2	23.0		18.5	18.5		15.5	15.5	15.5
Actuated g/C Ratio	0.27	0.45		0.05	0.23		0.18	0.18		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	478	1495		92	800		327	339		274	289	245
v/s Ratio Prot	c0.23	0.21		0.02	c0.16		c0.15	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.87	0.46		0.41	0.70		0.82	0.72		0.11	0.73	0.07
Uniform Delay, d1	34.8	19.2		45.9	35.3		39.1	38.3		36.3	40.3	35.1
Progression Factor	1.00	1.00		1.00	1.00		0.97	0.97		0.81	0.85	1.27
Incremental Delay, d2	15.1	1.0		3.0	5.1		14.5	7.1		0.2	9.0	0.1
Delay (s)	49.9	20.2		48.9	40.4		52.5	44.2		29.5	43.3	45.8
Level of Service	D	C		D	D		D	D		C	D	D
Approach Delay (s)		30.6			40.9			48.5			42.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	38.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3374		1770	3513		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3374		1770	3513		1770	3487		1770	3497	
Volume (vph)	94	267	121	100	423	22	122	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	281	127	105	445	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	56	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	352	0	105	464	0	134	628	0	52	867	0
Turn Type	Prot				Prot			Prot			Prot	
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases												
Actuated Green, G (s)	7.9	17.9		9.3	19.3		12.6	50.6		7.2	45.2	
Effective Green, g (s)	6.9	18.4		8.3	19.8		11.6	51.1		6.2	45.7	
Actuated g/C Ratio	0.07	0.18		0.08	0.20		0.12	0.51		0.06	0.46	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	621		147	696		205	1782		110	1598	
v/s Ratio Prot	0.06	0.10		c0.06	c0.13		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.57		0.71	0.67		0.65	0.35		0.47	0.54	
Uniform Delay, d1	45.9	37.2		44.7	37.1		42.3	14.6		45.3	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.2		15.2	2.4		7.3	0.5		3.2	1.3	
Delay (s)	78.0	38.4		59.9	39.5		49.6	15.1		48.5	20.9	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		46.1			43.2			21.1			22.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	30.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3410		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3410		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	278	89	43	352	177	82	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	293	94	45	371	186	86	165	32	26	53	9
RTOR Reduction (vph)	0	19	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	368	0	45	371	101	86	188	0	0	83	0
Turn Type	Prot				Prot	Perm	Split			Split		
Protected Phases	1	6			5	2	7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0			5.3	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0			4.8	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52			0.05	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0			3.5	4.0	4.0	3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0			2.5	3.0	3.0	2.5	2.5		2.5	
Lane Grp Cap (vph)	46	1773			85	1918	858	251	258		235	
v/s Ratio Prot	0.01	c0.11			c0.03	0.10		0.05	c0.10		c0.05	
v/s Ratio Perm							0.06					
v/c Ratio	0.54	0.21			0.53	0.19	0.12	0.34	0.73		0.35	
Uniform Delay, d1	48.1	12.9			46.5	11.7	11.2	38.7	41.1		39.7	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	10.0	0.3			4.5	0.2	0.3	0.6	9.6		0.7	
Delay (s)	58.1	13.2			51.0	11.9	11.5	39.3	50.7		40.3	
Level of Service	E	B			D	B	B	D	D		D	
Approach Delay (s)		15.8				14.7			47.2		40.3	
Approach LOS		B				B			D		D	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.99
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3432		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3432		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	66	52	527	187	137	255	30	131	185	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	69	55	555	197	144	268	41	138	195	11
RTOR Reduction (vph)	0	18	0	0	0	100	0	0	32	0	2	0
Lane Group Flow (vph)	29	323	0	55	555	97	144	268	9	138	204	0
Turn Type	Prot				Prot	Perm	Prot		Perm	Prot		
Protected Phases	1	6			5	2	3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.5			7.0	49.0	49.0	12.3	23.5	23.5	8.5	19.7
Effective Green, g (s)	4.0	46.5			6.5	49.0	49.0	11.8	23.0	23.0	8.0	19.2
Actuated g/C Ratio	0.04	0.46			0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.19
Clearance Time (s)	3.5	4.0			3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5
Vehicle Extension (s)	2.5	3.0			2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	71	1596			115	1734	776	209	428	364	142	355
v/s Ratio Prot	0.02	0.09			c0.03	c0.16		0.08	c0.14		c0.08	0.11
v/s Ratio Perm							0.06			0.01		
v/c Ratio	0.41	0.20			0.48	0.32	0.12	0.69	0.63	0.03	0.97	0.57
Uniform Delay, d1	46.8	15.8			45.1	15.4	13.8	42.3	34.6	29.8	45.9	36.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.83
Incremental Delay, d2	2.8	0.3			2.3	0.5	0.3	8.4	2.5	0.0	65.5	1.8
Delay (s)	49.6	16.1			47.4	15.9	14.2	50.7	37.1	29.8	113.1	32.2
Level of Service	D	B			D	B	B	D	D	C	F	C
Approach Delay (s)		18.7				17.6			40.8		64.7	
Approach LOS		B				B			D		E	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	366	16	90	745	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	400	17	95	784	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	806			423			1049	1401	212	1323	1458	403
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	806			423			1049	1461	212	1323	1458	403
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			63	88	90	98	97	100
cM capacity (veh/h)	814			1133			162	113	794	86	114	597

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	271	152	95	523	284	34	85	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	814	1700	1700	1133	1700	1700	149	535	117
Volume to Capacity	0.03	0.16	0.09	0.08	0.31	0.17	0.23	0.16	0.05
Queue Length 95th (ft)	2	0	0	7	0	0	21	14	4
Control Delay (s)	9.6	0.0	0.0	8.5	0.0	0.0	36.1	13.0	37.6
Lane LOS	A			A			E	B	E
Approach Delay (s)	0.5			0.9			19.6		37.6
Approach LOS							C		E

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3472		1770	3498			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.84	
Satd. Flow (perm)	1770	3472		1770	3498			1805	1583		1545	
Volume (vph)	3	396	57	122	626	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	417	60	128	659	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	469	0	128	711	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split			Perm	Perm	
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases										7		8
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.49		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1701		191	2078			310	272		108	
v/s Ratio Prot	0.00	c0.14		c0.07	c0.20			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.28		0.67	0.34			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.0		42.9	10.3			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.3	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.4		54.2	7.4			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.8			14.5			46.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.86		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3381		1770	3386		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3381		1770	3386		3433	3534		1770	3508	
Volume (vph)	92	288	145	32	442	179	293	785	6	160	671	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	303	153	34	465	188	316	826	6	168	917	57
RTOR Reduction (vph)	0	70	0	0	44	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	386	0	34	609	0	315	831	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	21.9		8.3	21.7		15.0	43.5		13.3	41.8	
Effective Green, g (s)	7.5	20.9		7.3	20.7		14.0	43.5		12.3	41.8	
Actuated g/C Ratio	0.08	0.21		0.07	0.21		0.14	0.44		0.12	0.42	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	702		129	701		481	1537		218	1466	
v/s Ratio Prot	c0.05	0.11		0.02	c0.18		c0.09	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.55		0.26	0.87		0.65	0.54		0.77	0.66	
Uniform Delay, d1	46.3	35.3		43.8	38.3		40.7	20.9		42.5	23.4	
Progression Factor	1.31	1.03		1.14	1.09		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.7		0.4	10.4		2.4	1.4		14.2	2.4	
Delay (s)	74.7	37.2		50.2	52.2		43.2	22.3		56.8	25.8	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.8			52.1			28.0			30.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.98			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3501		1770	3496			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3501		1770	3496			3172			2914	
Volume (vph)	50	385	29	78	581	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	405	31	82	611	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	426	0	82	633	0	0	196	0	0	360	0
Turn Type	Prot			Prot						Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases										4		8
Actuated Green, G (s)	2.6	25.9		3.9	27.0			9.2			9.2	
Effective Green, g (s)	2.3	25.9		3.4	27.0			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	81	1814		120	1888			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.18							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.65	0.23		0.68	0.34			0.35			0.71	
Uniform Delay, d1	23.5	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.73	1.30		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.2	0.3		12.1	0.5			0.4			4.7	
Delay (s)	29.4	8.9		34.8	6.9			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		11.1			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	236	57	2	8	76	26	2	1	2	16	4	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	251	60	2	8	82	27	2	1	2	17	4	160
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	251	62	116	5	181							
Volume Left (vph)	251	0	8	2	17							
Volume Right (vph)	0	2	27	2	160							
Hadj (s)	0.53	0.01	0.09	0.13	0.48							
Departure Headway (s)	5.6	5.1	4.8	5.1	4.5							
Degree Utilization, x	0.39	0.09	0.16	0.01	0.23							
Capacity (veh/h)	620	684	715	632	739							
Control Delay (s)	10.9	7.4	8.6	8.2	8.8							
Approach Delay (s)	10.2		8.6	8.2	8.8							
Approach LOS	B		A	A	A							

Intersection Summary			
Delay	9.5		
HCM Level of Service	A		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↔	↱		↔			↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.89		1.00	0.85		0.97			0.96	
Flt Protected		0.95	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1770	1664		1789	1583		1811			1785	
Flt Permitted		0.95	1.00		0.96	1.00		0.99			0.98	
Satd. Flow (perm)		1770	1664		1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	328	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3504			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3504			3490	
Volume (vph)	60	193	12	111	250	20	0	1008	72	0	955	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	263	21	0	1059	76	0	1005	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1131	0	0	1100	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.32			0.32	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.54			0.53	
Uniform Delay, d1		43.9			42.1			12.8			12.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.0			1.0	
Delay (s)		52.4			46.5			13.8			13.8	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.8			13.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔	↱		↔			↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.99	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3260			5076	
Volume (vph)	0	0	0	65	461	718	12	511	0	0	1000	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	538	0	0	1053	13
RTOR Reduction (vph)	0	0	0	0	0	196	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	560	0	551	0	0	1065	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					36.1	36.1		54.9			54.9	
Effective Green, g (s)					36.1	36.1		55.9			55.9	
Actuated g/C Ratio					0.36	0.36		0.56			0.56	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1270	571		1822			2837	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.35		0.17				
v/c Ratio					0.44	0.98		0.30			0.38	
Uniform Delay, d1					24.2	31.6		11.7			12.3	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	32.5		0.4			0.4	
Delay (s)					24.3	64.1		12.1			12.7	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			47.3			12.1			12.7	
Approach LOS		A			D			B			B	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.96						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3488		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3488		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	505	54	434	598	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	532	57	457	629	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	581	0	457	629	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	48.7	
Effective Green, g (s)		13.3						32.2		12.5	48.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		661						1604		613	2462	
v/s Ratio Prot		c0.13						c0.17		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.36		0.75	0.26	
Uniform Delay, d1		26.3						12.2		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.6		4.3	0.0	
Delay (s)		28.4						12.9		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			12.9			15.6	
Approach LOS		C			A			B			B	

Intersection Summary				
HCM Average Control Delay	17.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↕		↰	↕		↰	↕		↰	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3425		1770	3503		1770	3421		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3425		1770	3503		1770	3421		1770	1863	1583
Volume (vph)	290	760	208	138	862	64	186	450	129	189	315	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	219	146	907	67	196	474	136	199	332	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	24	0	0	0	305
Lane Group Flow (vph)	305	997	0	146	969	0	196	586	0	146	332	204
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.1		12.6	30.6		20.0	20.0		21.3	21.3	21.3
Effective Green, g (s)	21.1	40.1		12.6	31.6		20.0	20.0		21.3	21.3	21.3
Actuated g/C Ratio	0.19	0.36		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1249		203	1006		322	622		343	361	307
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.11	c0.17		0.08	c0.18	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.80		0.72	0.96		0.61	0.94		0.43	0.92	0.67
Uniform Delay, d1	43.4	31.3		47.0	38.6		41.4	44.4		39.0	43.5	41.0
Progression Factor	1.00	1.00		1.16	0.94		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.4		2.9	7.6		2.1	19.0		0.9	27.7	5.4
Delay (s)	68.2	36.7		58.5	44.0		43.6	64.0		39.8	71.2	46.4
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		43.9			45.9			59.0			53.6	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	49.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↕			↕		↰	↕		↰	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3436		1770	3491		1770	3450	
Flt Permitted	0.16	1.00			0.67		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	341	3385			2310		1770	3491		1770	3450	
Volume (vph)	198	835	260	74	665	146	270	1085	109	186	997	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	868	274	78	700	158	284	1142	115	196	1049	213
RTOR Reduction (vph)	0	41	0	0	15	0	0	7	0	0	15	0
Lane Group Flow (vph)	208	901	0	0	919	0	284	1250	0	196	1247	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	149	1477			1008		274	1111		241	1035	
v/s Ratio Prot		0.27					0.16	c0.36		0.11	c0.36	
v/s Ratio Perm	c0.61				0.40							
v/c Ratio	1.40	0.61			0.91		1.04	1.13		0.81	1.20	
Uniform Delay, d1	31.0	23.8			29.0		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	203.4	0.5			12.1		84.2	68.4		18.5	101.3	
Delay (s)	237.4	26.7			41.1		110.7	105.9		64.7	139.8	
Level of Service	F	C			D		F	F		E	F	
Approach Delay (s)		64.8			41.1			106.8			129.7	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	91.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	113.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	178	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	187	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			342	341	20	529	341	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	529	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	82	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	361	526	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	168	191	2
Volume Left	1	151	2	1
Volume Right	0	0	187	0
cSH	1599	1596	1042	421
Volume to Capacity	0.00	0.09	0.18	0.01
Queue Length 95th (ft)	0	8	17	0
Control Delay (s)	0.4	6.8	9.2	13.6
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.2	13.6
Approach LOS			A	B

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	33.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.90			0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1672			1768		1770	1818	
Flt Permitted	0.37	1.00		0.70	1.00			0.99		0.26	1.00	
Satd. Flow (perm)	693	1844		1303	1672			1758		492	1818	
Volume (vph)	138	79	6	208	106	227	10	444	268	89	346	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	145	83	6	219	112	239	11	467	282	94	364	69
RTOR Reduction (vph)	0	4	0	0	122	0	0	37	0	0	12	0
Lane Group Flow (vph)	145	85	0	219	229	0	0	723	0	94	421	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	19.1	19.1		19.1	19.1			26.7		33.9	33.9	
Effective Green, g (s)	18.6	18.6		18.6	18.6			26.2		33.4	33.4	
Actuated g/C Ratio	0.31	0.31		0.31	0.31			0.44		0.56	0.56	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	215	572		404	518			768		342	1012	
v/s Ratio Prot		0.05			0.14					0.01	c0.23	
v/s Ratio Perm	c0.21			0.17				c0.41		0.14		
v/c Ratio	0.67	0.15		0.54	0.44			0.94		0.27	0.42	
Uniform Delay, d1	18.1	15.0		17.2	16.5			16.2		15.7	7.7	
Progression Factor	1.00	1.00		1.20	1.43			1.00		1.00	1.00	
Incremental Delay, d2	15.7	0.5		5.0	2.6			19.6		0.4	0.3	
Delay (s)	33.7	15.5		25.6	26.3			35.8		16.1	7.9	
Level of Service	C	B		C	C			D		B	A	
Approach Delay (s)		26.8			26.0			35.8			9.4	
Approach LOS		C			C			D			A	

Intersection Summary				
HCM Average Control Delay	25.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	96.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.96	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1853		1770	1863	1751	
Flt Permitted	1.00		0.48	1.00	0.96	
Satd. Flow (perm)	1853		895	1863	1751	
Volume (vph)	419	16	33	427	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	441	17	35	449	120	21
RTOR Reduction (vph)	1	0	0	0	16	0
Lane Group Flow (vph)	457	0	35	449	125	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	44.0		44.0	44.0	9.0	
Effective Green, g (s)	43.5		43.5	43.5	8.5	
Actuated g/C Ratio	0.72		0.72	0.72	0.14	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1343		649	1351	248	
v/s Ratio Prot	c0.25			0.24	c0.07	
v/s Ratio Perm			0.04			
v/c Ratio	0.34		0.05	0.33	0.50	
Uniform Delay, d1	3.0		2.4	3.0	23.8	
Progression Factor	0.29		1.00	1.00	1.00	
Incremental Delay, d2	0.5		0.2	0.7	1.6	
Delay (s)	1.4		2.5	3.7	25.4	
Level of Service	A		A	A	C	
Approach Delay (s)	1.4			3.6	25.4	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	5.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	41.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1776			1811		1770	1842		1770	1738	
Flt Permitted		0.78			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1413			1593		1770	1842		1770	1738	
Volume (vph)	181	228	66	36	136	20	183	657	44	19	354	204
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	240	72	38	143	21	172	692	46	20	373	215
RTOR Reduction (vph)	0	11	0	0	8	0	0	4	0	0	37	0
Lane Group Flow (vph)	0	492	0	0	194	0	172	734	0	20	551	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		411			463		222	874		29	635	
v/s Ratio Prot							c0.10	c0.40		0.01	0.32	
v/s Ratio Perm		c0.35			0.12							
v/c Ratio		1.20			0.42		0.77	0.84		0.69	0.87	
Uniform Delay, d1		19.5			15.7		23.3	12.6		26.9	16.2	
Progression Factor		1.00			1.00		0.91	1.06		0.86	1.06	
Incremental Delay, d2		110.5			0.4		13.1	8.4		41.2	12.7	
Delay (s)		130.0			16.2		34.3	21.8		67.5	29.9	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		130.0			16.2			24.1			31.2	
Approach LOS		F			B			C			C	

Intersection Summary				
HCM Average Control Delay	49.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	92.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	182	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	192	71	5	146	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	119	280	153
Volume Left (vph)	4	107	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.10	-0.10	0.04
Departure Headway (s)	4.7	5.2	4.5	4.8
Degree Utilization, x	0.11	0.17	0.35	0.20
Capacity (veh/h)	685	632	764	705
Control Delay (s)	8.2	9.3	9.9	9.0
Approach Delay (s)	8.2	9.3	9.9	9.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay	9.4			
HCM Level of Service	A			
Intersection Capacity Utilization	40.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	97	42	28	615	428	135
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	44	29	647	451	142
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					654	
pX, platoon unblocked	0.99	0.99	0.99			
vC, conflicting volume	1228	522	593			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1231	515	587			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	45	92	97			
cM capacity (veh/h)	167	552	974			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	146	29	647	593
Volume Left	102	29	0	0
Volume Right	44	0	0	142
cSH	234	974	1700	1700
Volume to Capacity	0.63	0.03	0.38	0.35
Queue Length 95th (ft)	93	2	0	0
Control Delay (s)	43.1	8.8	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	43.1	0.4		0.0
Approach LOS	E			

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1650		1770	3539	1452		3480	
Flt Permitted		0.97	1.00	0.95	0.97		0.28	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1650		525	3539	1452		3227	
Volume (vph)	12	6	95	582	63	53	137	469	240	22	550	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	6	100	613	66	56	144	515	253	23	579	63
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	156	0	7	0
Lane Group Flow (vph)	0	19	6	377	352	0	144	515	97	0	658	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	741		201	1358	557		1238	
v/s Ratio Prot		c0.01		c0.22	0.21			0.15				
v/s Ratio Perm			0.00				c0.27		0.07		0.20	
v/c Ratio		0.17	0.06	0.50	0.47		0.72	0.38	0.17		0.53	
Uniform Delay, d1		49.3	49.0	21.5	21.2		28.8	24.5	22.4		26.2	
Progression Factor		1.00	1.00	0.25	0.23		1.17	0.83	1.53		1.00	
Incremental Delay, d2		0.6	0.2	2.2	2.0		5.9	0.2	0.2		1.6	
Delay (s)		49.8	49.2	7.0	6.9		39.5	20.5	34.5		27.9	
Level of Service		D	D	A	A		D	C	C		C	
Approach Delay (s)		49.3		7.2				27.4			27.9	
Approach LOS		D		A				C			C	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	223	37	447	710	240	252
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	39	471	754	253	265
RTOR Reduction (vph)	0	22	0	0	0	130
Lane Group Flow (vph)	235	17	471	754	253	135
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	19.6	47.7	24.4	83.2	65.3	19.6
Effective Green, g (s)	19.3	47.2	23.9	82.7	64.8	19.3
Actuated g/C Ratio	0.18	0.43	0.22	0.75	0.59	0.18
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	311	679	746	1401	928	278
v/s Ratio Prot	c0.13	0.01	c0.14	c0.40	0.14	0.09
v/s Ratio Perm						
v/c Ratio	0.76	0.02	0.63	0.54	0.27	0.48
Uniform Delay, d1	43.1	18.1	39.1	5.7	16.0	40.9
Progression Factor	0.61	0.15	0.97	0.18	1.00	1.00
Incremental Delay, d2	9.5	0.0	1.5	1.3	0.7	1.3
Delay (s)	35.7	2.8	39.4	2.3	16.8	42.2
Level of Service	D	A	D	A	B	D
Approach Delay (s)	31.1		16.5	29.8		
Approach LOS	C		B	C		

Intersection Summary				
HCM Average Control Delay	21.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.95	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1863	1583	1681		1770	3539	1583	1770	1828	
Flt Permitted		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1863	1583	1681		1770	3539	1583	1770	1828	
Volume (vph)	172	370	60	676	14	0	11	696	1394	269	566	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	711	15	0	12	733	1467	283	596	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	357	372	0	12	733	1467	283	643	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												15
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.2	16.2	16.2	22.8	22.8		1.2	23.8	96.2	17.9	40.5	
Effective Green, g (s)	15.7	15.7	15.7	22.8	22.8		0.7	24.3	96.2	17.4	41.0	
Actuated g/C Ratio	0.16	0.16	0.16	0.24	0.24		0.01	0.25	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	289	304	258	398	400		13	894	1583	320	779	
v/s Ratio Prot	0.10	c0.21		0.21	0.22		0.01	0.21		0.16	0.35	
v/s Ratio Perm			0.03						c0.93			
v/c Ratio	0.63	1.28	0.18	0.90	0.93		0.92	0.82	0.93	0.88	0.83	
Uniform Delay, d1	37.5	40.2	34.7	35.6	35.9		47.7	33.9	0.0	38.4	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.0	148.7	0.1	22.0	28.1		205.3	5.8	10.8	23.3	7.0	
Delay (s)	40.6	189.0	34.8	57.5	64.0		253.0	39.7	10.8	61.7	31.4	
Level of Service	D	F	C	E	E		F	D	B	E	C	
Approach Delay (s)		131.2		60.8				21.7			40.6	
Approach LOS		F		E				C			D	

Intersection Summary				
HCM Average Control Delay	47.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	96.2	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	89.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2944	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2944	1399				3433		1583
Volume (vph)	140	403	575	0	522	1660	0	0	0	1016	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	1958	0	0	0	1069	0	347
RTOR Reduction (vph)	0	234	0	0	226	0	0	0	0	0	0	178
Lane Group Flow (vph)	147	795	0	0	3080	1201	0	0	0	1069	0	169
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	66.3			42.3	110.0				35.2		35.2
Effective Green, g (s)	20.0	66.3			42.3	110.0				35.7		35.7
Actuated g/C Ratio	0.18	0.60			0.38	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.6		2.6
Lane Grp Cap (vph)	322	1945			1132	1399				1114		514
v/s Ratio Prot	0.08	0.25			c0.37							0.11
v/s Ratio Perm						c0.86				c0.31		
v/c Ratio	0.46	0.41			1.00dr	0.86				0.96		0.33
Uniform Delay, d1	40.2	11.5			32.9	0.0				36.4		28.1
Progression Factor	1.00	1.00			0.74	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.8			2.6	0.7				17.8		0.3
Delay (s)	40.6	12.2			27.0	0.7				54.9		28.4
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.7			14.4			0.0		47.9		
Approach LOS		B			B			A		D		

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1514	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1514	659			
Volume (vph)	142	1276	0	0	1812	425	571	226	1119	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1343	0	0	1907	447	601	238	1178	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	270	0	81	6	0	0	0
Lane Group Flow (vph)	149	1343	0	0	1907	177	601	746	583	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	585	509	335			
v/s Ratio Prot	0.08	c0.38			c0.41		0.36	0.49	c0.88			
v/s Ratio Perm						0.13						
v/c Ratio	0.44	0.90			1.13	0.36	1.06	1.47	1.74			
Uniform Delay, d1	39.3	29.8			35.0	25.8	38.5	38.5	27.0			
Progression Factor	1.56	0.36			0.92	1.33	1.00	1.00	1.00			
Incremental Delay, d2	2.3	5.5			62.3	0.9	55.9	220.2	344.8			
Delay (s)	63.5	16.2			94.4	35.0	92.4	256.7	371.8			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		20.9			83.1			241.4			0.0	
Approach LOS		C			F			F			A	

Intersection Summary				
HCM Average Control Delay	121.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1808	2628
Flt Permitted	0.95	1.00	1.00	0.96	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1808	2628
Volume (vph)	595	1021	779	326	1174	262	132	16	66	256	163	824
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	626	1075	820	342	1236	297	139	17	69	269	172	867
RTOR Reduction (vph)	0	3	136	0	0	33	0	0	60	0	0	86
Lane Group Flow (vph)	626	1120	636	342	1236	264	76	80	9	0	440	781
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.18	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.24	0.30
v/s Ratio Perm						0.17			0.01			
v/c Ratio	1.18	1.11	1.13	1.25	1.16	0.56	0.36	0.37	0.04		0.89	0.70
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	32.3	43.9	44.0	42.1		38.4	25.7
Progression Factor	1.21	1.05	1.13	1.06	1.07	1.19	1.02	1.03	2.10		1.04	0.74
Incremental Delay, d2	82.5	51.2	59.2	133.0	62.0	3.6	0.7	0.7	0.1		19.1	3.1
Delay (s)	139.0	91.5	92.4	182.4	123.2	40.2	45.6	45.8	88.7		56.9	22.1
Level of Service	F	F	F	F	F	D	D	D	F		E	C
Approach Delay (s)		103.6			120.8			58.9			34.5	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	92.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	97.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1810	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1810	3362	2787					3526			1863	
Volume (vph)	121	156	824	0	0	0	0	1140	25	0	277	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1200	26	0	292	0
RTOR Reduction (vph)	0	0	213	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	187	654	0	0	0	0	1225	0	0	292	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.0					66.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2088			610	
v/s Ratio Prot	0.05	0.06	c0.23					c0.35			0.16	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.39					0.59			0.48	
Uniform Delay, d1	25.4	25.4	11.5					14.4			29.5	
Progression Factor	1.26	1.24	1.00					1.00			1.29	
Incremental Delay, d2	0.6	0.3	0.1					1.3			2.6	
Delay (s)	32.6	31.8	22.6					15.7			40.7	
Level of Service	C	C	C					B			D	
Approach Delay (s)		25.0			0.0			15.7			40.7	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3371		1770	3479		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3371		1770	3479		1770	1846		1770	1863	1539
Volume (vph)	190	794	251	20	712	56	525	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	836	264	21	749	59	553	537	28	72	256	160
RTOR Reduction (vph)	0	26	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1074	0	21	802	0	658	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	947		34	727		677	707		304	320	264
v/s Ratio Prot	0.11	c0.32		0.01	c0.23		c0.31	0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.13		0.62	1.10		0.82	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.6		53.6	43.5		30.5	30.2		39.3	43.7	38.4
Progression Factor	1.27	0.92		1.00	1.00		1.01	1.01		1.23	1.18	2.49
Incremental Delay, d2	147.7	72.6		29.0	65.5		7.3	6.0		0.4	12.3	0.2
Delay (s)	211.3	108.6		82.5	109.0		38.0	36.5		48.6	64.1	95.7
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		124.6			108.3			37.2			72.2	
Approach LOS		F			F			D			E	

Intersection Summary			
HCM Average Control Delay	88.0	HCM Level of Service	F
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3416		1770	3480		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3418		1770	3480		1770	3491		1770	3477	
Volume (vph)	151	856	194	102	480	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	691	204	107	505	64	188	1279	129	118	1109	147
RTOR Reduction (vph)	0	30	0	0	11	0	0	6	0	0	11	0
Lane Group Flow (vph)	159	865	0	107	558	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.9		6.3	22.5		12.9	31.9		9.9	28.9	
Effective Green, g (s)	9.7	25.4		7.3	23.0		11.9	32.4		8.9	29.4	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	965		144	889		234	1257		175	1136	
v/s Ratio Prot	c0.09	c0.25		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.90		0.74	0.63		0.80	1.11		0.67	1.10	
Uniform Delay, d1	39.4	31.0		40.4	29.7		37.9	28.8		39.2	30.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	10.8		18.6	1.4		17.8	62.7		9.8	57.0	
Delay (s)	64.8	41.8		59.0	31.1		55.7	91.5		49.0	87.3	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		45.3			35.5			87.3			84.0	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	69.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3384		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3384		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	867	225	80	682	65	249	132	124	96	182	18
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	702	237	84	718	68	262	139	131	101	192	20
RTOR Reduction (vph)	0	27	0	0	0	34	0	37	0	0	2	0
Lane Group Flow (vph)	27	912	0	84	718	34	262	233	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			1
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	37.8		7.6	41.2	41.2	19.1	19.1			21.0	
Effective Green, g (s)	3.7	37.8		7.1	41.2	41.2	18.6	18.6			20.5	
Actuated g/C Ratio	0.04	0.38		0.07	0.41	0.41	0.19	0.19			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1279		126	1458	627	329	315			372	
v/s Ratio Prot	0.02	c0.27		c0.05	c0.20		c0.15	0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.71		0.67	0.49	0.04	0.80	0.74			0.83	
Uniform Delay, d1	47.1	28.5		45.3	21.7	17.6	38.9	38.4			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	3.4		11.4	1.2	0.1	12.2	8.3			14.6	
Delay (s)	50.2	29.9		56.7	22.9	17.7	51.1	46.7			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		30.5			25.8			48.8			52.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3539	1495	1770	1863	1520	1770	1824	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3431		1770	3539	1495	1770	1863	1520	1770	1824	
Volume (vph)	46	674	135	141	503	232	218	326	133	261	428	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	142	148	614	244	229	343	140	275	451	54
RTOR Reduction (vph)	0	16	0	0	0	149	0	0	100	0	4	0
Lane Group Flow (vph)	48	835	0	148	614	95	229	343	40	275	501	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.2		11.9	38.8	38.8	12.5	28.9	28.9	12.5	28.9	
Effective Green, g (s)	4.8	32.2		11.4	38.8	38.8	12.0	28.4	28.4	12.0	28.4	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.28	0.28	0.12	0.28	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1105		202	1373	580	212	529	432	212	518	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.13	0.18		c0.16	c0.27	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.76		0.73	0.45	0.16	1.08	0.65	0.09	1.30	0.97	
Uniform Delay, d1	46.6	30.4		42.8	22.7	20.0	44.0	31.4	26.3	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.95	
Incremental Delay, d2	6.8	4.8		12.2	1.1	0.6	84.8	2.4	0.1	160.8	28.5	
Delay (s)	53.4	35.2		55.0	23.7	20.6	128.8	33.8	26.4	203.7	61.0	
Level of Service	D	D		D	C	C	F	C	C	F	E	
Approach Delay (s)		36.2			27.6			62.9			111.9	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM Average Control Delay	56.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	992	44	96	954	12	33	12	86	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1044	46	101	1004	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			328							
pX, platoon unblocked												
vC, conflicting volume	1017			1091			1832	2333	545	1891	2349	508
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1017			1091			1832	2333	545	1891	2349	508
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	57	79	100	71	98
cM capacity (veh/h)	578			636			31	30	482	19	29	510

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	696	394	101	669	347	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	678	1700	1700	636	1700	1700	31	256	58
Volume to Capacity	0.03	0.41	0.23	0.16	0.39	0.20	1.33	0.43	0.31
Queue Length 95th (ft)	3	0	0	14	0	0	115	50	28
Control Delay (s)	10.5	0.0	0.0	11.7	0.0	0.0	470.9	29.2	93.5
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			149.7		93.5
Approach LOS							F		F

Intersection Summary				
Average Delay	10.7			
Intersection Capacity Utilization	52.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3429		1770	3490			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3429		1770	3490			1809	1555		1813	
Volume (vph)	30	942	159	158	871	57	189	130	286	27	138	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	992	167	166	917	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1147	0	166	973	0	0	336	91	0	189	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						

Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.8	
Actuated g/C Ratio	0.06	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1221		221	1393			385	331		265	
v/s Ratio Prot	0.02	c0.33		0.09	c0.28			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.94		0.75	0.70			0.87	0.27		0.71	
Uniform Delay, d1	42.9	31.2		42.2	25.0			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.47	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	14.9		1.3	0.3			18.9	0.3		8.2	
Delay (s)	43.5	46.0		63.7	15.7			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		45.9			20.8			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	37.0	HCM Level of Service		D
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0
Intersection Capacity Utilization	86.0%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3296		1770	3374		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3296		1770	3374		3433	3531		1770	3479	
Volume (vph)	207	678	374	47	494	180	495	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	714	394	49	520	189	521	1266	16	281	1236	107
RTOR Reduction (vph)	0	74	0	0	37	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1034	0	49	672	0	521	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10

Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	936		81	641		446	1285		258	1322	
v/s Ratio Prot	c0.12	c0.31		0.03	0.20		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.10		0.60	1.05		1.17	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.86		1.01	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.4	56.2		7.8	47.4		97.4	24.4		81.9	27.5	
Delay (s)	44.0	86.8		55.3	85.5		140.9	56.2		124.6	58.5	
Level of Service	D	F		E	F		F	E		F	E	
Approach Delay (s)		79.4			83.6			80.7			70.0	
Approach LOS		E			F			F			E	

Intersection Summary				
HCM Average Control Delay	77.6	HCM Level of Service		E
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	98.2%	ICU Level of Service		F
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3452			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3452			3117			2416	
Volume (vph)	22	821	17	45	579	97	19	292	107	81	229	116
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	864	18	47	609	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	20	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	880	0	47	691	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2

Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1906			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.48		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.6		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.24		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.0	9.5		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.3			8.2			20.5			28.5	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service		B
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	74.4%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	379	89	11	86	103	46	19	83	50	65	59	309
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	399	94	12	91	108	48	20	87	53	68	62	325
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	399	105	247	160	456							
Volume Left (vph)	399	0	91	20	68							
Volume Right (vph)	0	12	48	53	325							
Hadj (s)	0.53	0.04	-0.01	-0.14	-0.38							
Departure Headway (s)	7.9	7.3	7.5	7.7	6.6							
Degree Utilization, x	0.87	0.21	0.52	0.34	0.83							
Capacity (veh/h)	446	481	429	415	523							
Control Delay (s)	43.8	11.1	18.3	14.7	34.0							
Approach Delay (s)	37.0		18.3	14.7	34.0							
Approach LOS	E		C	B	D							
Intersection Summary												
Delay			30.0									
HCM Level of Service			D									
Intersection Capacity Utilization			80.3%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery Street

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↠			↟	↱	↰	↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.96	1.00		0.80			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	66	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			8			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.6			32.5			12.4			10.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			17.9		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			63.3		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			82.1%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↟↟			↟↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	332	32	121	216	36	0	1443	92	0	1500	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1519	97	0	1579	106
RTOR Reduction (vph)	0	5	0	0	6	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1612	0	0	1681	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.82			0.85	
Uniform Delay, d1		43.5			42.5			18.6			19.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.9			4.9	
Delay (s)		109.8			47.1			22.5			24.3	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.5			24.3	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM Average Control Delay			36.0		HCM Level of Service				D			
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			78.8%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↟↑	↱		↟↑			↟↟↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3514	1583		3531			5075	
Flt Permitted					0.99	1.00		0.77			1.00	
Satd. Flow (perm)					3514	1583		2714			5075	
Volume (vph)	0	0	0	84	385	732	49	1004	0	0	1519	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1057	0	0	1599	22
RTOR Reduction (vph)	0	0	0	0	0	78	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	693	0	1109	0	0	1619	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1659			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.41				
v/c Ratio					0.45	1.46		0.67			0.52	
Uniform Delay, d1					25.5	31.5		11.5			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	218.2		2.2			0.6	
Delay (s)					25.6	249.7		13.7			10.6	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			164.6			13.7			10.6	
Approach LOS		A			F			B			B	
Intersection Summary												
HCM Average Control Delay			59.6		HCM Level of Service				E			
HCM Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			81.5%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3500		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3500		3433	3539	
Volume (vph)	28	703	76	0	0	0	0	971	78	749	870	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	80	0	0	0	0	1022	82	788	916	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1099	0	788	916	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1324		869	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.83		0.89	0.38	
Uniform Delay, d1		40.4						31.0		39.2	7.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						6.1		10.3	0.0	
Delay (s)		60.4						37.1		49.5	7.9	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			37.1			27.2	
Approach LOS		E			A			D			C	

Intersection Summary				
HCM Average Control Delay	37.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	0	105	13	1	0	3	192	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	209	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					673							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	465	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	485	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	80	100	99	100
cM capacity (veh/h)	1604			1605			645	602	1057	364	605	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	212	12
Volume Left	0	114	0	1
Volume Right	0	1	209	3
cSH	1604	1605	1055	646
Volume to Capacity	0.00	0.07	0.20	0.02
Queue Length 95th (ft)	0	6	19	1
Control Delay (s)	0.0	8.7	9.3	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	8.7	9.3	10.7
Approach LOS			A	B

Intersection Summary				
Average Delay	8.1			
Intersection Capacity Utilization	31.9%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.91			0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1702			1763		1770	1845	
Flt Permitted	0.63	1.00		0.72	1.00			0.99		0.21	1.00	
Satd. Flow (perm)	1167	1802		1332	1702			1744		393	1845	
Volume (vph)	127	46	13	226	67	91	13	457	300	83	555	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	50	14	246	73	99	14	497	326	90	603	42
RTOR Reduction (vph)	0	10	0	0	71	0	0	38	0	0	4	0
Lane Group Flow (vph)	138	54	0	246	101	0	0	799	0	90	641	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	16.8	16.8		16.8	16.8			28.0		35.2	35.2	
Effective Green, g (s)	16.8	16.8		16.8	16.8			28.0		35.2	35.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.47		0.59	0.59	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	327	505		373	477			814		304	1082	
v/s Ratio Prot		0.03			0.06					0.02	c0.35	
v/s Ratio Perm	0.12			c0.18				c0.46		0.16		
v/c Ratio	0.42	0.11		0.66	0.21			0.98		0.30	0.59	
Uniform Delay, d1	17.6	16.0		19.1	16.5			15.7		8.7	7.9	
Progression Factor	1.00	1.00		1.08	1.16			1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.4		8.7	1.0			26.8		0.5	0.9	
Delay (s)	21.6	16.5		29.2	20.2			42.5		9.2	8.7	
Level of Service	C	B		C	C			D		A	A	
Approach Delay (s)		20.0			25.5			42.5			8.8	
Approach LOS		B			C			D			A	

Intersection Summary				
HCM Average Control Delay	25.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Alt#3 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕		↰	↕	↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1830		1770	1863	1746	
Flt Permitted	1.00		0.95	1.00	0.96	
Satd. Flow (perm)	1830		1770	1863	1746	
Volume (vph)	155	23	39	169	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	25	42	184	65	14
RTOR Reduction (vph)	4	0	0	0	13	0
Lane Group Flow (vph)	189	0	42	184	66	0
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	39.7		3.1	46.8	5.2	
Effective Green, g (s)	39.7		3.1	46.8	5.2	
Actuated g/C Ratio	0.66		0.05	0.78	0.09	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1211		91	1453	151	
v/s Ratio Prot	c0.10		c0.02	0.10	c0.04	
v/s Ratio Perm						
v/c Ratio	0.16		0.46	0.13	0.44	
Uniform Delay, d1	3.8		27.6	1.6	26.0	
Progression Factor	0.78		1.00	1.00	1.00	
Incremental Delay, d2	0.2		3.7	0.2	2.0	
Delay (s)	3.1		31.3	1.8	28.0	
Level of Service	A		C	A	C	
Approach Delay (s)	3.1			7.3	28.0	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	9.0	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	27.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	176	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	191	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	289	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	0.49	0.10	-0.15	0.04
Departure Headway (s)	4.4	4.9	4.2	4.6
Degree Utilization, x	0.02	0.15	0.34	0.12
Capacity (veh/h)	727	682	834	746
Control Delay (s)	7.5	8.7	9.3	8.2
Approach Delay (s)	7.5	8.7	9.3	8.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay			8.9	
HCM Level of Service			A	
Intersection Capacity Utilization		36.1%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	130	36	28	693	636	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	39	30	742	693	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.76	0.76	0.76			
vC, conflicting volume	1585	782	871			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1771	713	830			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	68	95			
cM capacity (veh/h)	66	328	609			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	180	30	742	871
Volume Left	141	30	0	0
Volume Right	39	0	0	177
cSH	80	609	1700	1700
Volume to Capacity	2.26	0.05	0.44	0.51
Queue Length 95th (ft)	416	4	0	0
Control Delay (s)	690.4	11.2	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	690.4	0.4	0.0	
Approach LOS	F			

Intersection Summary				
Average Delay		68.5		
Intersection Capacity Utilization		69.6%	ICU Level of Service	B
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1643		1770	3539	1489		3491	
Flt Permitted		0.97	1.00	0.95	0.97		0.18	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1643		338	3539	1489		3218	
Volume (vph)	31	22	138	820	78	72	151	602	416	26	633	65
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	891	85	78	164	548	454	27	688	80
RTOR Reduction (vph)	0	0	37	0	6	0	0	0	224	0	5	0
Lane Group Flow (vph)	0	58	111	545	603	0	164	548	230	0	770	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	37.6	37.6		36.4	36.4	36.4		36.4	
Effective Green, g (s)		24.5	24.5	37.6	37.6		35.9	35.9	35.9		35.9	
Actuated g/C Ratio		0.22	0.22	0.34	0.34		0.33	0.33	0.33		0.33	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	575	562		110	1155	486		1050	
v/s Ratio Prot		0.03		c0.32	0.37			0.15				
v/s Ratio Perm			c0.07				c0.49		0.15		0.24	
v/c Ratio		0.14	0.32	0.95	0.90		1.49	0.47	0.47		0.73	
Uniform Delay, d1		34.3	35.7	35.2	34.3		37.0	29.5	29.5		32.8	
Progression Factor		1.00	1.00	0.54	0.53		0.46	0.43	0.43		1.00	
Incremental Delay, d2		0.7	2.3	22.8	15.0		225.3	0.1	0.3		4.5	
Delay (s)		35.1	38.1	42.0	33.1		241.9	12.7	13.1		37.3	
Level of Service		D	D	D	C		F	B	B		D	
Approach Delay (s)		37.2			37.7			45.2			37.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay		40.3	HCM Level of Service	D
HCM Volume to Capacity ratio		0.99		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		86.3%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	377	72	855	961	304	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	78	712	1034	330	359
RTOR Reduction (vph)	0	36	0	0	0	23
Lane Group Flow (vph)	410	42	712	1034	330	336
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	28.5	59.9	27.9	74.5	43.1	75.1
Effective Green, g (s)	28.0	59.4	27.4	74.0	42.6	74.6
Actuated g/C Ratio	0.25	0.54	0.25	0.67	0.39	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	451	855	855	1253	721	1074
v/s Ratio Prot	c0.23	0.03	0.21	c0.56	0.18	0.21
v/s Ratio Perm						
v/c Ratio	0.91	0.05	0.83	0.83	0.46	0.31
Uniform Delay, d1	39.8	12.0	39.1	13.2	25.1	7.2
Progression Factor	0.50	0.44	0.55	1.67	1.00	1.00
Incremental Delay, d2	18.2	0.0	3.5	3.1	2.1	0.2
Delay (s)	38.2	5.3	25.2	27.8	27.2	7.4
Level of Service	D	A	C	C	C	A
Approach Delay (s)	32.9			26.8	16.9	
Approach LOS	C			C	B	

Intersection Summary				
HCM Average Control Delay		25.5	HCM Level of Service	C
HCM Volume to Capacity ratio		0.85		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		77.6%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Volume (vph)	26	21	7	1008	13	16	41	306	1299	135	447	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	1096	14	17	45	333	1412	147	486	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	572	554	0	45	333	1412	147	517	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		6	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.5	3.5	3.5	25.9	25.9		3.5	20.7	73.8	6.2	25.4	
Effective Green, g (s)	3.0	3.0	3.0	25.9	25.9		3.5	20.7	73.8	6.2	25.4	
Actuated g/C Ratio	0.04	0.04	0.04	0.35	0.35		0.05	0.28	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	64	590	590		84	993	1583	197	632	
v/s Ratio Prot	0.02	0.01		0.34	0.33		0.03	0.09		0.08	0.28	
v/s Ratio Perm			0.00						c0.89			
v/c Ratio	0.39	0.30	0.01	0.97	0.94		0.54	0.34	0.89	0.75	0.82	
Uniform Delay, d1	34.5	34.4	34.0	23.6	23.2		34.4	21.1	0.0	31.8	22.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	29.1	22.7		3.3	0.1	8.1	12.6	7.9	
Delay (s)	35.8	35.2	34.0	52.7	45.9		37.6	21.2	8.1	44.4	30.0	
Level of Service	D	D	C	D	D		D	C	A	D	C	
Approach Delay (s)		35.3			49.3			11.2			33.2	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	27.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			2947	1399				3433		1583
Flt Permitted	0.86	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			2947	1399				3433		1583
Volume (vph)	113	281	1	0	350	1644	0	0	0	1231	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	380	1678	0	0	0	1338	0	263
RTOR Reduction (vph)	0	0	0	0	191	0	0	0	0	0	0	115
Lane Group Flow (vph)	123	306	0	0	726	1151	0	0	0	1338	0	148
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	6	2			8					4		4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	55.2			39.8	110.0				46.3		46.3
Effective Green, g (s)	11.3	55.2			39.8	110.0				46.8		46.8
Actuated g/C Ratio	0.10	0.50			0.36	1.00				0.43		0.43
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1775			1089	1399				1461		673
v/s Ratio Prot	0.07	0.09			0.25					c0.39		0.09
v/s Ratio Perm						c0.82						
v/c Ratio	0.68	0.17			0.66	0.82				0.92		0.22
Uniform Delay, d1	47.6	14.9			29.6	0.0				29.7		20.0
Progression Factor	1.00	1.00			1.13	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.5	2.4				9.2		0.1
Delay (s)	55.2	15.2			34.3	2.4				39.0		20.2
Level of Service	E	B			C	A				D		C
Approach Delay (s)		26.6			16.6			0.0			35.9	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	25.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1449	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1449	659			
Volume (vph)	111	1400	0	0	1617	426	386	21	1309	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1522	0	0	1649	463	420	23	1423	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	296	0	161	1	0	0	0
Lane Group Flow (vph)	121	1522	0	0	1649	167	420	573	711	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						6						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.8	37.0			39.7	39.7	48.0	48.0	65.0			
Effective Green, g (s)	10.3	37.0			39.7	39.7	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	166	1197			1674	526	734	632	389			
v/s Ratio Prot	0.07	c0.43			c0.36		0.25	0.40	c1.08			
v/s Ratio Perm						0.11						
v/c Ratio	0.73	1.27			0.99	0.32	0.57	0.91	1.83			
Uniform Delay, d1	48.5	36.5			34.9	25.4	23.3	28.9	22.5			
Progression Factor	1.24	0.59			0.95	1.18	1.00	1.00	1.00			
Incremental Delay, d2	8.9	126.8			13.5	0.9	3.2	19.1	382.7			
Delay (s)	69.2	148.3			46.6	30.9	26.5	48.0	405.2			
Level of Service	E	F			D	C	C	D	F			
Approach Delay (s)		142.5			43.2			179.5			0.0	
Approach LOS		F			D			F			A	

Intersection Summary				
HCM Average Control Delay	117.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.86
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1816	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1816	2628
Volume (vph)	699	759	1251	360	668	295	227	62	101	289	270	1041
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	760	825	1360	391	726	321	247	67	110	314	293	1132
RTOR Reduction (vph)	0	120	65	0	0	65	0	0	98	0	0	34
Lane Group Flow (vph)	760	1331	649	391	726	233	153	161	12	0	607	1098
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.22	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.33	0.42
v/s Ratio Perm						0.15			0.01			
v/c Ratio	1.28	1.35	1.25	1.39	0.68	0.51	0.84	0.86	0.07		1.23	0.87
Uniform Delay, d1	45.5	37.5	31.5	46.5	33.9	31.8	48.0	48.2	44.0		40.0	25.4
Progression Factor	1.25	1.03	1.00	1.00	1.00	1.00	1.26	1.26	2.47		0.93	0.75
Incremental Delay, d2	128.0	167.5	111.8	195.1	3.6	4.0	23.7	26.6	0.1		112.5	5.1
Delay (s)	184.8	196.2	145.8	241.6	37.5	35.9	84.3	87.3	108.7		149.8	24.2
Level of Service	F	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		180.7			91.5			91.6			68.0	
Approach LOS		F			F			F			E	

Intersection Summary				
HCM Average Control Delay	125.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.30			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	114.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1572	21	0	378	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1709	23	0	411	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1731	0	0	411	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.49			0.22	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.93			0.48	
Uniform Delay, d1	21.7	21.7	26.3					24.1			20.6	
Progression Factor	1.03	1.04	1.10					0.56			0.53	
Incremental Delay, d2	0.7	0.3	5.7					7.1			1.8	
Delay (s)	23.0	22.8	34.5					20.5			12.7	
Level of Service	C	C	C					C			B	
Approach Delay (s)		31.5			0.0			20.5			12.7	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	74.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Volume (vph)	86	615	342	38	742	36	282	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	668	372	41	807	39	307	238	24	39	250	103
RTOR Reduction (vph)	0	102	0	0	5	0	0	5	0	0	0	83
Lane Group Flow (vph)	93	938	0	41	841	0	307	257	0	39	250	20
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.7		2.3	18.0		14.1	14.1		12.8	12.8	12.8
Effective Green, g (s)	4.0	19.7		2.3	18.0		14.1	14.1		12.8	12.8	12.8
Actuated g/C Ratio	0.06	0.30		0.04	0.28		0.22	0.22		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	109	1012		63	973		385	398		349	367	305
v/s Ratio Prot	c0.05	c0.28		0.02	0.24		c0.17	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.93		0.65	0.86		0.80	0.64		0.11	0.68	0.07
Uniform Delay, d1	30.2	21.9		30.9	22.9		24.0	23.1		21.4	24.2	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.8	13.8		21.5	8.1		10.9	3.6		0.1	5.1	0.1
Delay (s)	74.0	35.7		52.4	30.4		35.0	26.7		21.5	29.3	21.3
Level of Service	F	D		D	C		C	C		C	C	C
Approach Delay (s)		38.8			31.4			31.2			26.4	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	33.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3436		1770	3519			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3436		1770	3519			1802	1555		1774	
Volume (vph)	18	1040	164	175	1118	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1130	178	190	1215	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	198	0	13	0
Lane Group Flow (vph)	20	1299	0	190	1246	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1519		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.38		c0.11	0.35			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.85		0.97	0.65			0.78	0.15		0.22	
Uniform Delay, d1	49.4	25.0		44.3	16.2			39.8	35.7		39.7	
Progression Factor	1.05	0.54		0.81	0.68			1.00	1.00		1.00	
Incremental Delay, d2	217.2	6.0		23.5	0.4			9.9	0.2		0.4	
Delay (s)	268.9	19.4		59.2	11.4			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		23.2			17.7			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

2010 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.97		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3085		1770	3364		3433	3511		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3065		1770	3364		3433	3511		1770	3339	
Volume (vph)	167	650	422	72	541	102	572	909	25	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	716	459	78	588	111	622	988	27	160	1017	200
RTOR Reduction (vph)	0	102	0	0	15	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1072	0	78	684	0	622	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	990		83	817		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.35		0.04	0.20		c0.18	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.08		0.94	0.84		1.13	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.8		47.5	36.0		42.0	29.4		42.9	34.5	
Progression Factor	1.17	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.4	49.0		77.0	10.0		80.6	6.1		15.0	82.9	
Delay (s)	62.3	63.4		124.5	45.9		122.6	35.5		57.8	117.4	
Level of Service	E	E		F	D		F	D		E	F	
Approach Delay (s)		63.2			53.8			68.6			110.5	
Approach LOS		E			D			E			F	

Intersection Summary				
HCM Average Control Delay	76.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.12			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	100.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #3
2030

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3381		1770	3502		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3381		1770	3502		1770	3436		1770	1863	1583
Volume (vph)	577	881	372	118	778	59	121	271	66	66	273	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	392	124	819	62	127	285	69	72	287	214
RTOR Reduction (vph)	0	40	0	0	5	0	0	20	0	0	0	178
Lane Group Flow (vph)	607	1279	0	124	876	0	127	334	0	72	287	36
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	49.2		11.0	25.2		14.3	14.3		16.5	16.5	16.5
Effective Green, g (s)	35.0	50.2		11.0	26.2		14.3	14.3		16.5	16.5	16.5
Actuated g/C Ratio	0.32	0.46		0.10	0.24		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1543		177	834		230	447		298	313	266
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.15	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.83		0.70	1.05		0.55	0.75		0.24	0.92	0.14
Uniform Delay, d1	37.5	26.1		47.9	41.9		44.8	46.1		39.7	45.0	38.9
Progression Factor	1.00	1.00		0.88	1.16		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.3		4.5	33.8		2.3	6.4		0.4	30.1	0.2
Delay (s)	98.2	31.4		46.7	82.6		47.1	52.5		40.1	75.1	39.2
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		52.5			78.1			51.1			57.3	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM Average Control Delay	59.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3420		1770	3480		1770	3460	
Flt Permitted	0.19	1.00			0.62		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	355	3451			2134		1770	3480		1770	3460	
Volume (vph)	123	746	146	88	602	162	218	799	100	119	888	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	154	93	634	171	229	841	105	125	935	164
RTOR Reduction (vph)	0	16	0	0	19	0	0	9	0	0	13	0
Lane Group Flow (vph)	129	923	0	0	879	0	229	937	0	125	1086	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	46.6	46.6			46.6		15.7	34.4		16.0	34.7	
Effective Green, g (s)	46.6	46.6			46.6		15.7	35.4		16.0	35.7	
Actuated g/C Ratio	0.42	0.42			0.42		0.14	0.32		0.15	0.32	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	150	1462			904		253	1120		257	1123	
v/s Ratio Prot		0.27					0.13	c0.27		0.07	c0.31	
v/s Ratio Perm	0.36				c0.41							
v/c Ratio	0.86	0.63			0.97		0.91	0.84		0.49	0.97	
Uniform Delay, d1	28.7	25.0			31.1		46.4	34.6		43.2	36.6	
Progression Factor	0.39	0.41			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.6	0.5			23.2		32.4	7.5		1.5	20.0	
Delay (s)	35.8	10.7			54.3		79.0	42.1		44.7	56.6	
Level of Service	D	B			D		E	D		D	E	
Approach Delay (s)		15.7			54.3			49.3			55.4	
Approach LOS		B			D			D			E	

Intersection Summary			
HCM Average Control Delay	43.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	111	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	117	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	470	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	470	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	89	100	100	100
cM capacity (veh/h)	1545			1616			559	520	1079	418	520	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	204	119	1
Volume Left	0	145	2	0
Volume Right	2	1	117	0
cSH	1545	1616	1082	520
Volume to Capacity	0.00	0.09	0.11	0.00
Queue Length 95th (ft)	0	7	9	0
Control Delay (s)	0.0	5.5	8.8	11.9
Lane LOS		A	A	B
Approach Delay (s)	0.0	5.5	8.8	11.9
Approach LOS			A	B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.88			0.95		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1632			1763		1770	1777	
Flt Permitted	0.55	1.00		0.71	1.00			0.98		0.32	1.00	
Satd. Flow (perm)	1026	1842		1326	1632			1704		600	1777	
Volume (vph)	76	61	5	95	47	222	11	130	66	120	344	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	64	5	100	49	234	12	137	61	126	362	160
RTOR Reduction (vph)	0	3	0	0	120	0	0	43	0	0	36	0
Lane Group Flow (vph)	80	66	0	100	163	0	0	197	0	126	486	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	29.7	29.7		29.7	29.7			12.5		23.3	23.3	
Effective Green, g (s)	29.2	29.2		29.2	29.2			12.0		22.8	22.8	
Actuated g/C Ratio	0.49	0.49		0.49	0.49			0.20		0.38	0.38	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	499	896		645	794			341		361	675	
v/s Ratio Prot		0.04			c0.10					0.04	c0.27	
v/s Ratio Perm	0.08			0.08				0.12		0.09		
v/c Ratio	0.16	0.07		0.16	0.21			0.58		0.35	0.72	
Uniform Delay, d1	8.6	8.2		8.6	8.8			21.7		13.5	15.9	
Progression Factor	1.00	1.00		0.55	0.10			1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.2		0.5	0.6			2.4		0.8	3.8	
Delay (s)	9.3	8.4		5.2	1.5			24.1		14.1	19.7	
Level of Service	A	A		A	A			C		B	B	
Approach Delay (s)		8.6			2.4			24.1			18.6	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1762	
Flt Permitted	1.00		0.59	1.00	0.96	
Satd. Flow (perm)	1855		1093	1863	1762	
Volume (vph)	259	9	50	195	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	9	53	205	178	15
RTOR Reduction (vph)	1	0	0	0	8	0
Lane Group Flow (vph)	281	0	53	205	185	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	43.6		43.6	43.6	9.4	
Effective Green, g (s)	43.1		43.1	43.1	8.9	
Actuated g/C Ratio	0.72		0.72	0.72	0.15	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1333		785	1338	261	
v/s Ratio Prot	c0.15			0.11	c0.11	
v/s Ratio Perm			0.05			
v/c Ratio	0.21		0.07	0.15	0.71	
Uniform Delay, d1	2.8		2.5	2.7	24.3	
Progression Factor	0.96		1.00	1.00	1.00	
Incremental Delay, d2	0.4		0.2	0.2	8.8	
Delay (s)	3.0		2.7	2.9	33.1	
Level of Service	A		A	A	C	
Approach Delay (s)	3.0			2.9	33.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1827		1770	1851		1770	1815	
Flt Permitted		0.90			0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1573			1441		1770	1851		1770	1815	
Volume (vph)	79	90	132	37	80	4	36	338	14	23	524	108
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	95	139	39	84	4	38	356	15	24	552	114
RTOR Reduction (vph)	0	56	0	0	2	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	261	0	0	125	0	38	369	0	24	654	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		315			288		85	1003		32	929	
v/s Ratio Prot							c0.02	0.20		0.01	c0.36	
v/s Ratio Perm		c0.17			0.09							
v/c Ratio		0.83			0.43		0.45	0.37		0.75	0.70	
Uniform Delay, d1		19.2			17.5		23.2	6.5		24.4	9.3	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		15.9			0.8		2.7	1.0		62.8	4.5	
Delay (s)		35.1			18.3		23.4	8.5		87.2	13.8	
Level of Service		D			B		C	A		F	B	
Approach Delay (s)		35.1			18.3			9.9			16.3	
Approach LOS		D			B			A			B	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	110	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	116	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	205	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.14	0.01
Departure Headway (s)	4.5	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.24	0.16
Capacity (veh/h)	725	685	844	799
Control Delay (s)	7.6	8.4	8.4	8.3
Approach Delay (s)	7.6	8.4	8.4	8.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.3		
HCM Level of Service	A		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	79	24	23	166	398	45
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	25	24	175	420	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	867	444	467			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	643	403	429			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	96	98			
cM capacity (veh/h)	399	603	1054			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	108	24	175	467
Volume Left	83	24	0	0
Volume Right	25	0	0	47
cSH	433	1054	1700	1700
Volume to Capacity	0.25	0.02	0.10	0.27
Queue Length 95th (ft)	24	2	0	0
Control Delay (s)	16.1	8.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.1	1.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↔		↰	↑↑	↱		↓↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1663		1770	3539	1583		3523	
Flt Permitted		0.97	1.00	0.95	0.96		0.48	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1663		887	3539	1583		3320	
Volume (vph)	39	28	117	408	4	29	60	222	121	17	415	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	427	4	31	63	234	127	18	437	8
RTOR Reduction (vph)	0	0	116	0	6	0	0	0	43	0	1	0
Lane Group Flow (vph)	0	70	7	239	217	0	63	234	84	0	462	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	15.8	15.8		66.8	66.8	66.8		66.8	
Effective Green, g (s)		5.9	5.9	15.8	15.8		66.3	66.3	66.3		66.3	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	266	263		588	2346	1050		2201	
v/s Ratio Prot		c0.04		c0.14	0.13			0.07			c0.14	
v/s Ratio Perm			0.00				0.07		0.05			
v/c Ratio		0.65	0.08	0.90	0.83		0.11	0.10	0.08		0.21	
Uniform Delay, d1		46.1	44.5	41.3	40.8		6.1	6.1	6.0		6.6	
Progression Factor		1.00	1.00	1.52	1.54		0.06	0.06	0.00		1.00	
Incremental Delay, d2		12.1	0.3	29.1	18.1		0.3	0.1	0.1		0.2	
Delay (s)		59.2	44.7	92.0	80.8		0.7	0.8	0.1		6.8	
Level of Service		E	D	F	F		A	A	A		A	
Approach Delay (s)		49.8		86.6				0.6			6.8	
Approach LOS		D		F				A			A	

Intersection Summary			
HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰↰	↑	↓	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	83	38	285	213	154	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	40	300	224	162	213
RTOR Reduction (vph)	0	29	0	0	0	185
Lane Group Flow (vph)	87	11	300	224	162	28
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	9.9	28.2	14.0	83.1	64.8	9.9
Effective Green, g (s)	9.4	27.7	14.3	82.6	64.3	9.4
Actuated g/C Ratio	0.09	0.28	0.14	0.83	0.64	0.09
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	166	438	491	1539	1198	149
v/s Ratio Prot	c0.05	0.01	c0.09	c0.12	0.09	0.02
v/s Ratio Perm						
v/c Ratio	0.52	0.03	0.61	0.15	0.14	0.19
Uniform Delay, d1	43.2	26.3	40.2	1.7	7.0	41.8
Progression Factor	0.85	2.73	1.00	0.09	1.00	1.00
Incremental Delay, d2	2.9	0.0	2.2	0.2	0.2	0.6
Delay (s)	39.6	71.8	42.5	0.4	7.2	42.4
Level of Service	D	E	D	A	A	D
Approach Delay (s)	49.7			24.5	27.2	
Approach LOS	D			C	C	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↔		↰	↑↑	↱	↰	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1804	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1701		1770	3539	1583	1770	1804	
Volume (vph)	5	21	16	720	79	0	83	110	964	76	265	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	758	83	0	93	116	1015	80	279	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	409	432	0	93	116	1015	80	344	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.9	2.9	2.9	24.9	24.9		4.8	16.7	64.5	4.5	16.4	
Effective Green, g (s)	2.4	2.4	2.4	24.8	24.9		4.3	17.2	64.5	4.0	16.9	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.07	0.27	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	849	657		118	944	1583	110	473	
v/s Ratio Prot	0.00	0.01		0.24	0.25		0.05	0.03		0.05	0.19	
v/s Ratio Perm			0.00						c0.64			
v/c Ratio	0.08	0.32	0.01	0.63	0.66		0.79	0.12	0.64	0.73	0.73	
Uniform Delay, d1	30.0	30.3	29.9	16.1	16.3		29.7	17.9	0.0	29.7	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.7	2.1		26.6	0.0	2.0	18.2	5.2	
Delay (s)	30.2	31.2	29.9	17.8	18.4		56.3	18.0	2.0	48.0	26.8	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		30.6			18.1			7.6			30.7	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			0.99	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3288			3371	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3288			3371	1441				3433		1583
Volume (vph)	120	236	211	0	741	1152	0	0	0	844	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1213	0	0	0	888	0	151
RTOR Reduction (vph)	0	84	0	0	2	0	0	0	0	0	0	106
Lane Group Flow (vph)	126	386	0	0	808	1163	0	0	0	888	0	45
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	62.0			39.0	100.0				29.5		29.5
Effective Green, g (s)	19.0	62.0			39.0	100.0				30.0		30.0
Actuated g/C Ratio	0.19	0.62			0.39	1.00				0.30		0.30
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2039			1315	1441				1030		475
v/s Ratio Prot	0.07	0.12			0.24					0.26		
v/s Ratio Perm						c0.82						0.03
v/c Ratio	0.38	0.19			0.61	0.82				0.86		0.10
Uniform Delay, d1	35.3	8.2			24.5	0.0				33.0		25.2
Progression Factor	1.00	1.00			0.85	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	2.2				7.5		0.1
Delay (s)	35.6	8.4			16.8	2.2				40.5		25.3
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.1			6.1			0.0		38.3		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	17.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	73.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1461	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1461	1504			
Volume (vph)	82	967	0	0	1248	402	645	2	1264	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1049	0	0	1314	423	679	2	1320	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	288	0	76	30	0	0	0
Lane Group Flow (vph)	86	1049	0	0	1314	135	604	629	602	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	555	677			
v/s Ratio Prot	0.05	c0.21			c0.28		0.36	c0.43	c0.44			
v/s Ratio Perm						0.09						
v/c Ratio	0.27	0.44			0.89	0.27	0.95	1.13	0.98			
Uniform Delay, d1	35.3	17.7			32.3	25.3	30.0	31.0	27.0			
Progression Factor	0.71	0.48			0.62	0.29	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.5			6.3	1.0	23.0	80.8	28.8			
Delay (s)	26.9	9.0			23.7	8.3	53.0	111.8	55.8			
Level of Service	C	A			C	A	D	F	E			
Approach Delay (s)		10.4			19.5			74.7			0.0	
Approach LOS		B			B			E			A	

Intersection Summary				
HCM Average Control Delay	40.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1791	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1791	2628
Volume (vph)	315	1601	334	75	643	99	42	3	42	186	45	771
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	315	1601	334	75	643	99	42	3	42	186	45	771
RTOR Reduction (vph)	0	0	145	0	0	18	0	0	39	0	0	194
Lane Group Flow (vph)	315	1601	189	75	643	81	42	3	3	0	231	577
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1393	745	112	956	427	116	117	109		537	1317
v/s Ratio Prot	0.09	c0.47	c0.13	0.04	c0.24		0.01	0.01			0.13	c0.22
v/s Ratio Perm						0.05			0.00			
v/c Ratio	0.46	1.16	0.25	0.67	0.68	0.19	0.19	0.20	0.03		0.43	0.44
Uniform Delay, d1	35.1	29.6	13.4	45.8	35.0	28.1	43.9	43.9	43.4		28.1	16.0
Progression Factor	1.11	0.61	0.37	1.00	1.00	1.00	1.00	1.00	1.00		1.27	1.09
Incremental Delay, d2	1.3	76.3	0.1	11.2	11.5	1.0	0.6	0.6	0.1		2.2	0.9
Delay (s)	40.3	94.3	5.0	57.0	46.0	29.1	44.5	44.5	43.5		37.9	18.2
Level of Service	D	F	A	E	D	C	D	D	D		D	B
Approach Delay (s)		73.5			45.8			44.0			22.8	
Approach LOS		E			D			D			C	

Intersection Summary				
HCM Average Control Delay	54.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.86					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3530			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3530			1863	
Volume (vph)	55	29	221	0	0	0	0	507	9	0	195	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	233	0	0	0	0	534	9	0	205	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	542	0	0	205	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.15			0.11	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.24			0.20	
Uniform Delay, d1	26.8	26.8	21.1					7.4			10.9	
Progression Factor	0.99	0.98	0.90					1.00			0.96	
Incremental Delay, d2	0.3	0.1	0.0					0.2			0.4	
Delay (s)	26.7	26.3	19.0					7.7			10.9	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.0			0.0			7.7			10.9	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.19			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	24.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3336		1770	3483		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3336		1770	3483		1770	1839		1770	1863	1583
Volume (vph)	405	495	306	36	527	63	264	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	521	322	38	555	66	309	286	27	32	306	115
RTOR Reduction (vph)	0	83	0	0	9	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	760	0	38	612	0	309	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	22.1	39.0		5.7	22.6		20.8	20.8		19.5	19.5	19.5
Effective Green, g (s)	21.6	39.5		5.2	23.1		20.3	20.3		19.0	19.0	19.0
Actuated g/C Ratio	0.22	0.40		0.05	0.23		0.20	0.20		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	382	1318		92	805		359	373		338	354	301
v/s Ratio Prot	c0.24	0.23		0.02	c0.18		c0.17	0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.12	0.58		0.41	0.76		0.86	0.83		0.10	0.86	0.07
Uniform Delay, d1	39.2	23.7		45.9	35.9		36.5	36.2		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.02	1.02		0.75	0.80	1.93
Incremental Delay, d2	81.0	1.8		3.0	6.7		18.5	14.4		0.1	17.7	0.1
Delay (s)	120.2	25.5		48.9	42.5		57.6	53.2		25.2	49.1	44.2
Level of Service	F	C		D	D		E	D		C	D	D
Approach Delay (s)		57.3			42.9			55.4			46.2	
Approach LOS		E			D			E			D	

Intersection Summary					
HCM Average Control Delay	52.1	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	83.9%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3387		1770	3517		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3387		1770	3517		1770	3497		1770	3487	
Volume (vph)	103	415	127	105	503	22	125	706	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	392	134	111	529	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	47	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	419	0	111	549	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.1		10.8	20.9		12.5	48.9		7.2	43.6	
Effective Green, g (s)	7.0	18.6		9.8	21.4		11.5	49.4		6.2	44.1	
Actuated g/C Ratio	0.07	0.19		0.10	0.21		0.12	0.49		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	630		173	753		204	1728		110	1538	
v/s Ratio Prot	c0.06	0.12		0.06	c0.16		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.66		0.64	0.73		0.65	0.46		0.47	0.67	
Uniform Delay, d1	46.1	37.8		43.4	36.6		42.3	16.6		45.3	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.7		7.9	3.5		6.9	0.9		3.2	2.4	
Delay (s)	90.2	40.5		51.3	40.1		49.2	17.5		48.5	24.6	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.8			42.0			22.0			25.7	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	32.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	68.3%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3414		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3414		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	295	91	83	410	324	90	375	43	96	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	311	96	87	432	341	95	395	45	101	151	9
RTOR Reduction (vph)	0	25	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	382	0	87	432	129	95	436	0	0	250	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.6	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1127		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.05	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.34		0.67	0.32	0.22	0.21	0.93			0.76	
Uniform Delay, d1	48.1	25.3		45.2	22.1	21.1	29.3	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.8		11.9	0.6	0.8	0.2	25.3			11.1	
Delay (s)	60.4	26.1		57.1	22.8	21.9	29.5	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.1			25.9			56.0			50.1	
Approach LOS		C			C			E			D	

Intersection Summary					
HCM Average Control Delay	37.1	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	64.7%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3453		1770	3539	1583	1770	1883	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3453		1770	3539	1583	1770	1883	1583	1770	1852	
Volume (vph)	28	355	69	57	770	211	136	326	40	176	253	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	73	60	811	222	143	343	42	185	266	11
RTOR Reduction (vph)	0	13	0	0	0	116	0	0	31	0	2	0
Lane Group Flow (vph)	29	434	0	60	811	104	143	343	11	185	275	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.3		7.1	46.9	46.9	12.2	25.6	25.6	8.5	21.9	
Effective Green, g (s)	4.0	44.3		6.6	46.9	46.9	11.7	25.1	25.1	8.0	21.4	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.21	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1530		117	1660	742	207	468	397	142	398	
v/s Ratio Prot	0.02	0.13		c0.03	c0.23		0.08	c0.18		c0.10	0.15	
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.14	0.69	0.73	0.03	1.30	0.70	
Uniform Delay, d1	46.8	17.7		45.1	18.3	15.1	42.4	34.4	28.2	46.0	36.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.02	0.84	
Incremental Delay, d2	2.8	0.5		2.8	1.0	0.4	6.8	5.5	0.0	175.1	4.4	
Delay (s)	49.8	18.2		48.0	19.3	15.5	51.2	39.9	28.3	222.2	35.0	
Level of Service	D	B		D	B	B	D	D	C	F	D	
Approach Delay (s)		20.1			20.1			42.0			110.0	
Approach LOS		C			C			D			F	

Intersection Summary					
HCM Average Control Delay	40.9	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.65				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	65.7%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	628	16	90	1013	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	656	17	95	1066	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			320							
pX, platoon unblocked												
vC, conflicting volume	1092			573			1342	1898	266	1684	1894	546
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1092			573			1342	1898	266	1684	1894	546
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			90			71	77	69	95	95	100
cM capacity (veh/h)	635			998			95	60	710	41	60	482

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	371	202	95	711	381	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	635	1700	1700	998	1700	1700	85	377	59
Volume to Capacity	0.04	0.22	0.12	0.10	0.42	0.22	0.40	0.22	0.11
Queue Length 95th (ft)	3	0	0	8	0	0	40	21	9
Control Delay (s)	10.9	0.0	0.0	9.0	0.0	0.0	73.4	17.3	73.0
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			33.4		73.0
Approach LOS							D		F

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	46.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3462		1770	3506			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3462		1770	3506			1810	1583		1408	
Volume (vph)	3	509	96	122	816	54	244	176	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	536	91	128	859	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	615	0	128	912	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7		8		
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.2		11.0	49.4			25.5	25.5		6.8	
Effective Green, g (s)	0.4	39.2		10.5	49.3			28.0	28.0		6.3	
Actuated g/C Ratio	0.00	0.39		0.10	0.49			0.28	0.28		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1357		186	1728			471	412		117	
v/s Ratio Prot	0.00	c0.18		c0.07	c0.26			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.45		0.69	0.53			0.94	0.16		0.46	
Uniform Delay, d1	49.7	22.5		43.2	17.4			36.3	28.5		43.7	
Progression Factor	1.00	1.00		0.96	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.1		5.1	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.6		47.4	11.0			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.8			15.5			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	28.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3361		1770	3390		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3361		1770	3390		3433	3535		1770	3509	
Volume (vph)	98	863	183	32	574	225	351	961	6	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	382	193	34	604	237	369	1012	6	175	1072	64
RTOR Reduction (vph)	0	62	0	0	37	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	513	0	34	804	0	369	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	31.0		7.2	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	30.0		6.2	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.30		0.06	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	1008		110	956		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.15		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.51		0.31	0.84		0.77	0.82		0.78	0.95	
Uniform Delay, d1	44.9	28.9		44.9	33.8		41.4	29.5		42.4	32.3	
Progression Factor	1.50	1.26		1.13	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.3		0.5	6.0		6.5	6.1		15.3	17.2	
Delay (s)	80.8	37.2		51.3	41.7		47.9	35.8		57.0	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		43.6			42.0			38.9			50.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	43.9	HCM Level of Service		D
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	81.9%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3499			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.85	
Satd. Flow (perm)	1770	3506		1770	3499			3169			2905	
Volume (vph)	50	457	30	111	728	60	10	165	52	70	243	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	481	32	117	766	63	11	174	55	74	256	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	504	0	117	819	0	0	195	0	0	367	0
Turn Type	Prot			Prot					Perm		Perm	
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		166	1882			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.23							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.44			0.35			0.73	
Uniform Delay, d1	23.5	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.83	1.16		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.7	0.4		10.8	0.7			0.4			5.2	
Delay (s)	38.1	9.0		32.8	7.7			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.1			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	14.6	HCM Level of Service		B
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	56.4%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳			↳			↳			↳
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	1.00		0.94			0.95			0.89	
Flt Protected		0.95	1.00		1.00			0.98			0.99	
Satd. Flow (prot)		1770	1854		1738			1728			1642	
Flt Permitted		0.44	1.00		0.98			0.92			0.95	
Satd. Flow (perm)		819	1854		1714			1613			1569	
Volume (vph)	440	58	2	8	83	84	2	1	2	49	4	246
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	463	61	2	8	87	88	2	1	2	52	4	261
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	199	0
Lane Group Flow (vph)	463	62	0	0	120	0	0	3	0	0	118	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.5	20.5			6.5			6.9			6.9	
Effective Green, g (s)	20.5	20.5			6.5			6.9			6.9	
Actuated g/C Ratio	0.55	0.55			0.17			0.24			0.24	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	703	1016			298			384			373	
v/s Ratio Prot	c0.18	0.03										
v/s Ratio Perm					0.07			0.00			c0.08	
v/c Ratio	0.66	0.06			0.40			0.01			0.32	
Uniform Delay, d1	5.9	4.0			13.7			10.9			11.7	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.2	0.0			0.9			0.0			0.5	
Delay (s)	8.1	4.0			14.6			10.9			12.2	
Level of Service	A	A			B			B			B	
Approach Delay (s)		7.8			14.6			10.9			12.2	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↳			↰	↱		↳			↳	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.96	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.98	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	169	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	42	66	178	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4		6			2		
Permitted Phases						4	6				2	
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑			↰↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3489			3468			3509			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3509			3494	
Volume (vph)	77	193	12	112	288	20	0	1217	72	0	1132	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1281	76	0	1192	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1353	0	0	1297	0
Turn Type	Perm			Split								
Protected Phases		3		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.16			0.58			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2045			2037	
v/s Ratio Prot					c0.13			c0.39			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.66			0.64	
Uniform Delay, d1		44.0			41.9			14.9			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.8			1.7			1.5	
Delay (s)		57.6			47.6			16.6			16.1	
Level of Service		E			D			B			B	
Approach Delay (s)		57.6			47.6			16.6			16.1	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱		↰↑			↑↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3538			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3253			5077	
Volume (vph)	0	0	0	85	656	814	12	626	0	0	1178	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	89	691	857	13	659	0	0	1240	13
RTOR Reduction (vph)	0	0	0	0	0	144	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	713	0	672	0	0	1252	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8		2				6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	588		1789			2792	
v/s Ratio Prot					0.22						c0.25	
v/s Ratio Perm						c0.45		0.21				
v/c Ratio					0.58	1.22		0.38			0.45	
Uniform Delay, d1					25.3	31.5		12.8			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	112.7		0.6			0.5	
Delay (s)					25.7	144.2		13.4			14.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			88.6			13.4			14.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	47.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3485						3497		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3485						3497		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	620	54	532	679	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	653	57	560	715	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	703	0	560	715	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1514		638	2391	
v/s Ratio Prot		c0.15						c0.20		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.46		0.88	0.30	
Uniform Delay, d1		25.6						14.1		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.0		12.6	0.0	
Delay (s)		28.2						15.1		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.1			20.3	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↕		↰	↕		↰	↕		↰	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3429		1770	3498		1770	3425		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3429		1770	3498		1770	3425		1770	1863	1583
Volume (vph)	300	794	209	148	903	76	202	511	140	161	387	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	220	156	951	80	213	538	147	169	407	533
RTOR Reduction (vph)	0	21	0	0	6	0	0	22	0	0	0	294
Lane Group Flow (vph)	316	1035	0	156	1025	0	213	663	0	169	407	239
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1222		206	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.12	c0.19		0.09	c0.22	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.66	1.06		0.48	1.09	0.75
Uniform Delay, d1	43.5	32.6		47.1	39.6		41.9	45.0		38.7	44.0	41.4
Progression Factor	1.00	1.00		1.16	0.91		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.4		1.5	25.7		3.6	50.4		0.9	73.3	9.7
Delay (s)	72.8	40.0		57.1	61.8		45.3	95.8		39.6	117.3	51.1
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.8			61.2			83.8			74.0	
Approach LOS		D			E			F			E	

Intersection Summary				
HCM Average Control Delay	64.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↕			↕		↰	↕		↰	↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3457		1770	3483		1770	3459	
Flt Permitted	0.15	1.00			0.57		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	288	3382			1971		1770	3483		1770	3459	
Volume (vph)	202	684	286	108	702	149	279	1252	146	191	1138	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	114	739	157	294	1318	156	201	1198	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	8	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	996	0	294	1466	0	201	1398	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.16	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	5.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	125	1476			860		274	1108		241	1038	
v/s Ratio Prot		0.29					0.17	c0.42		0.11	c0.40	
v/s Ratio Perm	c0.74				0.51							
v/c Ratio	1.70	0.66			1.16		1.07	1.32		0.83	1.35	
Uniform Delay, d1	31.0	24.6			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.09	1.08			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	337.4	0.7			84.3		75.1	151.7		21.3	162.4	
Delay (s)	371.1	27.3			115.3		121.6	189.2		67.6	200.9	
Level of Service	F	C			F		F	F		E	F	
Approach Delay (s)		86.5			115.3			178.0			164.3	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	148.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	122.1%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	177	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	186	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18			20			434	434	20	621	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			434	434	20	621	434	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			100	100	82	100	100	100
cM capacity (veh/h)	1599			1596			481	451	1058	298	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	189	2
Volume Left	1	197	2	1
Volume Right	0	0	186	0
cSH	1599	1596	1036	359
Volume to Capacity	0.00	0.12	0.18	0.01
Queue Length 95th (ft)	0	11	17	0
Control Delay (s)	0.4	7.0	9.2	15.1
Lane LOS	A	A	A	C
Approach Delay (s)	0.4	7.0	9.2	15.1
Approach LOS			A	C

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.88			0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1844		1770	1632			1764		1770	1814	
Flt Permitted	0.19	1.00		0.70	1.00			0.99		0.19	1.00	
Satd. Flow (perm)	348	1844		1303	1632			1747		350	1814	
Volume (vph)	137	79	6	208	106	501	10	415	268	93	521	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	83	6	219	112	627	11	437	282	98	548	116
RTOR Reduction (vph)	0	4	0	0	241	0	0	38	0	0	13	0
Lane Group Flow (vph)	144	85	0	219	398	0	0	892	0	98	651	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	21.9	21.9		21.9	21.9			23.9		31.1	31.1	
Effective Green, g (s)	21.4	21.4		21.4	21.4			23.4		30.6	30.6	
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.39		0.51	0.51	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	124	658		465	582			681		254	925	
v/s Ratio Prot		0.05			0.24					0.02	c0.36	
v/s Ratio Perm	c0.41			0.17				c0.40		0.18		
v/c Ratio	1.16	0.13		0.47	0.68			1.02		0.39	0.70	
Uniform Delay, d1	19.3	13.0		14.9	16.4			18.3		11.1	11.2	
Progression Factor	1.00	1.00		0.90	0.95			1.00		1.00	1.00	
Incremental Delay, d2	130.6	0.4		3.0	5.7			38.7		1.0	2.4	
Delay (s)	149.9	13.4		16.5	21.2			57.0		12.1	13.7	
Level of Service	F	B		B	C			E		B	B	
Approach Delay (s)		97.8			20.0			57.0			13.5	
Approach LOS		F			C			E			B	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1851		1770	1863	1759	
Flt Permitted	1.00		0.42	1.00	0.96	
Satd. Flow (perm)	1851		781	1863	1759	
Volume (vph)	419	21	37	427	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	441	22	39	449	408	45
RTOR Reduction (vph)	2	0	0	0	8	0
Lane Group Flow (vph)	461	0	39	449	445	0
Turn Type			Perm			
Protected Phases	2			6	6	
Permitted Phases			6			
Actuated Green, G (s)	33.9		33.9	33.9	19.1	
Effective Green, g (s)	33.4		33.4	33.4	18.6	
Actuated g/C Ratio	0.56		0.56	0.56	0.31	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1030		435	1037	545	
v/s Ratio Prot	c0.25			0.24	c0.25	
v/s Ratio Perm			0.05			
v/c Ratio	0.45		0.09	0.43	0.82	
Uniform Delay, d1	7.9		6.2	7.8	19.1	
Progression Factor	0.78		1.00	1.00	1.00	
Incremental Delay, d2	1.0		0.4	1.3	9.2	
Delay (s)	7.1		6.6	9.1	28.3	
Level of Service	A		A	A	C	
Approach Delay (s)	7.1			8.9	28.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774			1811		1770	1843		1770	1746	
Flt Permitted		0.77			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1392			1595		1770	1843		1770	1746	
Volume (vph)	204	228	68	38	136	20	163	712	44	19	404	208
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	215	240	72	38	143	21	172	749	46	20	425	219
RTOR Reduction (vph)	0	11	0	0	8	0	0	3	0	0	34	0
Lane Group Flow (vph)	0	516	0	0	194	0	172	792	0	20	810	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			4		5	2		1	6	
Permitted Phases	6			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.8		1.4	19.8	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		405			464		222	675		29	638	
v/s Ratio Prot							c0.10	c0.43		0.01	0.35	
v/s Ratio Perm		c0.37			0.12							
v/c Ratio		1.27			0.42		0.77	0.90		0.69	0.96	
Uniform Delay, d1		19.5			15.7		23.3	13.3		26.9	17.0	
Progression Factor		1.00			1.00		0.91	1.07		0.99	1.12	
Incremental Delay, d2		141.7			0.4		13.4	13.3		40.0	23.0	
Delay (s)		161.2			16.2		34.7	27.5		66.5	42.1	
Level of Service		F			B		C	C		E	D	
Approach Delay (s)		161.2			16.2			28.8			42.8	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	181	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	191	71	5	193	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	81	133	279	199
Volume Left (vph)	4	121	18	5
Volume Right (vph)	62	12	71	1
Hadj (s)	-0.42	0.18	-0.10	0.04
Departure Headway (s)	4.8	5.3	4.6	4.9
Degree Utilization, x	0.11	0.20	0.36	0.27
Capacity (veh/h)	656	613	742	698
Control Delay (s)	8.4	9.6	10.2	9.8
Approach Delay (s)	8.4	9.6	10.2	9.8
Approach LOS	A	A	B	A

Intersection Summary			
Delay	9.7		
HCM Level of Service	A		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	97	42	28	586	591	148
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	44	29	617	622	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.78	0.78	0.78			
vC, conflicting volume	1376	700	778			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1480	617	716			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	1	88	96			
cM capacity (veh/h)	104	384	802			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	146	29	617	778
Volume Left	102	29	0	0
Volume Right	44	0	0	156
cSH	133	692	1700	1700
Volume to Capacity	1.10	0.04	0.36	0.46
Queue Length 95th (ft)	207	3	0	0
Control Delay (s)	173.1	10.4	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	173.1	0.5		0.0
Approach LOS	F			

Intersection Summary				
Average Delay		16.3		
Intersection Capacity Utilization		54.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.98	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1653		1770	3539	1452		3474	
Flt Permitted		0.97	1.00	0.95	0.97		0.27	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1653		510	3539	1452		3241	
Volume (vph)	12	5	95	846	63	53	130	392	219	22	557	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	891	66	56	137	413	231	23	586	71
RTOR Reduction (vph)	0	0	94	0	6	0	0	0	142	0	8	0
Lane Group Flow (vph)	0	18	6	412	384	0	137	413	89	0	672	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split			Perm	Split			Perm			Perm	Perm
Protected Phases	4	4			8	8			2			6
Permitted Phases				4				2		2	6	
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	742		196	1358	557		1243	
v/s Ratio Prot		c0.01		c0.25	0.23			0.12				
v/s Ratio Perm			0.00				c0.27		0.06		0.21	
v/c Ratio		0.17	0.06	0.55	0.52		0.70	0.30	0.16		0.54	
Uniform Delay, d1		49.3	49.0	22.1	21.8		28.6	23.7	22.3		26.4	
Progression Factor		1.00	1.00	0.25	0.23		1.11	0.88	1.42		1.00	
Incremental Delay, d2		0.6	0.2	2.5	2.3		12.7	0.4	0.4		1.7	
Delay (s)		49.8	49.2	8.1	7.3		44.5	21.3	32.0		28.1	
Level of Service		D	D	A	A		D	C	C		C	
Approach Delay (s)		49.3			7.7			28.6			28.1	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay		22.4	HCM Level of Service	C
HCM Volume to Capacity ratio		0.59		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		70.3%	ICU Level of Service	C
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	205	34	474	694	303	268
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	36	499	731	319	303
RTOR Reduction (vph)	0	21	0	0	0	121
Lane Group Flow (vph)	216	15	499	731	319	182
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	18.3	47.1	25.3	84.7	55.9	18.3
Effective Green, g (s)	17.8	46.6	24.8	84.2	55.4	17.8
Actuated g/C Ratio	0.16	0.42	0.23	0.77	0.50	0.16
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	286	671	774	1426	938	256
v/s Ratio Prot	c0.12	0.01	c0.15	c0.39	0.17	0.12
v/s Ratio Perm						
v/c Ratio	0.76	0.02	0.64	0.51	0.34	0.71
Uniform Delay, d1	44.0	18.4	38.6	5.0	16.4	43.7
Progression Factor	0.64	0.16	1.01	0.16	1.00	1.00
Incremental Delay, d2	10.3	0.0	1.5	1.1	1.0	9.0
Delay (s)	38.4	2.9	40.7	1.9	17.3	52.7
Level of Service	D	A	D	A	B	D
Approach Delay (s)	33.3			12.6	34.6	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay		24.5	HCM Level of Service	C
HCM Volume to Capacity ratio		0.56		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		57.3%	ICU Level of Service	B
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1863	1583	1681		1770	3539	1583	1770	1829	
Flt Permitted		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1863	1583	1681		1770	3539	1583	1770	1829	
Volume (vph)	172	370	50	590	14	0	11	729	1468	269	598	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	53	621	15	0	12	767	1545	283	629	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	311	925	0	12	767	1545	283	676	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												16
Turn Type	Split			Perm	Split			Prot		Free	Prot	
Protected Phases	7	7			8	8		5	2		1	6
Permitted Phases				7						Free		
Actuated Green, G (s)	16.2	16.2	16.2	20.8	20.8		1.2	24.2	94.3	17.6	40.6	
Effective Green, g (s)	15.7	15.7	15.7	20.8	20.8		0.7	24.7	94.3	17.1	41.1	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	295	310	264	371	373		13	927	1583	321	797	
v/s Ratio Prot	0.10	c0.21		0.18	0.19		0.01	0.22		0.16	0.37	
v/s Ratio Perm			0.03						c0.98			
v/c Ratio	0.61	1.25	0.17	0.84	0.87		0.92	0.83	0.98	0.88	0.85	
Uniform Delay, d1	36.5	39.3	33.7	35.1	35.5		46.8	32.8	0.0	37.6	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	138.4	0.1	14.9	19.3		205.3	6.0	17.6	22.9	8.2	
Delay (s)	39.1	177.7	33.8	50.0	54.7		252.0	38.8	17.6	60.5	32.0	
Level of Service	D	F	C	D	D		F	D	B	E	C	
Approach Delay (s)		123.7			52.4			25.8			40.4	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay		46.2	HCM Level of Service	D
HCM Volume to Capacity ratio		1.02		
Actuated Cycle Length (s)		94.3	Sum of lost time (s)	4.0
Intersection Capacity Utilization		88.2%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↱				↰↰		↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.0		4.0
Lane Util. Factor		1.00	0.95		0.91	0.91				0.97		1.00
Frpb, ped/bikes		1.00	1.00		0.95	0.97				1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00		1.00
Frt		1.00	0.91		0.91	0.85				1.00		0.85
Flt Protected		0.95	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		1770	3229		2954	1399				3433		1583
Flt Permitted		0.95	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		1770	3229		2954	1399				3433		1583
Volume (vph)	142	429	603	0	569	1966	0	0	0	947	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	2069	0	0	0	997	0	361
RTOR Reduction (vph)	0	224	0	0	212	0	0	0	0	0	0	201
Lane Group Flow (vph)	149	863	0	0	1173	1283	0	0	0	997	0	160
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases		6			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.3			43.3	110.0				34.2		34.2
Effective Green, g (s)	20.0	67.3			43.3	110.0				34.7		34.7
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1976			1163	1399				1083		499
v/s Ratio Prot	0.08	0.27			c0.40					0.29		0.10
v/s Ratio Perm						c0.92						
v/c Ratio	0.46	0.44			1.04dr	0.92				0.92		0.32
Uniform Delay, d1	40.2	11.3			33.4	0.0				36.3		28.7
Progression Factor	1.00	1.00			0.68	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			10.1	1.2				12.5		0.3
Delay (s)	40.6	12.0			32.8	1.2				48.8		29.0
Level of Service	D	B			C	A				D		C
Approach Delay (s)		15.6			17.6			0.0		43.5		
Approach LOS		B			B			A		D		

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	83.8%	ICU Level of Service	E	
Analysis Period (min)	15			

dr: Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑			↑↑↑	↱	↰	↟	↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4639	1348	1681	1511	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4639	1348	1681	1511	659			
Volume (vph)	153	1221	0	0	1932	470	603	226	1164	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1221	0	0	1932	470	603	226	1164	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	277	0	86	10	0	0	0
Lane Group Flow (vph)	153	1221	0	0	1932	193	603	732	582	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	565	508	335			
v/s Ratio Prot	0.09	c0.34			c0.42		0.36	0.48	c0.88			
v/s Ratio Perm						0.14						
v/c Ratio	0.45	0.82			1.15	0.39	1.07	1.44	1.74			
Uniform Delay, d1	39.4	26.3			35.0	26.0	38.5	38.5	27.0			
Progression Factor	1.53	0.39			0.93	1.30	1.00	1.00	1.00			
Incremental Delay, d2	2.7	3.3			68.3	0.9	57.1	209.7	343.6			
Delay (s)	63.2	14.4			100.7	34.8	93.6	246.2	370.6			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		19.8			87.8			237.1			0.0	
Approach LOS		B			F			F			A	

Intersection Summary				
HCM Average Control Delay	123.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑	↱	↰	↑↑	↱	↰	↟	↱	↰	↟	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	0.97	0.91	0.77	1.00	0.95	1.00	0.95	0.95	1.00	1.00		0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.97		1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583	1807		2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.97		1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583	1807		2628
Volume (vph)	469	1191	745	325	1274	283	132	16	66	281	163	888
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	469	1191	745	325	1274	283	132	16	66	281	163	888
RTOR Reduction (vph)	0	0	143	0	0	30	0	0	58	0	0	92
Lane Group Flow (vph)	469	1191	602	325	1274	253	72	76	8	0	424	796
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8		1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	0.14	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.23	0.30
v/s Ratio Perm						0.16			0.01			
v/c Ratio	0.88	1.17	1.07	1.19	1.20	0.53	0.34	0.35	0.04		0.86	0.71
Uniform Delay, d1	45.5	38.5	29.5	46.5	38.5	32.1	43.8	43.8	42.1		38.0	25.9
Progression Factor	1.20	1.02	1.07	1.06	1.09	1.15	1.02	1.02	2.08		1.01	0.75
Incremental Delay, d2	2.2	78.1	33.8	107.5	96.7	3.1	0.7	0.7	0.1		15.4	3.3
Delay (s)	57.0	117.2	65.5	157.6	138.5	40.0	45.5	45.6	87.7		53.9	22.8
Level of Service	E	F	E	F	F	D	D	D	F		D	C
Approach Delay (s)		89.4			127.0			58.5			32.8	
Approach LOS		F			F			E			C	

Intersection Summary				
HCM Average Control Delay	87.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱↱					↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3528			1863	
Volume (vph)	121	159	788	0	0	0	0	1108	25	0	331	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	829	0	0	0	0	1219	26	0	348	0
RTOR Reduction (vph)	0	0	170	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	659	0	0	0	0	1244	0	0	348	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1148	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.24					c0.35			0.19	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.39					0.60			0.57	
Uniform Delay, d1	25.4	25.4	11.5					14.5			30.6	
Progression Factor	1.02	1.20	1.58					1.00			1.31	
Incremental Delay, d2	0.7	0.3	0.1					1.3			3.7	
Delay (s)	31.0	30.8	18.3					15.8			43.7	
Level of Service	C	C	B					B			D	
Approach Delay (s)		21.7			0.0			15.8			43.7	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3359		1770	3480		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3359		1770	3480		1770	1849		1770	1863	1540
Volume (vph)	206	847	294	23	757	59	564	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	892	309	24	797	62	594	633	28	73	314	158
RTOR Reduction (vph)	0	30	0	0	6	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1171	0	24	853	0	594	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.0	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	904		55	728		624	652		357	376	311
v/s Ratio Prot	0.12	c0.35		0.01	c0.25		0.34	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.30		0.44	1.17		0.95	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		34.7	35.6		36.5	42.1	35.8
Progression Factor	1.24	1.04		1.00	1.00		1.08	1.08		1.23	1.18	2.42
Incremental Delay, d2	186.6	139.8		5.5	91.8		22.9	36.4		0.2	13.0	0.1
Delay (s)	248.3	181.4		57.8	135.3		80.4	74.7		45.2	62.8	86.8
Level of Service	F	F		E	F		E	E		D	E	F
Approach Delay (s)		191.8			133.2			67.9			67.4	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM Average Control Delay	124.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3430		1770	3485		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3430		1770	3485		1770	3494		1770	3481	
Volume (vph)	181	733	189	106	530	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	772	199	112	558	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	25	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	946	0	112	612	0	195	1586	0	118	1460	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.4		8.4	22.8		13.1	31.3		8.9	26.1	
Effective Green, g (s)	10.0	25.9		7.4	23.3		12.1	31.8		8.9	26.6	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.35		0.10	0.30	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	987		146	902		238	1235		175	1106	
v/s Ratio Prot	c0.11	c0.28		0.06	0.18		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.96		0.77	0.68		0.82	1.28		0.67	1.31	
Uniform Delay, d1	39.8	31.5		40.5	30.0		37.9	29.1		39.2	30.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.6	19.1		21.1	2.0		19.3	133.8		9.8	146.4	
Delay (s)	94.5	50.7		61.6	32.0		57.2	162.9		49.0	177.1	
Level of Service	F	D		E	C		E	F		D	F	
Approach Delay (s)		67.8			38.5			151.3			167.5	
Approach LOS		E			D			F			F	

Intersection Summary			
HCM Average Control Delay	119.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3389		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3389		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	715	230	158	764	107	266	344	168	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	753	242	166	804	113	280	362	178	273	418	20
RTOR Reduction (vph)	0	31	0	0	0	84	0	18	0	0	1	0
Lane Group Flow (vph)	33	964	0	166	804	29	280	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			1
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.5	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	779		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.28		c0.09	c0.23		0.16	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.24		1.34	0.87	0.07	0.59	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.3	27.8	31.7	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	117.9		196.8	11.0	0.4	1.5	73.9			212.2	
Delay (s)	50.8	156.4		243.3	46.3	28.2	33.2	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		153.0			74.6			84.0			248.7	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	132.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3539	1494	1770	1863	1520	1770	1833	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3455		1770	3539	1494	1770	1863	1520	1770	1833	
Volume (vph)	46	928	137	143	794	280	222	392	133	327	582	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	144	151	836	274	234	413	140	344	613	54
RTOR Reduction (vph)	0	12	0	0	0	169	0	0	99	0	3	0
Lane Group Flow (vph)	48	1109	0	151	836	105	234	413	41	344	664	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.6	29.6	29.6	12.5	29.6	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1088		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.19	c0.36	
v/s Ratio Perm						0.07			0.03			
v/c Ratio	0.56	1.02		0.74	0.62	0.18	1.10	0.76	0.09	1.62	1.25	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.5	44.0	32.4	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.95	
Incremental Delay, d2	6.8	32.3		12.8	2.1	0.7	92.4	6.1	0.1	290.8	119.7	
Delay (s)	53.4	66.6		55.6	27.1	21.2	136.4	38.5	26.0	332.8	153.5	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		66.0			29.3			68.4			214.5	
Approach LOS		E			C			E			F	

Intersection Summary			
HCM Average Control Delay	90.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↓↑			↓	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1312	44	96	1216	13	33	12	96	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1381	46	101	1280	14	35	13	101	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1294			1427			2306	2946	714	2335	2963	647
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1294			1427			2306	2946	714	2335	2963	647
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			79			0	0	72	0	21	98
cM capacity (veh/h)	532			472			0	11	374	0	11	414

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	921	507	101	853	440	41	109	19
Volume Left	23	0	0	101	0	0	35	0	1
Volume Right	0	0	46	0	0	14	0	103	9
cSH	532	1700	1700	472	1700	1700	6	128	0
Volume to Capacity	0.04	0.54	0.30	0.21	0.50	0.26	6.56	0.86	Err
Queue Length 95th (ft)	3	0	0	20	0	0	Err	134	Err
Control Delay (s)	12.1	0.0	0.0	14.7	0.0	0.0	Err	109.6	Err
Lane LOS	B			B			F	F	F
Approach Delay (s)	0.2			1.4			2806.7		Err
Approach LOS							F		F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↓	↱		↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3423		1770	3495			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3423		1770	3495			1814	1555		1814	
Volume (vph)	32	1205	216	158	1050	61	272	237	267	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1268	227	166	1105	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	13	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1482	0	166	1166	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	6.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1095		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.43		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.35		0.78	0.93			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	30.9			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.58			1.00	1.00		1.00	
Incremental Delay, d2	0.6	165.1		1.7	1.7			101.1	0.6		10.7	
Delay (s)	43.6	199.1		52.0	19.9			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		195.7			23.9			100.2			51.4	
Approach LOS		F			C			F			D	

Intersection Summary			
HCM Average Control Delay	108.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰↑	↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3308		1770	3393		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3308		1770	3393		3433	3532		1770	3482	
Volume (vph)	223	862	439	47	608	187	548	1344	15	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	907	462	49	640	197	577	1415	16	298	1511	123
RTOR Reduction (vph)	0	63	0	0	29	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1306	0	49	808	0	577	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.5	29.9		5.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.29		0.05	0.19		0.13	0.36		0.14	0.36	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	956		81	645		448	1286		250	1308	
v/s Ratio Prot	c0.13	c0.39		0.03	0.24		0.17	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.37		0.60	1.25		1.29	1.11		1.19	1.26	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.60	0.91		0.97	0.97		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	165.6		7.6	124.8		148.0	61.8		118.9	117.4	
Delay (s)	30.4	197.9		53.0	163.9		191.5	93.6		161.8	148.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		173.4			157.8			121.8			150.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	148.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	114.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑			↓↑			↓↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3461			3374			3316	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3461			3110			2395	
Volume (vph)	47	997	17	45	877	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1049	18	47	713	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	18	0	0	89	0	0	102	0
Lane Group Flow (vph)	49	1065	0	47	799	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	26.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	26.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.52			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1793			603			465	
v/s Ratio Prot	c0.03	c0.30		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.58		0.58	0.45			0.62			0.82	
Uniform Delay, d1	23.3	6.3		23.4	7.6			18.4			19.3	
Progression Factor	1.03	1.41		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		0.6	0.8			1.9			11.2	
Delay (s)	24.5	11.8		30.0	8.4			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.3			9.5			20.3			30.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↾			↟			↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00	0.98		0.94			0.96			0.90	
Flt Protected		0.95	1.00		0.99			0.99			0.99	
Satd. Flow (prot)		1770	1833		1734			1768			1667	
Flt Permitted		0.28	1.00		0.87			0.90			0.86	
Satd. Flow (perm)		518	1833		1537			1604			1490	
Volume (vph)	567	95	11	66	105	140	19	83	50	167	59	541
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	597	100	12	91	111	147	20	87	53	176	62	569
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	96	0
Lane Group Flow (vph)	597	107	0	0	320	0	0	140	0	0	711	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			731			679	
v/s Ratio Prot	c0.26	0.06										
v/s Ratio Perm	c0.27				0.21			0.09			c0.48	
v/c Ratio	1.16	0.13			1.10			0.19			1.05	
Uniform Delay, d1	21.2	14.2			36.5			14.8			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	92.5	0.1			83.2			0.1			47.6	
Delay (s)	113.7	14.2			119.7			14.7			72.1	
Level of Service	F	B			F			B			E	
Approach Delay (s)		98.0			119.7			14.7			72.1	
Approach LOS		F			F			B			E	

Intersection Summary				
HCM Average Control Delay	84.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	117.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↾	↦			↤	↱		↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00			0.97	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1760			1801	1583		1787			1805	
Flt Permitted	0.95	1.00			0.97	1.00		0.87			0.97	
Satd. Flow (perm)	1770	1760			1801	1583		1208			1747	
Volume (vph)	951	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	154	3	0	748	0	0	574	0
Turn Type	Split			Split			Perm	Perm			Perm	
Protected Phases	3	3		4	4							
Permitted Phases							4	4			2	
Actuated Green, G (s)	17.6	17.6			8.6	8.6		31.6			31.6	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.26	0.26			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary				
HCM Average Control Delay	86.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	110.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↤↦			↤↦			↟↦			↟↦	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	216	36	0	1628	92	0	1817	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1714	97	0	1913	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1807	0	0	2025	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.51			c0.58	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.92			1.03	
Uniform Delay, d1		43.5			42.5			20.8			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			8.2			27.5	
Delay (s)		120.0			47.1			29.0			50.5	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			29.0			50.5	
Approach LOS		F			D			C			D	

Intersection Summary				
HCM Average Control Delay	49.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↤↟	↱		↤↟			↤↟↦	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					0.99	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3521	1583		3532			5077	
Flt Permitted					0.99	1.00		0.72			1.00	
Satd. Flow (perm)					3521	1583		2545			5077	
Volume (vph)	0	0	0	64	581	803	49	1119	0	0	1936	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	691	845	52	1177	0	0	1933	22
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	786	0	1229	0	0	1954	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1555			3103	
v/s Ratio Prot					0.19						0.38	
v/s Ratio Perm						c0.50		c0.48				
v/c Ratio					0.62	1.65		0.79			0.63	
Uniform Delay, d1					27.1	31.5		13.2			11.1	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	304.1		4.2			1.0	
Delay (s)					27.9	335.6		17.3			12.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			200.9			17.3			12.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	74.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#3 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3504		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3504		3433	3539	
Volume (vph)	28	861	78	0	0	0	0	1085	78	927	1009	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	906	82	0	0	0	0	1142	82	976	1062	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1219	0	976	1062	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						38.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.36		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						2.0		2.0	2.0	
Lane Grp Cap (vph)		889						1242		967	2361	
v/s Ratio Prot		c0.29						c0.35		c0.28	0.30	
v/s Ratio Perm												
v/c Ratio		1.14						0.98		1.01	0.45	
Uniform Delay, d1		41.0						35.1		39.5	8.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						21.6		31.2	0.0	
Delay (s)		116.5						56.7		70.7	8.5	
Level of Service		F						E		E	A	
Approach Delay (s)		116.5			0.0			56.7			38.3	
Approach LOS		F			A			E			D	

Intersection Summary				
HCM Average Control Delay	62.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	197	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	214	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					673							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	648	338	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	549	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	80	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	329	531	1068

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	217	12
Volume Left	0	153	0	1
Volume Right	0	1	214	3
cSH	1604	1605	1051	578
Volume to Capacity	0.00	0.10	0.21	0.02
Queue Length 95th (ft)	0	8	19	2
Control Delay (s)	0.0	8.9	9.3	11.4
Lane LOS		A	A	B
Approach Delay (s)	0.0	8.9	9.3	11.4
Approach LOS			A	B

Intersection Summary				
Average Delay	8.1			
Intersection Capacity Utilization	34.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.86			0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1759		1770	1839	
Flt Permitted	0.34	1.00		0.72	1.00			0.93		0.22	1.00	
Satd. Flow (perm)	642	1802		1332	1641			1630		410	1839	
Volume (vph)	132	46	13	225	67	258	13	422	300	90	804	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	50	14	245	73	278	14	459	326	98	874	82
RTOR Reduction (vph)	0	10	0	0	199	0	0	42	0	0	6	0
Lane Group Flow (vph)	143	54	0	245	152	0	0	757	0	98	950	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.1	17.1		17.1	17.1			27.7		34.9	34.9	
Effective Green, g (s)	17.1	17.1		17.1	17.1			27.7		34.9	34.9	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.46		0.58	0.58	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	183	514		380	468			753		311	1070	
v/s Ratio Prot		0.03			0.09					0.02	c0.52	
v/s Ratio Perm	c0.22			0.18				c0.46		0.17		
v/c Ratio	0.78	0.11		0.64	0.33			1.01		0.32	0.89	
Uniform Delay, d1	19.7	15.8		18.8	16.9			16.2		8.7	10.9	
Progression Factor	1.00	1.00		0.77	0.59			1.00		1.00	1.00	
Incremental Delay, d2	27.5	0.4		8.1	1.8			34.1		0.6	9.1	
Delay (s)	47.2	16.2		22.6	11.8			50.3		9.3	20.0	
Level of Service	D	B		C	B			D		A	B	
Approach Delay (s)		37.6			16.3			50.3			19.0	
Approach LOS		D			B			D			B	

Intersection Summary				
HCM Average Control Delay	29.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	95.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Alt#3 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1823		1770	1863	1764	
Flt Permitted	1.00		0.95	1.00	0.96	
Satd. Flow (perm)	1823		1770	1863	1764	
Volume (vph)	155	29	43	169	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	32	47	184	245	17
RTOR Reduction (vph)	8	0	0	0	5	0
Lane Group Flow (vph)	192	0	47	184	257	0
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	31.2		3.4	38.6	13.4	
Effective Green, g (s)	31.2		3.4	38.6	13.4	
Actuated g/C Ratio	0.52		0.06	0.64	0.22	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	948		100	1199	394	
v/s Ratio Prot	c0.11		c0.03	0.10	c0.15	
v/s Ratio Perm						
v/c Ratio	0.20		0.47	0.15	0.65	
Uniform Delay, d1	7.7		27.4	4.2	21.2	
Progression Factor	0.57		1.00	1.00	1.00	
Incremental Delay, d2	0.3		3.5	0.3	3.9	
Delay (s)	4.8		30.9	4.5	25.0	
Level of Service	A		C	A	C	
Approach Delay (s)	4.8			9.8	25.0	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	14.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave — 2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	181	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	197	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	295	133
Volume Left (vph)	0	108	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	0.48	0.11	0.15	0.04
Departure Headway (s)	4.6	5.0	4.3	4.6
Degree Utilization, x	0.02	0.18	0.35	0.17
Capacity (veh/h)	695	662	810	734
Control Delay (s)	7.7	9.1	9.6	8.8
Approach Delay (s)	7.7	9.1	9.6	8.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay		9.2		
HCM Level of Service		A		
Intersection Capacity Utilization		37.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St — 2030 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	130	30	20	647	871	179
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	33	30	703	947	195
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.48	0.48	0.48			
vC, conflicting volume	1805	1044	1141			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2679	1091	1293			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	69	88			
cM capacity (veh/h)	10	126	258			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	180	30	703	1141
Volume Left	141	30	0	0
Volume Right	39	0	0	195
cSH	13	258	1700	1700
Volume to Capacity	13.98	0.12	0.41	0.67
Queue Length 95th (ft)	Err	10	0	0
Control Delay (s)	Err	20.8	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	0.9		0.0
Approach LOS	F			

Intersection Summary				
Average Delay		878.1		
Intersection Capacity Utilization		72.8%	ICU Level of Service	C
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave — 2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1645		1770	3539	1488		3485	
Flt Permitted		0.97	1.00	0.95	0.97		0.17	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1645		311	3539	1488		3240	
Volume (vph)	31	22	136	874	78	72	143	383	379	25	635	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	950	85	78	155	416	412	27	690	68
RTOR Reduction (vph)	0	0	33	0	6	0	0	0	270	0	6	0
Lane Group Flow (vph)	0	58	115	576	531	0	155	416	142	0	779	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split		Perm			Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	38.7	38.7		35.3	35.3	35.3		35.3	
Effective Green, g (s)		24.5	24.5	38.7	38.7		34.8	34.8	34.8		34.8	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.32	0.32	0.32		0.32	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	591	579		98	1120	471		1025	
v/s Ratio Prot		0.03		c0.34	0.32			0.12				
v/s Ratio Perm			c0.07				c0.50		0.10		0.24	
v/c Ratio		0.14	0.33	0.97	0.92		1.58	0.37	0.30		0.76	
Uniform Delay, d1		34.3	35.6	35.2	34.1		37.6	29.1	28.4		33.6	
Progression Factor		1.00	1.00	0.57	0.56		0.58	0.58	0.34		1.00	
Incremental Delay, d2		0.7	2.5	27.8	17.3		290.5	0.6	1.1		5.3	
Delay (s)		35.1	38.3	48.0	36.5		312.4	17.4	10.8		39.1	
Level of Service		D	D	D	D		F	B	B		D	
Approach Delay (s)		37.4			42.5			61.2			39.1	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay		47.2	HCM Level of Service	D
HCM Volume to Capacity ratio		1.03		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		88.1%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St — 2030 Plus Alt#3 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	343	67	691	927	412	348
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	373	73	751	1008	448	378
RTOR Reduction (vph)	0	35	0	0	0	20
Lane Group Flow (vph)	373	38	751	1008	448	358
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	26.1	67.9	26.3	76.9	45.1	74.7
Effective Green, g (s)	25.6	57.4	27.8	76.4	44.6	74.2
Actuated g/C Ratio	0.23	0.52	0.25	0.69	0.41	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	412	826	868	1294	755	1068
v/s Ratio Prot	c0.21	0.02	c0.22	c0.54	0.24	0.23
v/s Ratio Perm						
v/c Ratio	0.91	0.05	0.87	0.78	0.59	0.34
Uniform Delay, d1	41.0	12.9	39.3	11.2	25.6	7.5
Progression Factor	0.81	0.51	0.56	1.00	1.00	1.00
Incremental Delay, d2	20.2	0.0	4.4	2.2	3.4	0.2
Delay (s)	45.3	6.6	26.5	23.2	29.0	7.7
Level of Service	D	A	C	C	C	A
Approach Delay (s)	39.0		24.6	19.3		
Approach LOS	D		C	B		

Intersection Summary				
HCM Average Control Delay		25.3	HCM Level of Service	C
HCM Volume to Capacity ratio		0.82		
Actuated Cycle Length (s)		110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		74.5%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Volume (vph)	26	21	7	853	19	16	41	340	1318	135	485	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	905	14	17	45	370	1433	147	527	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	475	460	0	45	370	1433	147	559	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	661	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.10		0.08	0.30	
v/s Ratio Perm			0.00						c0.91			
v/c Ratio	0.38	0.30	0.01	0.83	0.81		0.53	0.35	0.91	0.75	0.85	
Uniform Delay, d1	35.2	35.1	34.7	22.9	22.6		36.1	20.8	0.0	32.6	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	9.9	7.9		2.7	0.1	9.0	13.6	9.6	
Delay (s)	36.4	35.9	34.7	32.8	30.5		37.8	21.0	9.0	46.2	31.8	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			31.7			12.1			34.0	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	72.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			2988	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			2988	1399				3433		1583
Volume (vph)	115	309	31	0	418	1595	0	0	0	1078	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1734	0	0	0	1172	0	282
RTOR Reduction (vph)	0	6	0	0	147	0	0	0	0	0	0	150
Lane Group Flow (vph)	125	364	0	0	803	1236	0	0	0	1172	0	132
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	59.5			44.1	110.0				42.0		42.0
Effective Green, g (s)	11.4	59.5			44.1	110.0				42.5		42.5
Actuated g/C Ratio	0.10	0.54			0.40	1.00				0.39		0.39
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1888			1198	1399				1326		612
v/s Ratio Prot	0.07	0.10			0.27							0.08
v/s Ratio Perm						c0.88				0.34		
v/c Ratio	0.68	0.19			0.67	0.88				0.88		0.22
Uniform Delay, d1	47.8	12.9			27.0	0.0				31.5		22.8
Progression Factor	1.00	1.00			0.97	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.9				7.3		0.1
Delay (s)	55.7	13.2			27.1	2.9				38.7		22.7
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.9			13.4			0.0			35.6	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.69			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.69			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	123	1263	0	0	1585	487	427	21	1401	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1373	0	0	1724	529	464	23	1523	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	340	0	161	2	0	0	0
Lane Group Flow (vph)	134	1373	0	0	1724	189	464	623	760	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.39			0.37		0.28	0.43	c1.15			
v/s Ratio Perm						0.13						
v/c Ratio	0.77	1.15			1.04	0.36	0.63	0.99	1.95			
Uniform Delay, d1	48.4	38.5			35.4	26.2	24.1	30.7	22.5			
Progression Factor	1.20	0.62			0.98	1.31	1.00	1.00	1.00			
Incremental Delay, d2	14.0	74.4			28.2	1.0	4.1	32.4	438.9			
Delay (s)	72.2	98.9			63.0	35.2	28.2	63.1	461.4			
Level of Service	E	F			E	D	C	E	F			
Approach Delay (s)		94.7			56.5			206.0			0.0	
Approach LOS		F			E			F			A	

Intersection Summary				
HCM Average Control Delay	118.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.65			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	88.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1815	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1815	2628
Volume (vph)	495	946	1230	350	751	295	227	62	101	297	270	1090
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	538	1028	1337	380	816	321	247	67	110	323	293	1185
RTOR Reduction (vph)	0	50	85	0	0	76	0	0	96	0	0	27
Lane Group Flow (vph)	538	1488	742	380	816	243	153	161	12	0	616	1158
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		8	8		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.16	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.34	0.44
v/s Ratio Perm						0.16			0.01			
v/c Ratio	0.91	1.48	1.42	1.39	0.77	0.53	0.84	0.86	0.07		1.24	0.91
Uniform Delay, d1	44.6	37.5	31.5	46.5	35.0	32.1	48.0	48.2	44.0		40.0	26.4
Progression Factor	1.21	1.03	1.05	1.00	1.00	1.00	1.28	1.28	2.47		0.92	0.77
Incremental Delay, d2	2.5	214.9	191.6	195.1	5.3	4.4	23.7	26.6	0.1		119.2	7.0
Delay (s)	56.6	253.3	224.8	241.6	40.4	36.4	84.3	87.3	108.7		156.2	27.2
Level of Service	E	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		208.8			89.9			91.6			71.3	
Approach LOS		F			F			F			E	

Intersection Summary				
HCM Average Control Delay	136.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.38			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	113.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.85			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1598	24	0	473	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1737	26	0	514	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1759	0	0	514	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.50			0.28	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.94			0.60	
Uniform Delay, d1	21.7	21.7	25.2					24.5			22.2	
Progression Factor	1.04	1.04	1.10					0.55			0.58	
Incremental Delay, d2	0.7	0.3	3.5					6.2			2.7	
Delay (s)	23.1	23.0	31.2					21.7			15.9	
Level of Service	C	C	C					C			B	
Approach Delay (s)		29.0			0.0			21.7			15.9	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3334		1770	3508		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3334		1770	3508		1770	1839		1770	1863	1549
Volume (vph)	101	694	384	40	755	38	330	266	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	754	417	43	821	41	359	313	24	40	308	107
RTOR Reduction (vph)	0	103	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1068	0	43	857	0	359	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.5		2.3	17.8		15.2	15.2		14.2	14.2	14.2
Effective Green, g (s)	4.0	19.5		2.3	17.8		15.2	15.2		14.2	14.2	14.2
Actuated g/C Ratio	0.06	0.29		0.03	0.26		0.23	0.23		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	105	967		61	929		400	416		374	394	327
v/s Ratio Prot	c0.06	c0.32		0.02	0.24		c0.20	0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.05	1.10		0.70	0.92		0.90	0.80		0.11	0.78	0.07
Uniform Delay, d1	31.6	23.8		32.1	24.0		25.2	24.6		21.4	25.0	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	101.2	62.0		30.9	14.3		22.0	10.6		0.1	9.7	0.1
Delay (s)	132.8	85.8		63.0	38.3		47.2	35.1		21.5	34.7	21.3
Level of Service	F	F		E	D		D	D		C	C	C
Approach Delay (s)		89.9			39.5			41.4			30.4	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM Average Control Delay	56.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3422		1770	3521			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3422		1770	3521			1809	1555		1785	
Volume (vph)	19	1250	226	175	1344	32	258	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1359	246	190	1461	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1592	0	190	1495	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1228		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.47		0.11	c0.42			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.30		0.97	0.93			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	25.4			37.8	31.0		39.8	
Progression Factor	0.94	0.73		0.81	0.69			1.00	1.00		1.00	
Incremental Delay, d2	238.0	139.4		12.7	1.2			59.1	0.4		0.6	
Delay (s)	284.4	162.7		48.7	18.8			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		164.3			22.2			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	88.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2030 Plus Alt#3 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.98	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3077		1770	3387		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3077		1770	3387		3433	3516		1770	3354	
Volume (vph)	192	788	484	72	681	109	835	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	857	526	78	740	118	690	1205	27	170	1276	228
RTOR Reduction (vph)	0	92	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1291	0	78	845	0	690	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.5	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	994		83	806		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.42		0.04	0.26		c0.20	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.30		0.94	1.05		1.26	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.8		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.56	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	135.1		77.0	45.1		129.9	25.6		18.3	209.1	
Delay (s)	62.1	144.4		124.5	83.2		171.9	58.1		61.1	234.8	
Level of Service	E	F		F	F		F	E		E	F	
Approach Delay (s)		133.8			86.7			98.9			217.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	136.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.33			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	115.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

SYNCHRO LOS SHEETS
ALTERNATIVE #4
BASE YEAR

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3387		1770	3522		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3387		1770	3522		1770	3436		1770	1863	1583
Volume (vph)	500	775	313	102	616	20	91	176	42	59	193	186
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	543	842	340	111	670	22	99	191	46	64	210	202
RTOR Reduction (vph)	0	34	0	0	2	0	0	20	0	0	0	172
Lane Group Flow (vph)	543	1148	0	111	690	0	99	217	0	64	210	30
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.8	54.3		10.8	30.5		11.6	11.6		16.3	16.3	16.3
Effective Green, g (s)	34.8	55.3		10.8	31.5		11.6	11.6		16.3	16.3	16.3
Actuated g/C Ratio	0.31	0.50		0.10	0.29		0.11	0.11		0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1703		174	1009		187	362		262	276	235
v/s Ratio Prot	c0.31	c0.34		0.06	0.20		0.06	c0.06		0.04	c0.11	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.67		0.64	0.68		0.53	0.60		0.24	0.76	0.13
Uniform Delay, d1	37.3	20.6		47.7	34.8		46.6	47.0		41.4	45.0	40.7
Progression Factor	1.00	1.00		0.79	1.38		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.5	2.2		5.6	2.8		2.1	2.4		0.5	11.7	0.2
Delay (s)	68.8	22.7		43.4	51.0		48.7	49.3		41.9	56.7	40.9
Level of Service	E	C		D	D		D	D		D	E	D
Approach Delay (s)		37.2			49.9			49.1			48.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	43.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3456			3443		1770	3495		1770	3470	
Flt Permitted	0.21	1.00			0.62		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	390	3456			2158		1770	3495		1770	3470	
Volume (vph)	70	670	121	70	521	103	130	507	46	113	660	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	728	132	76	566	112	141	551	50	123	717	108
RTOR Reduction (vph)	0	16	0	0	15	0	0	5	0	0	9	0
Lane Group Flow (vph)	76	844	0	0	739	0	141	596	0	123	816	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	38.2	38.2			38.2		13.2	42.6		16.0	45.6	
Effective Green, g (s)	38.2	38.2			38.2		13.2	43.8		16.0	46.6	
Actuated g/C Ratio	0.35	0.35			0.35		0.12	0.40		0.15	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	135	1201			749		212	1392		257	1470	
v/s Ratio Prot		0.24					c0.08	0.17		0.07	c0.24	
v/s Ratio Perm	0.19				c0.34							
v/c Ratio	0.56	0.70			0.99		0.67	0.43		0.48	0.55	
Uniform Delay, d1	29.1	31.0			35.6		46.3	24.0		43.2	23.9	
Progression Factor	0.44	0.51			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	1.5			29.3		7.6	1.0		1.4	1.5	
Delay (s)	16.8	17.4			64.9		53.9	25.0		44.6	25.4	
Level of Service	B	B			E		D	C		D	C	
Approach Delay (s)		17.3			64.9			30.6			27.9	
Approach LOS		B			E			C			C	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	77	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	3	2	84	60	1	2	0	84	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	61				5			233	233	4	316	233	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	61				5			233	233	4	316	233	60
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100				95			100	100	92	100	100	100
cM capacity (veh/h)	1542				1616			693	633	1079	564	633	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	145	86	1
Volume Left	0	84	2	0
Volume Right	2	61	84	0
cSH	1542	1616	1064	633
Volume to Capacity	0.00	0.05	0.08	0.00
Queue Length 95th (ft)	0	4	7	0
Control Delay (s)	0.0	4.4	8.7	10.7
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.7
Approach LOS			A	B

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	57	46	5	136	47	36	11	108	61	105	305	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	50	5	148	51	39	12	117	88	114	332	98
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2					
Volume Total (vph)	62	55	148	90	217	114	429					
Volume Left (vph)	62	0	148	0	12	114	0					
Volume Right (vph)	0	5	0	39	88	0	98					
Hadj (s)	0.53	-0.03	0.53	-0.27	-0.20	0.53	-0.13					
Departure Headway (s)	7.7	7.1	7.4	6.6	6.2	6.6	5.9					
Degree Utilization, x	0.13	0.11	0.30	0.16	0.38	0.21	0.70					
Capacity (veh/h)	426	458	454	506	550	530	590					
Control Delay (s)	10.6	9.7	12.4	9.7	12.9	10.1	20.4					
Approach Delay (s)	10.2		11.4		12.9	18.2						
Approach LOS	B		B		B	C						

Intersection Summary				
Delay	14.9			
HCM Level of Service	B			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EB1	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	232	0	0	219	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	252	0	0	238	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			252		490	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			252		490	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1313		537	786

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	252	238	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1313	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	15.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			1.00		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1718			1829		1770	1850		1770	1816	
Flt Permitted		0.93			0.80		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1608			1492		1770	1850		1770	1816	
Volume (vph)	52	75	132	37	86	4	38	221	13	23	385	76
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	82	143	40	93	4	39	295	14	25	418	83
RTOR Reduction (vph)	0	74	0	0	2	0	0	3	0	0	12	0
Lane Group Flow (vph)	0	208	0	0	135	0	39	306	0	25	489	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.0	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		322			298		85	1003		32	930	
v/s Ratio Prot							c0.02	0.17		0.01	c0.27	
v/s Ratio Perm		c0.13			0.09							
v/c Ratio		0.64			0.45		0.46	0.31		0.78	0.53	
Uniform Delay, d1		18.4			17.6		23.2	6.3		24.5	8.1	
Progression Factor		1.00			1.00		0.90	1.20		1.00	1.00	
Incremental Delay, d2		3.9			0.8		2.8	0.8		72.6	2.1	
Delay (s)		22.3			18.4		23.6	8.4		97.1	10.3	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		22.3			18.4			10.1			14.4	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.4	HCM Level of Service		B
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	67	12	4	22	76	33	0	78	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	7	73	13	4	24	83	36	0	85	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	11	90	142	90								
Volume Left (vph)	2	73	24	0								
Volume Right (vph)	7	4	36	5								
Hadj (s)	0.29	0.17	-0.08	0.00								
Departure Headway (s)	4.2	4.6	4.2	4.3								
Degree Utilization, x	0.01	0.12	0.16	0.11								
Capacity (veh/h)	795	737	837	812								
Control Delay (s)	7.3	8.2	8.0	7.8								
Approach Delay (s)	7.3	8.2	8.0	7.8								
Approach LOS	A	A	A	A								

Intersection Summary				
Delay	8.0			
HCM Level of Service	A			
Intersection Capacity Utilization	31.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	37	22	29	179	352	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	24	32	195	383	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	891	434	485			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	891	434	485			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	96	97			
cM capacity (veh/h)	398	622	1076			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	64	32	195	485
Volume Left	40	32	0	0
Volume Right	24	0	0	102
cSH	460	1076	1700	1700
Volume to Capacity	0.14	0.03	0.11	0.29
Queue Length 95th (ft)	12	2	0	0
Control Delay (s)	14.1	8.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.1	1.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3415		3539	1583		3531
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3415		3539	1583		3279
Volume (vph)	371	30	406	391	17	329
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	403	33	441	425	18	358
RTOR Reduction (vph)	6	0	0	230	0	0
Lane Group Flow (vph)	430	0	441	196	0	376
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	46.5		46.5	46.5		46.5
Effective Green, g (s)	46.0		46.0	46.0		46.0
Actuated g/C Ratio	0.46		0.46	0.46		0.46
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1571		1628	728		1508
v/s Ratio Prot	c0.13		c0.12			
v/s Ratio Perm				0.12		0.11
v/c Ratio	0.27		0.27	0.27		0.25
Uniform Delay, d1	16.7		16.7	16.6		16.5
Progression Factor	0.69		0.14	2.82		1.00
Incremental Delay, d2	0.4		0.1	0.3		0.4
Delay (s)	12.0		2.4	47.2		16.9
Level of Service	B		A	D		B
Approach Delay (s)	12.0		24.4			16.9
Approach LOS	B		C			B

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	348	16	223	214	61	226
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	378	16	242	233	88	246
RTOR Reduction (vph)	0	10	0	0	0	194
Lane Group Flow (vph)	378	6	242	233	88	52
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 6	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	21.5	38.1	13.1	71.5	54.9	21.5
Effective Green, g (s)	21.0	37.6	12.6	71.0	54.4	21.0
Actuated g/C Ratio	0.21	0.38	0.13	0.71	0.54	0.21
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	595	433	1323	1013	332
v/s Ratio Prot	c0.21	0.00	c0.07	c0.13	0.05	0.03
v/s Ratio Perm						
v/c Ratio	1.02	0.01	0.56	0.18	0.09	0.16
Uniform Delay, d1	39.5	19.5	41.1	4.8	10.9	32.3
Progression Factor	1.10	2.66	0.82	0.27	1.00	1.00
Incremental Delay, d2	48.8	0.0	1.5	0.3	0.2	0.2
Delay (s)	92.1	52.0	27.0	1.6	11.1	32.5
Level of Service	F	D	C	A	B	C
Approach Delay (s)	80.5			14.5	26.8	
Approach LOS	F			B	C	

Intersection Summary			
HCM Average Control Delay	42.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1797	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1702		1770	3539	1583	1770	1797	
Volume (vph)	5	21	16	671	79	0	88	39	734	60	231	71
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	23	17	729	86	0	96	42	798	65	251	77
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	5	23	1	397	418	0	96	42	798	65	316	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	2.8	2.8	2.8	23.3	23.3		4.7	16.6	62.2	4.0	15.9	
Effective Green, g (s)	2.3	2.3	2.3	23.3	23.3		4.2	17.1	62.2	3.5	16.4	
Actuated g/C Ratio	0.04	0.04	0.04	0.37	0.37		0.07	0.27	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	65	69	59	630	638		120	973	1583	100	474	
v/s Ratio Prot	0.00	0.01		0.24	c0.25		0.05	0.01		0.04	c0.16	
v/s Ratio Perm			0.00						c0.50			
v/c Ratio	0.08	0.33	0.01	0.63	0.66		0.80	0.04	0.50	0.65	0.67	
Uniform Delay, d1	28.9	29.2	28.9	15.9	16.1		28.6	16.5	0.0	28.8	20.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	1.8	2.2		29.0	0.0	1.1	10.9	3.2	
Delay (s)	29.1	30.2	28.9	17.7	18.3		57.6	16.5	1.1	39.7	23.7	
Level of Service	C	C	C	B	B		E	B	A	D	C	
Approach Delay (s)		29.6			18.0			7.6			26.3	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3292			3390	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3292			3390	1441				3433		1583
Volume (vph)	119	217	189	0	680	853	0	0	0	776	0	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	236	205	0	739	927	0	0	0	843	0	139
RTOR Reduction (vph)	0	75	0	0	0	0	0	0	0	0	0	99
Lane Group Flow (vph)	129	366	0	0	739	927	0	0	0	843	0	40
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	63.2			40.2	100.0				28.3		28.3
Effective Green, g (s)	19.0	63.2			40.2	100.0				28.8		28.8
Actuated g/C Ratio	0.19	0.63			0.40	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	2081			1353	1441				989		456
v/s Ratio Prot	0.07	0.11			0.22					c0.25		
v/s Ratio Perm						c0.64						0.03
v/c Ratio	0.38	0.18			0.54	0.64				0.85		0.09
Uniform Delay, d1	35.4	7.6			22.9	0.0				33.6		26.0
Progression Factor	1.00	1.00			0.77	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	1.3				7.1		0.1
Delay (s)	35.7	7.8			18.5	1.3				40.7		26.1
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.1			8.9			0.0		38.6		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	18.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1457	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1457	1504			
Volume (vph)	74	919	0	0	944	296	589	2	1193	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	999	0	0	1026	322	640	2	1297	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	219	0	81	35	0	0	0
Lane Group Flow (vph)	80	999	0	0	1026	103	582	604	637	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6	4					
Actuated Green, G (s)	18.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	18.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.18	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	0.5	3.5				
Lane Grp Cap (vph)	318	2390			1484	507	639	554	677			
v/s Ratio Prot	0.05	c0.20			c0.22		0.35	c0.41	c0.42			
v/s Ratio Perm						0.07						
v/c Ratio	0.25	0.42			0.69	0.20	0.91	1.09	0.94			
Uniform Delay, d1	35.2	17.5			29.7	24.7	29.4	31.0	26.2			
Progression Factor	0.66	0.49			0.60	0.38	1.00	1.00	1.00			
Incremental Delay, d2	1.6	0.5			2.3	0.8	17.5	65.3	21.4			
Delay (s)	24.8	9.1			20.0	10.2	46.9	96.3	47.6			
Level of Service	C	A			B	B	D	F	D			
Approach Delay (s)		10.3			17.6			64.6			0.0	
Approach LOS		B			B			E			A	

Intersection Summary				
HCM Average Control Delay	36.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1798	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1798	2628
Volume (vph)	680	1105	319	45	595	167	42	3	42	114	45	616
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	748	1201	347	49	647	182	46	3	46	124	49	670
RTOR Reduction (vph)	0	0	168	0	0	42	0	0	43	0	0	199
Lane Group Flow (vph)	748	1201	179	49	647	140	24	25	3	0	173	471
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.9	41.6	52.2	6.8	26.5	26.5	7.1	7.1	7.1		30.6	51.4
Effective Green, g (s)	20.4	41.1	51.7	6.3	27.0	27.0	6.6	6.6	6.6		30.0	50.4
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	700	1393	745	112	956	427	111	112	104		539	1325
v/s Ratio Prot	c0.22	c0.35	c0.12	0.03	c0.18		0.01	0.01			0.10	c0.18
v/s Ratio Perm						0.09			0.00			
v/c Ratio	1.07	0.86	0.24	0.44	0.68	0.33	0.22	0.22	0.03		0.32	0.36
Uniform Delay, d1	39.8	26.9	13.3	45.1	32.6	29.2	44.2	44.3	43.7		27.1	15.0
Progression Factor	1.13	0.59	0.40	0.74	0.69	0.61	1.00	1.00	1.00		1.06	1.91
Incremental Delay, d2	47.5	4.8	0.1	0.8	3.2	1.7	0.7	0.7	0.1		1.5	0.7
Delay (s)	92.3	20.7	5.4	34.5	25.8	19.6	45.0	45.0	43.8		30.3	29.4
Level of Service	F	C	A	C	C	B	D	D	D		C	C
Approach Delay (s)		41.7			24.9			44.4			29.6	
Approach LOS		D			C			D			C	

Intersection Summary				
HCM Average Control Delay	35.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1810	3327	2787	1770		1583		3527			1863	
Flt Permitted	0.95	0.98	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1810	3327	2787	1770		1583		3527			1863	
Volume (vph)	35	20	200	6	0	20	0	399	9	0	101	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	20	217	7	0	22	0	434	10	0	110	0
RTOR Reduction (vph)	0	0	116	0	0	21	0	2	0	0	0	0
Lane Group Flow (vph)	21	45	101	7	0	1	0	442	0	0	110	0
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	5	3				2			6	
Permitted Phases			4			3						
Actuated Green, G (s)	42.7	42.7	47.7	3.7		3.7		43.1			34.6	
Effective Green, g (s)	42.2	42.2	46.7	3.2		3.2		42.6			34.1	
Actuated g/C Ratio	0.42	0.42	0.47	0.03		0.03		0.43			0.34	
Clearance Time (s)	3.5	3.5	3.5	3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	679	1404	1413	57		51		1503			635	
v/s Ratio Prot	0.01	0.01	c0.00	c0.00				c0.13			0.06	
v/s Ratio Perm			0.03			0.00						
v/c Ratio	0.03	0.03	0.07	0.12		0.01		0.29			0.17	
Uniform Delay, d1	16.9	16.9	14.7	47.0		46.9		18.8			23.1	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00			1.59	
Incremental Delay, d2	0.1	0.0	0.0	0.7		0.1		0.5			0.6	
Delay (s)	17.0	17.0	14.7	47.7		47.0		19.3			37.2	
Level of Service	B	B	B	D		D		B			D	
Approach Delay (s)		15.2			47.1			19.3			37.2	
Approach LOS		B			D			B			D	

Intersection Summary				
HCM Average Control Delay	21.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.18			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	28.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3326		1770	3473		1770	1827		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3326		1770	3473		1770	1827		1770	1863	1583
Volume (vph)	355	359	241	34	422	60	270	173	26	26	141	93
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	390	262	37	459	65	293	188	28	28	153	101
RTOR Reduction (vph)	0	92	0	0	11	0	0	6	0	0	0	88
Lane Group Flow (vph)	386	560	0	37	513	0	293	210	0	28	153	13
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	28.3	45.1		5.7	22.5		20.7	20.7		13.5	13.5	13.5
Effective Green, g (s)	27.8	45.6		5.2	23.0		20.2	20.2		13.0	13.0	13.0
Actuated g/C Ratio	0.28	0.46		0.05	0.23		0.20	0.20		0.13	0.13	0.13
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	492	1517		92	799		358	389		230	242	206
v/s Ratio Prot	c0.22	0.17		0.02	c0.15		c0.17	0.12		0.02	c0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.78	0.37		0.40	0.64		0.82	0.57		0.12	0.63	0.06
Uniform Delay, d1	33.3	17.8		45.9	34.8		38.1	36.0		38.5	41.2	38.2
Progression Factor	0.63	0.77		1.00	1.00		0.98	0.97		0.86	0.80	1.15
Incremental Delay, d2	5.0	0.4		2.9	3.9		13.5	2.1		0.2	5.2	0.1
Delay (s)	26.0	14.2		48.8	38.7		50.7	37.0		33.3	42.2	43.8
Level of Service	C	B		D	D		D	D		C	D	D
Approach Delay (s)		18.6			39.4			44.9			41.0	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3370		1770	3511		1770	3479		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3370		1770	3511		1770	3479		1770	3498	
Volume (vph)	68	190	89	99	400	22	103	447	57	49	595	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	207	97	97	435	24	112	486	62	53	647	55
RTOR Reduction (vph)	0	63	0	0	5	0	0	7	0	0	4	0
Lane Group Flow (vph)	74	241	0	97	454	0	112	641	0	53	698	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	14.9		9.0	17.5		11.4	53.9		7.2	49.7	
Effective Green, g (s)	5.4	15.4		8.0	18.0		10.4	54.4		6.2	50.2	
Actuated g/C Ratio	0.05	0.15		0.08	0.18		0.10	0.54		0.06	0.50	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	519		142	632		184	1893		110	1758	
v/s Ratio Prot	0.04	0.07		c0.05	c0.13		c0.06	0.18		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.77	0.47		0.68	0.72		0.61	0.29		0.48	0.40	
Uniform Delay, d1	46.7	38.5		44.8	38.6		42.9	12.3		45.3	15.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	0.7		12.7	3.9		5.6	0.4		3.3	0.7	
Delay (s)	77.6	39.2		57.5	42.5		48.5	12.7		48.6	16.2	
Level of Service	E	D		E	D		D	B		D	B	
Approach Delay (s)		46.7			45.1			18.8			18.4	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.95			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	1761			1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3417		1770	3539	1583	1770	1761			1790	
Volume (vph)	24	169	51	43	307	61	90	63	30	3	23	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	184	55	47	334	66	98	68	33	3	25	10
RTOR Reduction (vph)	0	16	0	0	0	28	0	25	0	0	9	0
Lane Group Flow (vph)	26	223	0	47	334	38	98	68	0	0	29	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	55.6		5.4	57.8	57.8	11.1	11.1			13.4	
Effective Green, g (s)	2.7	55.6		4.9	57.8	57.8	10.6	10.6			12.9	
Actuated g/C Ratio	0.03	0.56		0.05	0.58	0.58	0.11	0.11			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1900		87	2048	915	188	187			231	
v/s Ratio Prot	0.01	0.07		c0.03	c0.09		c0.06	0.04			c0.02	
v/s Ratio Perm						0.02						
v/c Ratio	0.54	0.12		0.54	0.16	0.04	0.52	0.35			0.13	
Uniform Delay, d1	48.0	10.5		46.4	9.8	9.1	42.3	41.5			38.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	0.1		5.3	0.2	0.1	2.0	0.8			0.2	
Delay (s)	57.5	10.7		51.8	10.0	9.2	44.3	42.4			38.7	
Level of Service	E	B		D	B	A	D	D			D	
Approach Delay (s)		15.3			14.8			43.4			38.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3425		1770	3539	1583	1770	1863	1583	1770	1842	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3425		1770	3539	1583	1770	1863	1583	1770	1842	
Volume (vph)	28	152	41	51	372	202	129	230	39	74	127	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	165	45	55	404	220	140	250	42	80	138	11
RTOR Reduction (vph)	0	19	0	0	0	110	0	0	34	0	3	0
Lane Group Flow (vph)	30	191	0	55	404	110	140	250	8	80	146	0
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		
Protected Phases	1	6		5	2		3	8	4	7	4	
Permitted Phases						2			4			
Actuated Green, G (s)	4.6	47.6		7.0	49.9	49.9	12.1	23.2	18.9	7.8	18.9	
Effective Green, g (s)	4.1	47.5		6.5	49.9	49.9	11.6	22.7	18.4	7.3	18.4	
Actuated g/C Ratio	0.04	0.48		0.06	0.50	0.50	0.12	0.23	0.18	0.07	0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	73	1627		115	1766	790	205	423	291	129	339	
v/s Ratio Prot	0.02	0.06		c0.03	c0.11		c0.08	c0.13		0.05	0.08	
v/s Ratio Perm						0.07			0.00			
v/c Ratio	0.41	0.12		0.48	0.23	0.14	0.68	0.59	0.03	0.62	0.43	
Uniform Delay, d1	46.8	14.6		45.1	14.2	13.5	42.4	34.5	33.5	45.0	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	
Incremental Delay, d2	2.7	0.1		2.3	0.3	0.4	8.3	1.9	0.0	7.7	0.6	
Delay (s)	49.5	14.7		47.4	14.5	13.9	50.7	36.4	33.5	52.7	33.6	
Level of Service	D	B		D	B	B	D	D	C	E	C	
Approach Delay (s)		19.1			16.9			40.7			41.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1020: 40th St & Harlan St — Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	223	16	90	599	21	26	13	74	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	242	17	98	651	23	28	14	80	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			320							
pX, platoon unblocked												
vC, conflicting volume	674			260			827	1173	130	1119	1170	337
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	674			260			827	1173	130	1119	1170	337
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			88	92	91	98	98	100
cM capacity (veh/h)	913			1302			239	171	896	127	172	659

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	162	98	98	434	240	35	88	7
Volume Left	26	0	0	98	0	0	28	0	2
Volume Right	0	0	17	0	0	23	0	80	1
cSH	913	1700	1700	1302	1700	1700	222	668	173
Volume to Capacity	0.03	0.10	0.06	0.08	0.26	0.14	0.16	0.13	0.04
Queue Length 95th (ft)	2	0	0	6	0	0	14	11	3
Control Delay (s)	9.1	0.0	0.0	8.8	0.0	0.0	24.3	11.2	26.6
Lane LOS	A			A			C	B	D
Approach Delay (s)	0.8			1.0			15.0		26.6
Approach LOS							B		D

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	34.6%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1021: 40th St & Emery St — Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3500		1770	3489			1812	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.46	1.00		0.85	
Satd. Flow (perm)	1770	3500		1770	3489			850	1583		1565	
Volume (vph)	3	269	21	69	514	53	85	86	110	10	20	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	292	23	75	559	58	92	72	120	11	22	4
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	94	0	4	0
Lane Group Flow (vph)	3	311	0	75	612	0	0	164	26	0	33	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	1	6		5	2			7			8	
Permitted Phases							7		7	6		
Actuated Green, G (s)	0.9	49.3		7.4	55.8			22.0	22.0		6.8	
Effective Green, g (s)	0.4	49.3		6.9	55.8			21.5	21.5		6.3	
Actuated g/C Ratio	0.00	0.48		0.07	0.56			0.22	0.22		0.06	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1726		122	1947			183	340		99	
v/s Ratio Prot	0.00	c0.09		c0.04	c0.16							
v/s Ratio Perm								c0.19	0.02		c0.02	
v/c Ratio	0.43	0.18		0.61	0.31			0.90	0.08		0.34	
Uniform Delay, d1	49.7	14.1		45.3	11.8			38.2	31.3		44.8	
Progression Factor	1.00	1.00		1.03	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.2		6.1	0.3			38.3	0.1		1.5	
Delay (s)	77.5	14.3		52.9	7.4			76.5	31.4		46.3	
Level of Service	E	B		D	A			E	C		D	
Approach Delay (s)		14.9			12.4			57.4			46.3	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM Average Control Delay	23.5	HCM Level of Service		C
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	44.1%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1022: 40th St & San Pablo Avenue — Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3369		1770	3379		3433	3533		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3369		1770	3379		3433	3533		1770	3500	
Volume (vph)	92	211	83	29	317	137	259	714	8	135	677	54
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	229	90	32	345	149	282	776	9	147	736	59
RTOR Reduction (vph)	0	49	0	0	50	0	0	1	0	0	5	0
Lane Group Flow (vph)	100	270	0	32	444	0	282	784	0	147	790	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.8	18.1		9.1	18.4		15.0	47.4		12.4	44.8	
Effective Green, g (s)	7.8	17.1		8.1	17.4		14.0	47.4		11.4	44.8	
Actuated g/C Ratio	0.08	0.17		0.08	0.17		0.14	0.47		0.11	0.45	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	138	580		143	586		481	1675		202	1568	
v/s Ratio Prot	c0.06	0.08		0.02	c0.13		c0.08	0.22		c0.08	c0.23	
v/s Ratio Perm												
v/c Ratio	0.72	0.47		0.22	0.75		0.59	0.47		0.73	0.50	
Uniform Delay, d1	45.1	37.3		43.0	39.3		40.3	17.8		42.8	19.7	
Progression Factor	1.29	1.25		1.16	1.13		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.6	0.4		0.3	4.7		1.2	0.9		10.5	1.2	
Delay (s)	72.9	47.2		50.0	49.0		41.5	18.7		53.3	20.8	
Level of Service	E	D		D	D		D	B		D	C	
Approach Delay (s)		53.3			49.1			24.7			25.8	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	33.5	HCM Level of Service		C
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0
Intersection Capacity Utilization	59.4%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1023: 40th St & Adeline St — Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3489		1770	3487			3450			3393	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.88	
Satd. Flow (perm)	1770	3489		1770	3487			3189			2945	
Volume (vph)	48	282	29	6	412	45	9	105	19	60	171	62
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	307	32	7	448	49	10	114	21	65	186	67
RTOR Reduction (vph)	0	12	0	0	14	0	0	18	0	0	49	0
Lane Group Flow (vph)	52	327	0	7	484	0	0	127	0	0	269	0
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		8			
Actuated Green, G (s)	2.9	29.3		1.1	27.5			8.6			8.6	
Effective Green, g (s)	2.4	29.3		0.6	27.5			8.1			8.1	
Actuated g/C Ratio	0.05	0.59		0.01	0.55			0.16			0.16	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	2045		21	1918			517			477	
v/s Ratio Prot	c0.03	0.09		0.00	c0.14							
v/s Ratio Perm								0.04			c0.09	
v/c Ratio	0.61	0.16		0.33	0.25			0.25			0.56	
Uniform Delay, d1	23.3	4.7		24.5	5.9			18.3			19.3	
Progression Factor	0.54	1.42		1.00	1.00			1.00			1.00	
Incremental Delay, d2	8.4	0.2		3.4	0.3			0.3			1.5	
Delay (s)	20.9	6.9		27.9	6.2			18.5			20.8	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		8.8			6.5			18.5			20.8	
Approach LOS		A			A			B			C	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service		B
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	41.7%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	142	50	2	8	67	26	2	1	2	16	4	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	54	2	9	73	28	2	1	2	17	4	95
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	154	57	110	5	116							
Volume Left (vph)	154	0	9	2	17							
Volume Right (vph)	0	2	28	2	95							
Hadj (s)	0.53	0.01	-0.10	0.13	0.42							
Departure Headway (s)	5.4	4.9	4.4	4.7	4.3							
Degree Utilization, x	0.23	0.08	0.13	0.01	0.14							
Capacity (veh/h)	642	715	777	707	785							
Control Delay (s)	8.8	7.1	8.1	7.7	7.9							
Approach Delay (s)	8.4		8.1	7.7	7.9							
Approach LOS	A		A	A	A							
Intersection Summary												
Delay			8.2									
HCM Level of Service			A									
Intersection Capacity Utilization			26.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.88			1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00			0.98	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1637			1820	1583		1851			1832	
Flt Permitted	0.95	1.00			0.98	1.00		0.99			0.98	
Satd. Flow (perm)	1770	1637			1820	1583		1831			1804	
Volume (vph)	110	15	63	12	14	7	15	241	6	10	128	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	16	68	13	15	8	16	262	7	11	139	16
RTOR Reduction (vph)	0	55	0	0	0	8	0	1	0	0	3	0
Lane Group Flow (vph)	120	29	0	0	28	0	0	284	0	0	163	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	9.4	9.4			1.5	1.5		25.7			25.7	
Effective Green, g (s)	8.4	8.4			0.5	0.5		24.7			24.7	
Actuated g/C Ratio	0.16	0.16			0.01	0.01		0.54			0.54	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	326	302			20	17		992			977	
v/s Ratio Prot	c0.07	0.02			c0.02							
v/s Ratio Perm						0.00		c0.16			0.09	
v/c Ratio	0.37	0.09			1.40	0.01		0.29			0.17	
Uniform Delay, d1	16.3	15.4			22.6	22.3		5.7			5.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.3	0.0			344.6	0.0		0.1			0.0	
Delay (s)	16.5	15.5			367.1	22.3		5.7			5.3	
Level of Service	B	B			F	C		A			A	
Approach Delay (s)		16.1			290.5			5.7			5.3	
Approach LOS		B			F			A			A	
Intersection Summary												
HCM Average Control Delay			23.5		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			45.6		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			36.8%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.98	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		3456			3427			3505			3479	
Flt Permitted		0.79			0.98			1.00			1.00	
Satd. Flow (perm)		2763			3427			3505			3479	
Volume (vph)	51	103	9	77	117	20	0	898	62	0	703	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	112	10	84	127	22	0	976	67	0	764	98
RTOR Reduction (vph)	0	4	0	0	8	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	173	0	0	225	0	0	1039	0	0	855	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.7			11.0			67.3			67.3	
Effective Green, g (s)		11.7			12.0			69.3			69.3	
Actuated g/C Ratio		0.11			0.11			0.66			0.66	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		308			392			2313			2296	
v/s Ratio Prot					c0.07			c0.30			0.25	
v/s Ratio Perm		c0.06										
v/c Ratio		0.56			0.57			0.45			0.37	
Uniform Delay, d1		44.2			44.1			8.8			8.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			1.3			0.6			0.5	
Delay (s)		45.6			45.3			9.3			8.5	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			45.3			9.3			8.5	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM Average Control Delay			15.4		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			47.9%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3508	1583		3535			5073	
Flt Permitted					0.99	1.00		0.93			1.00	
Satd. Flow (perm)					3508	1583		3295			5073	
Volume (vph)	0	0	0	85	296	683	12	454	0	0	687	11
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	322	721	13	493	0	0	747	12
RTOR Reduction (vph)	0	0	0	0	0	231	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	393	490	0	506	0	0	757	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					32.6	32.6		58.4			58.4	
Effective Green, g (s)					32.6	32.6		59.4			59.4	
Actuated g/C Ratio					0.33	0.33		0.59			0.59	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1144	516		1957			3013	
v/s Ratio Prot					0.11						0.15	
v/s Ratio Perm						c0.31		c0.15				
v/c Ratio					0.34	0.95		0.26			0.25	
Uniform Delay, d1					25.6	32.9		9.7			9.7	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	27.4		0.3			0.2	
Delay (s)					25.6	60.3		10.1			9.8	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			46.1			10.1			9.8	
Approach LOS		A			D			B			A	
Intersection Summary												
HCM Average Control Delay			27.8		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			60.6%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↑↑	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3415						3482		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3415						3482		3433	3539	
Volume (vph)	16	160	47	0	0	0	0	448	54	221	499	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	174	51	0	0	0	0	487	59	240	542	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	197	0	0	0	0	0	538	0	240	542	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		7.8						39.1		9.1	53.2	
Effective Green, g (s)		8.8						39.1		10.1	53.2	
Actuated g/C Ratio		0.13						0.56		0.14	0.76	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		429						1945		495	2690	
v/s Ratio Prot		c0.06						c0.15		c0.07	0.15	
v/s Ratio Perm												
v/c Ratio		0.46						0.28		0.48	0.20	
Uniform Delay, d1		28.4						8.1		27.6	2.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		0.3						0.4		0.3	0.0	
Delay (s)		28.7						8.4		27.8	2.4	
Level of Service		C						A		C	A	
Approach Delay (s)		28.7			0.0			8.4			10.2	
Approach LOS		C			A			A			B	

Intersection Summary				
HCM Average Control Delay	12.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	36.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frt		1.00			1.00			1.00			1.00	0.85
Flt Protected		0.95			0.95			1.00			0.95	1.00
Satd. Flow (prot)		1770			1770			1770			1770	1583
Flt Permitted		0.95			0.95			1.00			0.95	1.00
Satd. Flow (perm)		1770			1770			1770			1770	1583
Volume (vph)		263	614	138	105	745	52	176	416	116	130	262	461
Peak-hour factor, PHF		0.92	0.92	0.92	0.82	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)		286	667	150	114	810	57	193	452	126	141	285	501
RTOR Reduction (vph)		0	16	0	0	4	0	0	23	0	0	0	313
Lane Group Flow (vph)		286	801	0	114	863	0	193	555	0	141	285	188
Turn Type		Prot			Prot			Split			Split		Perm
Protected Phases		5	2		1	8		8	8		7	7	
Permitted Phases													7
Actuated Green, G (s)		20.4	41.9		11.5	33.0		19.6	19.6		20.0	20.0	20.0
Effective Green, g (s)		20.4	42.9		11.5	34.0		19.6	19.6		20.0	20.0	20.0
Actuated g/C Ratio		0.19	0.39		0.10	0.31		0.18	0.18		0.18	0.18	0.18
Clearance Time (s)		4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)		328	1342		185	1083		315	610		322	339	288
v/s Ratio Prot		c0.16	0.23		0.06	c0.25		0.11	c0.18		0.08	c0.15	
v/s Ratio Perm													0.12
v/c Ratio		0.87	0.60		0.62	0.80		0.61	0.91		0.44	0.84	0.65
Uniform Delay, d1		43.5	26.7		47.1	34.6		41.7	44.3		40.0	43.5	41.8
Progression Factor		1.00	1.00		1.34	0.63		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2		21.5	2.0		4.5	4.6		2.4	14.7		1.0	16.9	5.2
Delay (s)		65.1	28.6		67.5	26.7		44.2	59.5		41.0	60.3	47.0
Level of Service		E	C		E	C		D	E		D	E	D
Approach Delay (s)		38.1			31.4				55.7			50.2	
Approach LOS		D			C				E			D	

Intersection Summary				
HCM Average Control Delay	42.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3426			3438		1770	3484		1770	3472	
Flt Permitted	0.14	1.00			0.76		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	259	3426			2609		1770	3484		1770	3472	
Volume (vph)	96	586	159	37	606	142	172	935	108	181	801	117
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	639	173	40	681	154	187	1016	117	197	871	127
RTOR Reduction (vph)	0	27	0	0	20	0	0	7	0	0	9	0
Lane Group Flow (vph)	104	785	0	0	835	0	187	1126	0	197	989	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	35.8	35.8			35.8		15.2	46.2		15.0	46.0	
Effective Green, g (s)	35.8	35.8			35.8		15.2	47.2		15.0	47.0	
Actuated g/C Ratio	0.33	0.33			0.33		0.14	0.43		0.14	0.43	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	84	1115			849		245	1495		241	1483	
v/s Ratio Prot		0.23					0.11	c0.32		c0.11	0.28	
v/s Ratio Perm	c0.40				0.32							
v/c Ratio	1.24	0.70			0.98		0.76	0.75		0.82	0.67	
Uniform Delay, d1	37.1	32.5			36.8		45.7	26.5		46.2	25.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	184.6	1.8			26.6		13.2	3.6		18.9	2.4	
Delay (s)	203.8	34.1			63.4		58.8	30.0		65.1	27.6	
Level of Service	F	D			E		E	C		E	C	
Approach Delay (s)		55.1			63.4			34.1			33.8	
Approach LOS		E			E			C			C	

Intersection Summary				
HCM Average Control Delay	44.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	122	17	0	2	1	198	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	21	0	133	18	0	2	1	215	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	18			21			307	307	21	522	307	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			21			307	307	21	522	307	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	80	100	100	100
cM capacity (veh/h)	1598			1595			603	556	1057	346	556	1060

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	151	218	2
Volume Left	1	133	2	1
Volume Right	0	0	215	0
cSH	1598	1595	1044	427
Volume to Capacity	0.00	0.08	0.21	0.01
Queue Length 95th (ft)	0	7	20	0
Control Delay (s)	0.4	6.8	9.4	13.5
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	6.8	9.4	13.5
Approach LOS			A	B

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	33.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↰	↳		↔			↰	↳
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	159	78	6	186	85	106	10	432	308	16	256	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	173	85	7	204	92	115	11	470	335	17	278	72

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	173	91	204	208	815	17	350
Volume Left (vph)	173	0	204	0	11	17	0
Volume Right (vph)	0	7	0	115	335	0	72
Hadj (s)	0.53	0.02	0.53	0.35	0.21	0.53	0.11
Departure Headway (s)	9.0	8.5	8.7	7.9	7.5	8.5	7.9
Degree Utilization, x	0.43	0.22	0.50	0.45	1.71	0.04	0.77
Capacity (veh/h)	375	407	401	445	482	410	444
Control Delay (s)	17.0	12.8	18.9	16.1	346.8	10.7	31.6
Approach Delay (s)	15.9		17.5		346.8	30.5	
Approach LOS	C		C		F	D	

Intersection Summary				
Delay	164.3			
HCM Level of Service	F			
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↰	↱
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	402	0	0	379	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	437	0	0	412	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None		
Median storage veh)						
Upstream signal (ft)				743		
pX, platoon unblocked						
vC, conflicting volume			437		849	437
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			437		849	437
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1123		331	620

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	437	412	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1123	1700
Volume to Capacity	0.26	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↰	↳		↰	↳
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1769			1804		1770	1843		1770	1742	
Flt Permitted		0.79			0.87		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1421			1581		1770	1843		1770	1742	
Volume (vph)	178	194	68	38	115	20	183	604	39	19	317	144
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	211	74	39	125	22	177	657	42	21	345	157
RTOR Reduction (vph)	0	12	0	0	9	0	0	4	0	0	30	0
Lane Group Flow (vph)	0	466	0	0	177	0	177	695	0	21	472	0
Confl. Peds. (#/hr)	14		4	4		14		5				20
Confl. Bikes (#/hr)			4			2		4				11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		413			460		222	875		29	637	
v/s Ratio Prot							c0.10	c0.38		0.01	0.27	
v/s Ratio Perm		c0.33			0.11							
v/c Ratio		1.13			0.39		0.80	0.79		0.72	0.74	
Uniform Delay, d1		19.5			15.6		23.4	12.2		26.9	15.2	
Progression Factor		1.00			1.00		0.90	1.04		0.97	1.00	
Incremental Delay, d2		84.0			0.4		14.6	6.2		53.0	6.7	
Delay (s)		103.5			16.0		35.7	18.9		79.1	23.3	
Level of Service		F			B		D	B		E	C	
Approach Delay (s)		103.5			16.0			22.3			25.5	
Approach LOS		F			B			C			C	

Intersection Summary					
HCM Average Control Delay	41.4	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	55.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	52	0	11	17	202	66	5	118	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	15	64	57	0	12	18	220	72	5	128	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	84	68	310	135
Volume Left (vph)	4	57	18	5
Volume Right (vph)	64	12	72	1
Hadj (s)	-0.42	0.09	-0.09	0.04
Departure Headway (s)	4.6	5.1	4.4	4.7
Degree Utilization, x	0.11	0.10	0.37	0.17
Capacity (veh/h)	701	633	798	726
Control Delay (s)	8.2	8.7	9.9	8.7
Approach Delay (s)	8.2	8.7	9.9	8.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay	9.3			
HCM Level of Service	A			
Intersection Capacity Utilization	38.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	119	47	25	621	393	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	51	27	675	416	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1184	454	492			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1184	454	492			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	92	97			
cM capacity (veh/h)	204	606	1071			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	180	27	675	492
Volume Left	129	27	0	0
Volume Right	51	0	0	76
cSH	251	1071	1700	1700
Volume to Capacity	0.72	0.03	0.40	0.29
Queue Length 95th (ft)	123	2	0	0
Control Delay (s)	49.0	8.4	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	49.0	0.3	0.0	
Approach LOS	E			

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBL	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	1.00		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3403		3539	1488		3531
Flt Permitted	0.96		1.00	1.00		0.93
Satd. Flow (perm)	3403		3539	1488		3277
Volume (vph)	844	57	453	350	24	692
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	917	62	492	380	26	752
RTOR Reduction (vph)	5	0	0	207	0	0
Lane Group Flow (vph)	974	0	492	173	0	778
Confl. Peds. (#/hr)		25		19	19	
Confl. Bikes (#/hr)		2		3		
Turn Type			Perm	Perm		
Protected Phases	4		2			6
Permitted Phases				2		6
Actuated Green, G (s)	52.5		50.5	50.5		50.5
Effective Green, g (s)	52.0		50.0	50.0		50.0
Actuated g/C Ratio	0.47		0.45	0.45		0.45
Clearance Time (s)	3.5		3.5	3.5		3.5
Lane Grp Cap (vph)	1609		1609	676		1490
v/s Ratio Prot	c0.29		0.14			
v/s Ratio Perm				0.12		c0.24
v/c Ratio	0.61		0.31	0.26		0.52
Uniform Delay, d1	21.4		19.0	18.5		21.5
Progression Factor	0.51		0.14	1.04		1.00
Incremental Delay, d2	1.4		0.0	0.1		1.3
Delay (s)	12.2		2.7	19.3		22.8
Level of Service	B		A	B		C
Approach Delay (s)	12.2		10.0			22.8
Approach LOS	B		A			C

Intersection Summary					
HCM Average Control Delay	14.8	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.56				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	69.2%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	333	34	472	638	257	429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	362	37	513	693	279	466
RTOR Reduction (vph)	0	19	0	0	0	194
Lane Group Flow (vph)	362	18	513	693	279	272
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	25.7	55.4	26.2	77.3	47.6	25.7
Effective Green, g (s)	25.2	54.9	25.7	76.8	47.1	25.2
Actuated g/C Ratio	0.23	0.50	0.23	0.70	0.43	0.23
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	405	790	802	1301	798	363
v/s Ratio Prot	c0.20	0.01	c0.15	c0.37	0.15	0.17
v/s Ratio Perm						
v/c Ratio	0.89	0.02	0.64	0.53	0.35	0.76
Uniform Delay, d1	41.1	14.0	38.0	8.0	21.1	39.5
Progression Factor	0.38	0.01	0.53	0.64	1.00	1.00
Incremental Delay, d2	19.9	0.0	1.4	1.3	1.2	6.2
Delay (s)	35.7	0.1	21.6	6.3	22.4	47.7
Level of Service	D	A	C	A	C	D
Approach Delay (s)	32.4			12.8	38.2	
Approach LOS	C			B	D	

Intersection Summary					
HCM Average Control Delay	24.2	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	63.6%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1861	1690		1770	3539	1583	1770	1825	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1690		1770	3539	1583	1770	1825	
Volume (vph)	172	370	60	504	14	0	11	654	1441	252	525	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	402	65	548	15	0	12	711	1566	274	571	51
RTOR Reduction (vph)	0	0	17	0	0	0	0	0	0	0	3	0
Lane Group Flow (vph)	187	402	48	274	289	0	12	711	1566	274	619	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												16
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.4	16.4	16.4	18.6	18.6		1.1	22.9	90.1	16.7	38.5	
Effective Green, g (s)	15.9	15.9	15.9	18.6	18.6		0.6	23.4	90.1	16.2	39.0	
Actuated g/C Ratio	0.18	0.18	0.18	0.21	0.21		0.01	0.26	1.00	0.18	0.43	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	312	329	279	347	349		12	919	1583	318	790	
v/s Ratio Prot	0.11	0.22		0.16	0.17		0.01	0.20		0.15	0.34	
v/s Ratio Perm			0.03						c0.99			
v/c Ratio	0.60	1.22	0.17	0.79	0.83		1.00	0.77	0.99	0.86	0.78	
Uniform Delay, d1	34.2	37.1	31.5	33.9	34.2		44.8	30.9	0.0	35.9	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	124.1	0.1	11.0	14.6		259.8	3.9	20.2	20.0	4.9	
Delay (s)	36.2	161.2	31.6	44.9	48.8		304.6	34.8	20.2	55.8	26.8	
Level of Service	D	F	C	D	D		F	C	C	E	C	
Approach Delay (s)		112.6			46.9			26.2			35.7	
Approach LOS		F			D			C			D	

Intersection Summary					
HCM Average Control Delay	43.6	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	90.1	Sum of lost time (s)		0.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3225			2944	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3225			2944	1399				3433		1583
Volume (vph)	140	394	672	0	521	1867	0	0	0	801	0	330
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	428	822	0	566	2029	0	0	0	871	0	359
RTOR Reduction (vph)	0	218	0	0	214	0	0	0	0	0	0	238
Lane Group Flow (vph)	152	832	0	0	1138	1243	0	0	0	871	0	121
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	70.0			46.0	110.0				31.5		31.5
Effective Green, g (s)	20.0	70.0			46.0	110.0				32.0		32.0
Actuated g/C Ratio	0.18	0.64			0.42	1.00				0.29		0.29
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	2052			1231	1399				999		461
v/s Ratio Prot	0.09	0.26			0.39							0.08
v/s Ratio Perm						c0.89				0.25		
v/c Ratio	0.47	0.41			0.99dr	0.89				0.87		0.26
Uniform Delay, d1	40.3	9.8			30.4	0.0				37.1		29.9
Progression Factor	1.00	1.00			0.71	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			1.5	0.9				8.4		0.2
Delay (s)	40.7	10.4			23.1	0.9				45.5		30.2
Level of Service	D	B			C	A				D		C
Approach Delay (s)		14.2			12.5			0.0			41.0	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	19.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	77.2%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.85	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.90	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1521	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1521	659			
Volume (vph)	141	1054	0	0	1838	484	550	226	983	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1146	0	0	1998	526	598	246	1068	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	263	0	71	13	0	0	0
Lane Group Flow (vph)	153	1146	0	0	1998	263	598	708	522	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	338	1489			1687	490	585	512	336			
v/s Ratio Prot	0.09	c0.32			c0.43		0.36	0.47	c0.79			
v/s Ratio Perm						0.20						
v/c Ratio	0.45	0.77			1.18	0.54	1.06	1.38	1.56			
Uniform Delay, d1	39.4	27.5			35.0	27.7	36.5	36.5	27.0			
Progression Factor	1.55	0.38			0.94	1.09	1.00	1.00	1.00			
Incremental Delay, d2	3.2	2.9			85.6	1.7	54.3	184.1	265.1			
Delay (s)	64.3	13.3			118.5	31.7	90.8	220.6	292.1			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		19.3			100.4			200.0			0.0	
Approach LOS		B			F			F			A	

Intersection Summary				
HCM Average Control Delay	115.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.40			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1806	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3326	1219	1770	3539	1583	1681	1702	1583		1806	2628
Volume (vph)	601	785	671	259	989	223	132	16	66	276	163	1086
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	653	832	729	282	1075	242	143	17	72	302	177	1180
RTOR Reduction (vph)	0	7	140	0	0	31	0	0	63	0	0	85
Lane Group Flow (vph)	653	918	496	282	1075	211	78	62	9	0	479	1095
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.6	51.6	17.0	32.5	32.5	14.5	14.5	14.5		30.6	46.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	998	565	274	1062	475	214	217	201		493	1123
v/s Ratio Prot	c0.19	0.28	c0.41	0.16	c0.30		0.05	0.06			0.27	c0.42
v/s Ratio Perm						0.13			0.01			
v/c Ratio	1.23	0.92	0.88	1.03	1.01	0.44	0.36	0.28	0.05		0.97	0.98
Uniform Delay, d1	46.5	37.2	26.7	46.5	38.5	31.1	43.9	44.0	42.1		39.6	30.9
Progression Factor	1.22	1.00	1.00	1.00	1.00	1.00	1.02	1.02	2.14		0.74	0.72
Incremental Delay, d2	105.0	1.8	1.6	62.1	30.7	3.0	0.7	0.8	0.1		30.5	19.2
Delay (s)	161.7	39.9	29.8	108.6	69.2	34.1	45.7	45.8	90.1		59.8	41.5
Level of Service	F	D	C	F	E	C	D	D	F		E	D
Approach Delay (s)		72.5			70.8			59.5			46.8	
Approach LOS		E			E			E			D	

Intersection Summary				
HCM Average Control Delay	64.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3523			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3523			1863	
Volume (vph)	74	143	711	47	0	97	0	939	25	0	291	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	155	773	51	0	105	0	1021	27	0	316	0
RTOR Reduction (vph)	0	0	381	0	0	98	0	2	0	0	0	0
Lane Group Flow (vph)	80	155	392	51	0	7	0	1046	0	0	316	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	41.0	41.0	51.6	8.0		8.0		50.5			39.9	
Effective Green, g (s)	40.5	40.5	51.1	7.5		7.5		50.0			39.4	
Actuated g/C Ratio	0.37	0.37	0.46	0.07		0.07		0.45			0.36	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	593	1248	1295	121		108		1601			667	
v/s Ratio Prot	0.05	0.05	c0.14	c0.03				c0.30			0.17	
v/s Ratio Perm						0.00						
v/c Ratio	0.13	0.12	0.30	0.42		0.07		0.65			0.47	
Uniform Delay, d1	23.1	23.0	18.3	49.2		46.0		23.3			27.3	
Progression Factor	1.23	1.22	2.37	1.00		1.00		1.00			1.47	
Incremental Delay, d2	0.5	0.2	0.1	1.7		0.2		2.1			2.3	
Delay (s)	28.8	28.2	43.8	50.9		46.2		25.4			42.5	
Level of Service	C	C	D	D		D		C			D	
Approach Delay (s)		40.0			49.1			25.4			42.5	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM Average Control Delay	34.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3395		1770	3468		1770	1843		1770	1863	1537
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3395		1770	3468		1770	1843		1770	1863	1537
Volume (vph)	169	712	184	20	583	55	514	419	27	56	198	156
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	774	200	22	634	60	559	455	29	63	215	170
RTOR Reduction (vph)	0	20	0	0	6	0	0	2	0	0	0	146
Lane Group Flow (vph)	184	954	0	22	688	0	559	482	0	63	215	24
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	30.4		2.6	22.5		46.0	46.0		16.0	16.0	16.0
Effective Green, g (s)	10.0	30.9		2.1	23.0		45.5	45.5		15.5	15.5	15.5
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.41	0.41		0.14	0.14	0.14
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	954		34	725		732	762		249	263	217
v/s Ratio Prot	0.10	c0.28		0.01	c0.20		c0.32	0.26		0.04	c0.12	
v/s Ratio Perm												0.02
v/c Ratio	1.14	1.00		0.65	0.95		0.76	0.63		0.25	0.82	0.11
Uniform Delay, d1	50.0	39.5		53.6	42.9		27.6	25.6		42.1	45.9	41.2
Progression Factor	1.00	1.00		1.00	1.00		0.98	1.00		1.07	1.04	1.76
Incremental Delay, d2	114.5	29.1		35.3	23.0		4.7	1.7		0.5	16.7	0.2
Delay (s)	164.5	68.7		88.8	65.9		31.9	27.3		45.6	64.3	72.9
Level of Service	F	E		F	E		C	C		D	E	E
Approach Delay (s)		83.9			66.6			29.6			64.9	
Approach LOS		F			E			C			E	

Intersection Summary			
HCM Average Control Delay	60.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3414		1770	3467		1770	3483		1770	3483	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3414		1770	3467		1770	3483		1770	3483	
Volume (vph)	128	602	186	100	388	61	140	978	116	112	866	109
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	654	202	109	422	66	152	1063	126	122	941	118
RTOR Reduction (vph)	0	33	0	0	14	0	0	10	0	0	9	0
Lane Group Flow (vph)	139	823	0	109	474	0	152	1179	0	122	1044	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.4	24.3		8.4	22.3		11.9	32.3		10.0	30.4	
Effective Green, g (s)	9.4	24.8		7.4	22.8		10.9	32.8		9.0	30.9	
Actuated g/C Ratio	0.10	0.26		0.08	0.25		0.12	0.36		0.10	0.34	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	941		146	878		214	1269		177	1196	
v/s Ratio Prot	c0.08	c0.24		0.06	0.14		c0.09	c0.34		0.07	0.30	
v/s Ratio Perm												
v/c Ratio	0.75	0.88		0.75	0.54		0.71	0.93		0.69	0.87	
Uniform Delay, d1	39.2	31.1		40.4	29.1		36.0	27.5		39.1	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.7	9.1		18.6	0.6		10.6	13.2		10.6	6.9	
Delay (s)	54.9	40.2		59.0	29.7		46.6	40.7		49.8	34.6	
Level of Service	D	D		E	C		D	D		D	D	
Approach Delay (s)		42.3			35.1			41.6			38.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.92			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3372		1770	3539	1524	1770	1685			1805	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3372		1770	3539	1524	1770	1685			1805	
Volume (vph)	24	601	224	80	696	27	208	106	106	42	106	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	653	243	87	648	29	226	115	117	46	115	21
RTOR Reduction (vph)	0	28	0	0	0	15	0	41	0	0	5	0
Lane Group Flow (vph)	26	868	0	87	648	14	226	191	0	0	177	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			8			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.2	44.3		7.9	49.0	49.0	17.6	17.6			15.7	
Effective Green, g (s)	2.7	44.3		7.4	49.0	49.0	17.1	17.1			15.2	
Actuated g/C Ratio	0.03	0.44		0.07	0.49	0.49	0.17	0.17			0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	48	1494		131	1734	747	303	288			274	
v/s Ratio Prot	0.01	c0.26		c0.05	0.18		c0.13	0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.54	0.58		0.66	0.37	0.02	0.75	0.66			0.65	
Uniform Delay, d1	48.0	20.9		45.1	15.9	13.1	39.4	38.7			39.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	9.5	1.7		10.8	0.6	0.0	9.1	5.1			4.6	
Delay (s)	57.5	22.5		55.9	16.5	13.2	48.5	43.8			44.4	
Level of Service	E	C		E	B	B	D	D			D	
Approach Delay (s)		23.5			20.9			46.1			44.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3415		1770	3539	1496	1770	1863	1520	1770	1812	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3415		1770	3539	1496	1770	1863	1520	1770	1812	
Volume (vph)	46	544	129	141	490	182	188	279	116	207	311	51
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	591	140	153	541	198	204	303	126	225	338	55
RTOR Reduction (vph)	0	18	0	0	0	115	0	0	95	0	6	0
Lane Group Flow (vph)	50	713	0	153	541	83	204	303	30	225	387	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	6.7	36.6		12.1	42.0	42.0	12.5	24.3	24.3	12.5	24.3	
Effective Green, g (s)	6.2	36.6		11.6	42.0	42.0	12.0	23.8	23.8	12.0	23.8	
Actuated g/C Ratio	0.06	0.37		0.12	0.42	0.42	0.12	0.24	0.24	0.12	0.24	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	110	1250		205	1486	628	212	443	362	212	431	
v/s Ratio Prot	0.03	c0.21		c0.09	0.15		0.12	0.16		c0.13	c0.21	
v/s Ratio Perm						0.06			0.02			
v/c Ratio	0.45	0.57		0.75	0.36	0.13	0.96	0.68	0.08	1.06	0.90	
Uniform Delay, d1	45.3	25.4		42.8	19.9	17.8	43.8	34.7	29.6	44.0	36.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	
Incremental Delay, d2	2.2	1.9		13.1	0.7	0.4	50.8	4.0	0.1	77.1	19.8	
Delay (s)	47.4	27.3		55.8	20.5	18.2	94.6	38.6	29.7	120.1	55.2	
Level of Service	D	C		E	C	B	F	D	C	F	E	
Approach Delay (s)		28.6			26.1			54.9			78.8	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	44.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	790	44	86	814	12	33	12	96	0	8	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	859	48	104	885	13	36	13	107	0	9	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		350			326							
pX, platoon unblocked												
vC, conflicting volume	898			907			1696	2037	453	1690	2054	449
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	898			907			1596	2037	453	1690	2054	449
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			86			32	72	81	100	81	98
cM capacity (veh/h)	752			746			62	47	664	34	46	657

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	24	572	334	104	590	308	42	113	19
Volume Left	24	0	0	104	0	0	36	0	0
Volume Right	0	0	48	0	0	13	0	107	10
cSH	752	1700	1700	746	1700	1700	51	341	89
Volume to Capacity	0.03	0.34	0.20	0.14	0.35	0.18	0.82	0.33	0.21
Queue Length 95th (ft)	2	0	0	12	0	0	86	35	18
Control Delay (s)	9.9	0.0	0.0	10.6	0.0	0.0	201.1	20.7	56.0
Lane LOS	A			B			F	C	F
Approach Delay (s)	0.3			1.1			69.9		56.0
Approach LOS							F		F

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3453		1770	3482			1808	1555		1811	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3453		1770	3482			1808	1555		1811	
Volume (vph)	30	788	101	124	735	57	182	120	235	27	130	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	857	110	135	799	62	198	130	255	29	141	21
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	182	0	4	0
Lane Group Flow (vph)	33	959	0	135	856	0	0	328	73	0	187	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	6.7	37.5		11.4	40.2			21.5	21.5		15.1	
Effective Green, g (s)	8.2	37.5		10.9	40.2			21.0	21.0		14.6	
Actuated g/C Ratio	0.06	0.30		0.11	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1295		193	1400			380	327		264	
v/s Ratio Prot	0.02	c0.28		c0.08	0.25			c0.18			c0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.23	0.75		0.70	0.61			0.86	0.22		0.71	
Uniform Delay, d1	42.9	27.1		43.0	23.7			38.1	32.7		40.7	
Progression Factor	1.00	1.00		1.19	0.61			1.00	1.00		1.00	
Incremental Delay, d2	0.6	4.0		3.5	0.7			17.8	0.3		7.8	
Delay (s)	43.5	31.1		54.4	15.2			55.9	33.0		48.4	
Level of Service	D	C		D	B			E	C		D	
Approach Delay (s)		31.5			20.5			45.9			48.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c - Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3289		1770	3373		3433	3529		1770	3467	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3289		1770	3373		3433	3529		1770	3467	
Volume (vph)	205	544	314	48	398	146	422	952	15	222	968	102
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	591	341	50	433	159	459	1035	16	241	1052	111
RTOR Reduction (vph)	0	81	0	0	38	0	0	1	0	0	8	0
Lane Group Flow (vph)	223	851	0	50	554	0	459	1050	0	241	1155	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.3	28.6		5.6	18.9		14.0	37.5		15.3	38.8	
Effective Green, g (s)	14.3	27.6		4.6	17.9		13.0	37.5		14.3	38.8	
Actuated g/C Ratio	0.14	0.28		0.05	0.18		0.13	0.38		0.14	0.39	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	253	908		81	604		446	1323		253	1345	
v/s Ratio Prot	c0.13	c0.26		0.03	0.16		c0.13	0.30		c0.14	c0.33	
v/s Ratio Perm												
v/c Ratio	0.88	0.94		0.62	0.92		1.03	0.79		0.95	0.86	
Uniform Delay, d1	42.0	35.4		46.8	40.3		43.5	27.8		42.5	28.1	
Progression Factor	0.62	0.78		1.03	0.93		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.5	13.1		9.1	16.0		50.3	5.0		43.1	7.3	
Delay (s)	47.5	40.7		57.3	55.4		93.8	32.8		85.6	35.4	
Level of Service	D	D		E	E		F	C		F	D	
Approach Delay (s)		42.0			55.5			51.3			44.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	47.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c - Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.99			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3525		1770	3440			3469			3314	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.82	
Satd. Flow (perm)	1770	3525		1770	3440			3156			2746	
Volume (vph)	16	664	16	9	460	89	19	212	23	75	166	105
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	722	17	10	500	97	21	230	25	82	180	115
RTOR Reduction (vph)	0	3	0	0	23	0	0	16	0	0	95	0
Lane Group Flow (vph)	17	736	0	10	574	0	0	260	0	0	282	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.2	28.7		1.1	28.6			9.2			9.2	
Effective Green, g (s)	0.7	28.7		0.6	28.6			8.7			8.7	
Actuated g/C Ratio	0.01	0.57		0.01	0.57			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	25	2023		21	1968			549			478	
v/s Ratio Prot	c0.01	c0.21		0.01	0.17							
v/s Ratio Perm								0.08			c0.10	
v/c Ratio	0.68	0.36		0.48	0.29			0.47			0.59	
Uniform Delay, d1	24.5	5.7		24.5	5.5			18.6			19.0	
Progression Factor	1.00	1.26		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.8	0.2		6.1	0.4			0.6			1.9	
Delay (s)	43.0	7.3		30.6	5.9			19.2			20.9	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		8.1			6.3			19.2			20.9	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c - Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	297	75	11	86	78	46	19	83	50	65	59	232
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	323	82	12	93	85	50	21	90	54	71	64	252
Direction, Lane #	EB 1	WB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	323	93	228	165	387							
Volume Left (vph)	323	0	93	21	71							
Volume Right (vph)	0	12	50	54	252							
Hadj (s)	0.53	-0.06	-0.02	-0.14	-0.32							
Departure Headway (s)	7.3	6.7	6.7	6.6	6.0							
Degree Utilization, x	0.66	0.17	0.43	0.31	0.65							
Capacity (veh/h)	465	510	478	459	563							
Control Delay (s)	22.0	9.9	14.7	12.8	19.5							
Approach Delay (s)	19.3		14.7	12.8	19.5							
Approach LOS	C		B	B	C							
Intersection Summary												
Delay			17.6									
HCM Level of Service			C									
Intersection Capacity Utilization			70.1%		ICU Level of Service						C	
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery St

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.99			1.00	
Flt Protected	0.95	1.00			0.97	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1695			1814	1583		1637			1849	
Flt Permitted	0.95	1.00			0.97	1.00		0.95			0.97	
Satd. Flow (perm)	1770	1695			1814	1583		1746			1805	
Volume (vph)	179	36	57	19	17	24	34	280	23	21	333	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	41	62	21	18	26	37	314	25	23	362	14
RTOR Reduction (vph)	0	49	0	0	0	25	0	2	0	0	1	0
Lane Group Flow (vph)	195	54	0	0	39	1	0	374	0	0	398	0
Turn Type	Split			Split		Perm	Perm			Perm		
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	10.5	10.5			2.7	2.7		24.7			24.7	
Effective Green, g (s)	9.5	9.5			1.7	1.7		23.7			23.7	
Actuated g/C Ratio	0.20	0.20			0.04	0.04		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	359	343			66	57		882			912	
v/s Ratio Prot	c0.11	0.03			c0.02							
v/s Ratio Perm						0.00		0.21			c0.22	
v/c Ratio	0.54	0.16			0.59	0.02		0.42			0.44	
Uniform Delay, d1	16.8	15.4			22.3	21.8		7.3			7.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.9	0.1			9.1	0.0		0.1			0.1	
Delay (s)	17.7	15.5			31.3	21.8		7.4			7.5	
Level of Service	B	B			C	C		A			A	
Approach Delay (s)		16.9			27.5			7.4			7.5	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM Average Control Delay			11.1		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			49.9		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			51.1%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3459			3401			3510			3501	
Flt Permitted		0.77			0.98			1.00			1.00	
Satd. Flow (perm)		2720			3401			3510			3501	
Volume (vph)	73	162	14	98	123	36	0	1125	66	0	1238	96
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	176	15	104	134	39	0	1223	72	0	1346	104
RTOR Reduction (vph)	0	4	0	0	13	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	266	0	0	264	0	0	1292	0	0	1445	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		14.0			12.2			62.8			62.8	
Effective Green, g (s)		15.0			13.2			64.8			64.8	
Actuated g/C Ratio		0.14			0.13			0.62			0.62	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		389			428			2166			2161	
v/s Ratio Prot					c0.08			0.37			c0.41	
v/s Ratio Perm		c0.10										
v/c Ratio		0.68			0.62			0.60			0.67	
Uniform Delay, d1		42.7			43.5			12.2			13.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			1.9			1.2			1.7	
Delay (s)		46.7			45.4			13.4			14.8	
Level of Service		D			D			B			B	
Approach Delay (s)		46.7			45.4			13.4			14.8	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay			19.4		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			81.7%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3502	1583		3535			5073	
Flt Permitted					0.99	1.00		0.90			1.00	
Satd. Flow (perm)					3502	1583		3181			5073	
Volume (vph)	0	0	0	64	237	549	19	830	0	0	1225	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	70	258	597	21	902	0	0	1332	22
RTOR Reduction (vph)	0	0	0	0	0	110	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	328	487	0	923	0	0	1352	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1051	475		1944			3100	
v/s Ratio Prot					0.09						0.27	
v/s Ratio Perm						c0.31		c0.29				
v/c Ratio					0.31	1.03		0.47			0.44	
Uniform Delay, d1					24.3	31.5		9.6			9.3	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	47.9		0.8			0.4	
Delay (s)					24.4	79.4		10.4			9.7	
Level of Service					C	E		B			A	
Approach Delay (s)		0.0			59.9			10.4			9.7	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM Average Control Delay			24.4		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			64.2%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.96						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3459						3492		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3459						3492		3433	3539	
Volume (vph)	28	470	78	0	0	0	0	797	78	592	733	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	511	85	0	0	0	0	866	85	643	797	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	614	0	0	0	0	0	945	0	643	797	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		22.8						49.1		24.1	76.2	
Effective Green, g (s)		23.8						49.1		26.1	76.2	
Actuated g/C Ratio		0.22						0.46		0.23	0.71	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		748						1559		783	2516	
v/s Ratio Prot		c0.18						c0.27		c0.19	0.23	
v/s Ratio Perm												
v/c Ratio		0.82						0.61		0.82	0.32	
Uniform Delay, d1		41.1						23.1		40.3	5.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		6.9						1.8		6.6	0.0	
Delay (s)		48.0						24.9		46.9	6.0	
Level of Service		D						C		D	A	
Approach Delay (s)		48.0			0.0			24.9			24.2	
Approach LOS		D			A			C			C	

Intersection Summary				
HCM Average Control Delay	29.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	80	12	1	0	3	164	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	87	13	1	0	3	178	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			13			208	201	13	380	201	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			206	201	13	360	201	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	83	100	99	100
cM capacity (veh/h)	1604			1605			710	657	1067	459	656	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	101	182	12
Volume Left	0	87	0	1
Volume Right	0	1	178	3
cSH	1604	1605	1055	704
Volume to Capacity	0.00	0.06	0.17	0.02
Queue Length 95th (ft)	0	4	15	1
Control Delay (s)	0.0	6.4	9.1	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.4	9.1	10.2
Approach LOS			A	B

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	110	35	13	191	42	20	13	380	279	17	400	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	38	14	208	46	22	14	413	303	18	435	42

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total (vph)	120	52	208	67	730	18	477
Volume Left (vph)	120	0	208	0	14	18	0
Volume Right (vph)	0	14	0	22	303	0	42
Hadj (s)	0.53	-0.16	0.53	-0.19	-0.21	0.53	-0.09
Departure Headway (s)	9.1	8.4	8.7	8.0	7.1	7.8	7.3
Degree Utilization, x	0.30	0.12	0.50	0.15	1.45	0.04	0.96
Capacity (veh/h)	382	410	399	434	507	451	488
Control Delay (s)	14.7	11.4	19.0	11.2	232.5	10.0	57.9
Approach Delay (s)	13.7		17.1		232.5	56.1	
Approach LOS	B		C		F	F	

Intersection Summary			
Delay	122.4		
HCM Level of Service	F		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

Existing Plus Alt#4 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	80	0	0	99	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	108	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				734		
pX, platoon unblocked						
vC, conflicting volume			87		195	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		195	87
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1509		794	972

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	87	108	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1509	1700
Volume to Capacity	0.05	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	8.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	40	3	17	5	148	64	2	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	43	3	18	5	161	70	2	64	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	65	236	66
Volume Left (vph)	0	43	5	2
Volume Right (vph)	14	18	70	0
Hadj (s)	0.49	0.00	0.14	0.04
Departure Headway (s)	4.1	4.6	4.0	4.4
Degree Utilization, x	0.02	0.08	0.26	0.08
Capacity (veh/h)	791	730	871	786
Control Delay (s)	7.2	8.0	8.5	7.7
Approach Delay (s)	7.2	8.0	8.5	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
HCM Level of Service	A		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑	↑	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	91	33	23	625	515	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	36	25	679	560	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1342	812	665			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1342	812	665			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	39	93	97			
cM capacity (veh/h)	183	493	924			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	135	25	679	665
Volume Left	99	25	0	0
Volume Right	36	0	0	105
cSH	199	924	1700	1700
Volume to Capacity	0.68	0.03	0.40	0.39
Queue Length 95th (ft)	104	2	0	0
Control Delay (s)	54.6	9.0	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	54.6	0.3	0.0	
Approach LOS	F			

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

Existing Plus Alt#4 SAT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↱		↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0
Lane Util. Factor	0.97		0.95	1.00		0.95
Frpb, ped/bikes	0.99		1.00	0.94		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.99		1.00	0.85		1.00
Flt Protected	0.96		1.00	1.00		1.00
Satd. Flow (prot)	3393		3539	1492		3529
Flt Permitted	0.96		1.00	1.00		0.92
Satd. Flow (perm)	3393		3539	1492		3241
Volume (vph)	916	76	451	524	26	552
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	996	83	490	570	28	600
RTOR Reduction (vph)	6	0	0	318	0	0
Lane Group Flow (vph)	1075	0	490	252	0	628
Confl. Peds. (#/hr)		26		15	15	
Confl. Bikes (#/hr)		7		9		
Turn Type				Perm	Perm	
Protected Phases	4		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	56.5		46.5	46.5		46.5
Effective Green, g (s)	58.0		46.0	46.0		46.0
Actuated g/C Ratio	0.61		0.42	0.42		0.42
Clearance Time (s)	3.5		3.5	3.5		3.5
Vehicle Extension (s)	2.5		3.0	3.0		3.0
Lane Grp Cap (vph)	1727		1480	624		1355
v/s Ratio Prot	c0.32		0.14			
v/s Ratio Perm				0.17		c0.19
v/c Ratio	0.62		0.33	0.40		0.46
Uniform Delay, d1	19.4		21.6	22.4		23.1
Progression Factor	0.35		0.53	4.07		1.00
Incremental Delay, d2	1.5		0.1	0.2		1.1
Delay (s)	8.2		11.4	91.3		24.2
Level of Service	A		B	F		C
Approach Delay (s)	8.2		54.4			24.2
Approach LOS	A		D			C

Intersection Summary				
HCM Average Control Delay	29.5	HCM Level of Service		C
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↑↑	↑	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	483	51	860	860	269	350
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	525	55	717	924	292	380
RTOR Reduction (vph)	0	23	0	0	0	22
Lane Group Flow (vph)	525	32	717	924	292	358
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	0	6 4
Permitted Phases						
Actuated Green, G (s)	31.5	63.6	28.8	71.5	39.4	74.4
Effective Green, g (s)	31.0	63.1	28.1	71.0	38.9	73.9
Actuated g/C Ratio	0.28	0.57	0.26	0.65	0.35	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	499	908	877	1202	659	1063
v/s Ratio Prot	c0.30	0.02	c0.21	c0.50	0.16	0.23
v/s Ratio Perm						
v/c Ratio	1.05	0.03	0.82	0.77	0.44	0.34
Uniform Delay, d1	39.5	10.2	38.5	13.7	27.2	7.7
Progression Factor	0.50	0.02	0.43	1.39	1.00	1.00
Incremental Delay, d2	50.6	0.0	3.7	2.9	2.2	0.2
Delay (s)	70.3	0.2	20.1	22.0	29.4	7.8
Level of Service	E	A	C	C	C	A
Approach Delay (s)	63.6			21.2	17.2	
Approach LOS	E			C	B	

Intersection Summary				
HCM Average Control Delay	28.8	HCM Level of Service		C
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	78.2%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱		↞			↑↑	↱		↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1833	
Volume (vph)	26	21	7	811	13	16	41	256	1057	120	404	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	882	14	17	45	278	1149	130	439	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	882	449	0	45	278	1149	130	470	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		6	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.4	3.4	3.4	26.6	26.6		3.4	17.6	71.0	7.4	21.6	
Effective Green, g (s)	2.9	2.9	2.9	26.6	26.6		3.4	16.1	71.0	7.4	22.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.37	0.37		0.05	0.25	1.00	0.10	0.31	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	65	630	630		85	902	1583	184	571	
v/s Ratio Prot	0.02	0.01		0.26	0.27		0.03	0.08		0.07	c0.26	
v/s Ratio Perm			0.00						c0.73			
v/c Ratio	0.39	0.30	0.01	0.79	0.71		0.53	0.31	0.73	0.71	0.82	
Uniform Delay, d1	33.2	33.1	32.7	19.2	18.9		33.0	21.4	0.0	30.7	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	4.2	3.6		2.7	0.1	2.9	9.7	9.2	
Delay (s)	34.5	33.9	32.7	23.4	22.5		35.7	21.6	2.9	40.4	31.8	
Level of Service	C	C	C	C	C		D	C	A	D	C	
Approach Delay (s)		34.0			22.9			7.5			33.7	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	17.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱					↰↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0					4.0	
Lane Util. Factor	1.00	0.95			0.91	0.91					0.97	1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97					1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00					1.00	1.00
Frt	1.00	1.00			0.93	0.85					1.00	0.86
Flt Protected	0.95	1.00			1.00	1.00					0.95	1.00
Satd. Flow (prot)	1770	3539			3015	1399					3433	1583
Flt Permitted	0.95	1.00			1.00	1.00					0.95	1.00
Satd. Flow (perm)	1770	3539			3015	1399					3433	1563
Volume (vph)	113	273	0	0	353	1253	0	0	0	992	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	297	0	0	384	1362	0	0	0	1078	0	263
RTOR Reduction (vph)	0	0	0	0	120	0	0	0	0	0	0	160
Lane Group Flow (vph)	123	297	0	0	629	897	0	0	0	1078	0	103
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free					custom	custom
Protected Phases	5	2			6						1	4
Permitted Phases						Free					4	4
Actuated Green, G (s)	11.8	63.1			47.8	110.0					38.4	38.4
Effective Green, g (s)	11.3	63.1			47.8	110.0					38.9	38.9
Actuated g/C Ratio	0.10	0.57			0.43	1.00					0.35	0.35
Clearance Time (s)	3.5	4.0			4.0						4.5	4.5
Vehicle Extension (s)	2.0	4.0			4.0						2.5	2.5
Lane Grp Cap (vph)	182	2030			1310	1399					1214	560
v/s Ratio Prot	0.07	0.08			0.21						c0.31	0.06
v/s Ratio Perm						c0.71						
v/c Ratio	0.68	0.15			0.48	0.74					0.89	0.18
Uniform Delay, d1	47.6	10.9			22.2	0.0					33.5	24.6
Progression Factor	1.00	1.00			0.94	1.00					1.00	1.00
Incremental Delay, d2	7.6	0.2			0.8	2.0					8.1	0.1
Delay (s)	55.2	11.1			21.7	2.0					41.6	24.7
Level of Service	E	B			C	A					D	C
Approach Delay (s)		24.0			10.5			0.0			30.3	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑			↑↑↑	↱	↰	↞	↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.86	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1450	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1450	659			
Volume (vph)	111	1154	0	0	1234	432	372	21	1128	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1254	0	0	1341	470	404	23	1226	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	300	0	162	2	0	0	0
Lane Group Flow (vph)	121	1254	0	0	1341	170	404	474	611	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.7	37.0			39.8	39.8	46.0	46.0	65.0			
Effective Green, g (s)	10.2	37.0			39.8	39.8	46.0	46.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	164	1197			1678	528	734	633	389			
v/s Ratio Prot	0.07	c0.35			c0.29		0.24	0.33	c0.93			
v/s Ratio Perm						0.12						
v/c Ratio	0.74	1.05			0.80	0.32	0.55	0.75	1.57			
Uniform Delay, d1	48.6	36.5			31.5	25.4	23.0	25.9	22.5			
Progression Factor	1.21	0.56			0.86	1.26	1.00	1.00	1.00			
Incremental Delay, d2	11.7	37.3			2.9	1.1	3.0	7.9	268.5			
Delay (s)	70.3	58.6			29.8	33.1	26.0	33.8	291.0			
Level of Service	E	E			C	C	C	C	F			
Approach Delay (s)		59.7			30.7			127.3			0.0	
Approach LOS		E			C			F			A	

Intersection Summary				
HCM Average Control Delay	71.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.42			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	75.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑	↱	↰	↑↑	↱	↰	↑	↱	↰	↰↰	↱↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.95	1.00
Satd. Flow (prot)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1823	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.95	1.00
Satd. Flow (perm)	3433	3017	1219	1770	3539	1524	1681	1719	1497		1823	2628
Volume (vph)	691	450	1141	270	442	227	227	62	101	206	270	985
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	751	489	1240	293	480	247	247	67	110	224	293	1071
RTOR Reduction (vph)	0	209	95	0	0	102	0	0	98	0	0	78
Lane Group Flow (vph)	751	900	525	293	480	145	153	161	12	0	517	993
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	46.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	960	521	274	1062	457	183	188	163		497	1266
v/s Ratio Prot	c0.22	0.30	c0.43	c0.17	0.14		0.09	0.09			c0.28	0.38
v/s Ratio Perm						0.10			0.01			
v/c Ratio	1.27	0.94	1.01	1.07	0.45	0.32	0.84	0.86	0.07		1.04	0.78
Uniform Delay, d1	45.5	36.4	31.5	46.5	31.2	29.6	48.0	48.2	44.0		40.0	23.7
Progression Factor	1.26	1.03	1.06	1.00	1.00	1.00	1.26	1.26	2.47		0.75	1.08
Incremental Delay, d2	121.2	2.3	13.7	74.0	1.4	1.8	23.7	26.6	0.1		47.7	4.1
Delay (s)	178.0	39.7	46.8	120.5	32.8	31.6	84.3	87.3	106.7		77.9	29.9
Level of Service	F	D	D	F	C	C	F	F	F		E	C
Approach Delay (s)		83.4			57.6			91.0			45.5	
Approach LOS		F			E			F			D	

Intersection Summary				
HCM Average Control Delay	68.3	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	100.4%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88	1.00		1.00		0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)	1610	3390	2787	1770		1583		3531			1863	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (perm)	1610	3390	2787	1770		1583		3531			1863	
Volume (vph)	105	218	1025	51	0	120	0	1285	21	0	322	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	237	1114	55	0	130	0	1397	23	0	350	0
RTOR Reduction (vph)	0	0	106	0	0	121	0	1	0	0	0	0
Lane Group Flow (vph)	114	237	1008	55	0	9	0	1419	0	0	350	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom	Prot		custom						
Protected Phases	4	4	4 5	3				2			6	
Permitted Phases						3						
Actuated Green, G (s)	39.8	39.8	52.1	6.2		8.2		51.5			39.2	
Effective Green, g (s)	39.3	39.3	51.6	7.7		7.7		51.0			38.7	
Actuated g/C Ratio	0.36	0.36	0.47	0.07		0.07		0.46			0.35	
Clearance Time (s)	3.5	3.5		3.5		3.5		3.5			3.5	
Vehicle Extension (s)	2.5	2.5		2.5		2.5		3.0			3.0	
Lane Grp Cap (vph)	575	1211	1307	124		111		1637			655	
v/s Ratio Prot	0.07	0.07	c0.36	c0.03				c0.40			0.19	
v/s Ratio Perm						0.01						
v/c Ratio	0.20	0.20	0.77	0.44		0.08		0.87			0.53	
Uniform Delay, d1	24.5	24.4	24.3	49.1		47.8		26.5			28.5	
Progression Factor	1.19	1.19	1.56	1.00		1.00		0.68			1.01	
Incremental Delay, d2	0.7	0.3	2.5	1.8		0.2		5.3			2.9	
Delay (s)	29.8	29.5	40.4	50.9		48.1		23.4			31.7	
Level of Service	C	C	D	D		D		C			C	
Approach Delay (s)		37.6			48.9			23.4			31.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3360		1770	3503		1770	1821		1770	1863	1542
Volume (vph)	66	465	210	37	601	35	232	150	22	35	175	89
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	505	228	40	653	38	252	163	24	38	190	97
RTOR Reduction (vph)	0	60	0	0	5	0	0	8	0	0	0	83
Lane Group Flow (vph)	72	673	0	40	686	0	252	179	0	38	190	14
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Effective Green, g (s)	2.9	24.0		1.3	22.4		10.1	10.1		8.9	8.9	8.9
Actuated g/C Ratio	0.05	0.40		0.02	0.37		0.17	0.17		0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	85	1337		38	1301		296	305		261	275	228
v/s Ratio Prot	c0.04	c0.20		0.02	0.20		c0.14	0.10		0.02	c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.50		1.05	0.53		0.85	0.59		0.15	0.69	0.06
Uniform Delay, d1	28.5	13.7		29.5	14.8		24.4	23.2		22.4	24.4	22.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	50.4	0.3		162.1	0.4		20.3	2.9		0.3	7.3	0.1
Delay (s)	78.9	14.0		191.6	15.2		44.7	26.0		22.6	31.7	22.2
Level of Service	E	B		F	B		D	C		C	C	C
Approach Delay (s)		19.8			24.9			36.7			27.8	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3463		1770	3515			1801	1555		1772	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3463		1770	3515			1801	1555		1772	
Volume (vph)	18	863	96	152	957	29	128	60	181	7	33	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	938	104	165	1040	32	139	65	197	8	36	15
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	166	0	13	0
Lane Group Flow (vph)	20	1036	0	165	1071	0	0	204	31	0	46	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	45.0		11.6	55.0			16.3	16.3		12.6	
Effective Green, g (s)	1.1	45.0		11.1	55.0			15.8	15.8		12.1	
Actuated g/C Ratio	0.01	0.45		0.11	0.55			0.16	0.16		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1558		196	1933			285	246		214	
v/s Ratio Prot	0.01	c0.30		c0.09	0.30			c0.11			c0.03	
v/s Ratio Perm									0.02			
v/c Ratio	1.05	0.66		0.84	0.55			0.72	0.13		0.21	
Uniform Delay, d1	49.4	21.6		43.6	14.6			40.0	36.2		39.7	
Progression Factor	1.06	0.43		0.82	0.85			1.00	1.00		1.00	
Incremental Delay, d2	211.3	2.0		17.0	0.7			7.7	0.2		0.4	
Delay (s)	264.0	11.2		52.7	13.2			47.7	36.3		40.0	
Level of Service	F	B		D	B			D	D		D	
Approach Delay (s)		16.0			15.9			42.1			40.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Existing Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.97	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.92		1.00	0.98			1.00	0.99		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.94		1.00	0.98			1.00	0.99		1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	3070		1770	3394			3433	3501		1770	3262
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	3070		1770	3394			3433	3501		1770	3262
Volume (vph)	166	532	335	69	430	65	480	645	25	113	664	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	578	364	75	467	71	522	701	27	123	743	200
RTOR Reduction (vph)	0	97	0	0	12	0	0	3	0	0	24	0
Lane Group Flow (vph)	180	845	0	75	526	0	522	725	0	123	919	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.1	32.3		5.2	24.4		16.6	36.7		10.8	30.0	
Effective Green, g (s)	12.6	32.3		4.7	24.4		16.0	36.7		10.3	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.37		0.10	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	223	992		83	828		549	1285		182	1017	
v/s Ratio Prot	c0.10	c0.28		0.04	0.16		c0.15	0.21		0.07	c0.28	
v/s Ratio Perm												
v/c Ratio	0.81	0.85		0.90	0.64		0.95	0.56		0.68	0.90	
Uniform Delay, d1	42.5	31.6		47.4	33.8		41.6	25.3		43.2	33.1	
Progression Factor	1.15	0.39		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.1	7.6		66.1	3.7		26.3	1.8		7.6	12.8	
Delay (s)	63.9	20.0		113.5	37.5		67.9	27.1		50.8	45.9	
Level of Service	E	B		F	D		E	C		D	D	
Approach Delay (s)		27.0			46.8			44.1			46.4	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
ALTERNATIVE #4
2010

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.96	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3390		1770	3518		1770	3424		1770	1863	1583
Flt Permitted	0.95	1.00		0.96	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3390		1770	3518		1770	3424		1770	1863	1583
Volume (vph)	514	847	332	104	742	30	121	226	63	61	222	198
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	541	892	349	109	781	32	127	238	66	64	234	208
RTOR Reduction (vph)	0	34	0	0	2	0	0	24	0	0	0	175
Lane Group Flow (vph)	541	1207	0	109	811	0	127	280	0	64	234	33
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	34.6	51.9		10.7	28.0		13.2	13.2		17.2	17.2	17.2
Effective Green, g (s)	34.6	52.9		10.7	29.0		13.2	13.2		17.2	17.2	17.2
Actuated g/C Ratio	0.31	0.48		0.10	0.26		0.12	0.12		0.16	0.16	0.16
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	557	1630		172	927		212	411		277	291	248
v/s Ratio Prot	c0.31	0.36		0.06	c0.23		0.07	c0.08		0.04	c0.13	
v/s Ratio Perm												0.02
v/c Ratio	0.97	0.74		0.63	0.87		0.60	0.68		0.23	0.80	0.13
Uniform Delay, d1	37.2	23.0		47.6	38.8		45.9	46.4		40.6	44.8	40.0
Progression Factor	1.00	1.00		0.90	1.25		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	30.8	3.1		4.7	7.4		3.8	4.2		0.4	14.8	0.2
Delay (s)	68.0	26.1		47.5	55.8		49.7	50.6		41.0	59.6	40.2
Level of Service	E	C		D	E		D	D		D	E	D
Approach Delay (s)		38.8			54.6			50.3			49.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	45.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3453			3435		1770	3485		1770	3452	
Flt Permitted	0.21	1.00			0.63		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	388	3453			2170		1770	3485		1770	3452	
Volume (vph)	122	709	137	74	551	123	194	683	75	118	780	154
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	746	144	78	580	129	204	698	79	124	821	162
RTOR Reduction (vph)	0	16	0	0	16	0	0	7	0	0	14	0
Lane Group Flow (vph)	128	874	0	0	771	0	204	770	0	124	969	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	40.7	40.7			40.7		15.2	40.3		16.0	41.1	
Effective Green, g (s)	40.7	40.7			40.7		15.2	41.3		16.0	42.1	
Actuated g/C Ratio	0.37	0.37			0.37		0.14	0.38		0.15	0.38	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	144	1278			803		245	1308		257	1321	
v/s Ratio Prot		0.25					c0.12	0.22		0.07	c0.28	
v/s Ratio Perm	0.33				c0.36							
v/c Ratio	0.89	0.68			0.96		0.83	0.59		0.48	0.73	
Uniform Delay, d1	32.5	29.2			33.8		46.2	27.5		43.2	29.1	
Progression Factor	0.44	0.49			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	33.7	1.1			22.1		20.8	1.9		1.4	3.6	
Delay (s)	48.2	15.3			56.0		67.0	29.5		44.6	32.8	
Level of Service	D	B			E		E	C		D	C	
Approach Delay (s)		19.4			56.0			37.3			34.1	
Approach LOS		B			E			D			C	

Intersection Summary			
HCM Average Control Delay	35.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	77	55	1	2	0	92	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	81	58	1	2	0	97	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					921							
pX, platoon unblocked												
vC, conflicting volume	59			5			225	225	4	322	226	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			225	225	4	322	226	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			100	100	91	100	100	100
cM capacity (veh/h)	1545			1616			701	640	1079	553	640	1007

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	140	99	1
Volume Left	0	81	2	0
Volume Right	2	1	97	0
cSH	1545	1616	1067	640
Volume to Capacity	0.00	0.05	0.09	0.00
Queue Length 95th (ft)	0	4	8	0
Control Delay (s)	0.0	4.4	8.7	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	4.4	8.7	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.89			0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1842		1770	1665			1784		1770	1802	
Flt Permitted	0.85	1.00		0.71	1.00			0.98		0.29	1.00	
Satd. Flow (perm)	1214	1842		1326	1665			1746		537	1802	
Volume (vph)	57	61	5	153	47	112	11	191	86	119	324	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	64	5	161	49	118	12	201	91	125	341	95
RTOR Reduction (vph)	0	3	0	0	65	0	0	29	0	0	21	0
Lane Group Flow (vph)	60	68	0	161	102	0	0	275	0	125	415	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	27.6	27.6		27.6	27.6			14.5		25.4	25.4	
Effective Green, g (s)	27.1	27.1		27.1	27.1			14.0		24.9	24.9	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.23		0.42	0.42	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	548	832		599	752			407		365	748	
v/s Ratio Prot		0.04			0.06					0.04	c0.23	
v/s Ratio Perm	0.05			c0.12				c0.16		0.10		
v/c Ratio	0.11	0.08		0.27	0.14			0.68		0.34	0.55	
Uniform Delay, d1	9.5	9.4		10.3	9.8			20.9		12.5	13.3	
Progression Factor	1.00	1.00		0.81	0.63			1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		1.1	0.4			4.4		0.6	0.9	
Delay (s)	9.9	9.5		9.4	6.4			25.3		13.1	14.2	
Level of Service	A	A		A	A			C		B	B	
Approach Delay (s)		9.7			7.0			25.3			14.0	
Approach LOS		A			A			C			B	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	1856		1770	1863	1751	
Flt Permitted	1.00		0.59	1.00	0.95	
Satd. Flow (perm)	1856		1094	1863	1751	
Volume (vph)	259	8	25	253	59	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	8	26	266	62	11
RTOR Reduction (vph)	1	0	0	0	10	0
Lane Group Flow (vph)	280	0	26	266	63	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	48.0		48.0	48.0	5.0	
Effective Green, g (s)	47.5		47.5	47.5	4.5	
Actuated g/C Ratio	0.79		0.79	0.79	0.08	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1469		866	1475	131	
v/s Ratio Prot	c0.15			0.14	c0.04	
v/s Ratio Perm			0.02			
v/c Ratio	0.19		0.03	0.18	0.48	
Uniform Delay, d1	1.5		1.3	1.5	26.6	
Progression Factor	0.82		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.1	0.3	2.8	
Delay (s)	1.7		1.4	1.8	29.4	
Level of Service	A		A	A	C	
Approach Delay (s)	1.7			1.8	29.4	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	4.8	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1834		1770	1850		1770	1807	
Flt Permitted		0.69			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1551			1510		1770	1850		1770	1807	
Volume (vph)	72	92	132	37	112	4	36	293	14	23	443	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	76	97	139	39	118	4	38	308	15	24	466	115
RTOR Reduction (vph)	0	59	0	0	2	0	0	3	0	0	15	0
Lane Group Flow (vph)	0	254	0	0	159	0	38	320	0	24	566	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			4		5	2		1	6	
Permitted Phases	6			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		310			302		85	1003		32	925	
v/s Ratio Prot							c0.02	0.17		0.01	c0.31	
v/s Ratio Perm		c0.16			0.11							
v/c Ratio		0.82			0.53		0.45	0.32		0.75	0.61	
Uniform Delay, d1		19.1			17.9		23.2	6.3		24.4	8.7	
Progression Factor		1.00			1.00		0.88	1.15		1.00	1.00	
Incremental Delay, d2		15.5			1.3		2.7	0.8		62.8	3.0	
Delay (s)		34.7			19.2		23.0	8.2		87.2	11.7	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		34.7			19.2			9.7			14.7	
Approach LOS		C			B			A			B	

Intersection Summary				
HCM Average Control Delay	18.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	61	12	4	22	91	63	0	78	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	54	13	4	23	96	66	0	82	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	71	185	87
Volume Left (vph)	2	54	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.16	0.00
Departure Headway (s)	4.3	4.7	4.0	4.3
Degree Utilization, x	0.01	0.09	0.21	0.10
Capacity (veh/h)	770	722	867	816
Control Delay (s)	7.3	8.1	8.1	7.8
Approach Delay (s)	7.3	8.1	8.1	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.0			
HCM Level of Service	A			
Intersection Capacity Utilization	33.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	68	22	29	238	406	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	72	23	31	251	427	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	779	466	508			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	439	481			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	96	97			
cM capacity (veh/h)	340	566	1025			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	95	31	251	508
Volume Left	72	31	0	0
Volume Right	23	0	0	81
cSH	379	1025	1700	1700
Volume to Capacity	0.25	0.03	0.15	0.30
Queue Length 95th (ft)	24	2	0	0
Control Delay (s)	17.6	8.6	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.6	0.9		0.0
Approach LOS	C			

Intersection Summary				
Average Delay		2.2		
Intersection Capacity Utilization	37.8%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.86	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1664		1770	3539	1583		3521	
Flt Permitted		0.97	1.00	0.95	0.96		0.50	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1664		926	3539	1583		3289	
Volume (vph)	39	28	117	438	4	29	59	383	387	17	379	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	461	4	31	62	403	407	18	399	9
RTOR Reduction (vph)	0	0	116	0	5	0	0	0	138	0	1	0
Lane Group Flow (vph)	0	70	7	257	234	0	62	403	269	0	425	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	16.0	16.0		66.6	66.6	66.6		66.6	
Effective Green, g (s)		5.9	5.9	16.0	16.0		66.1	66.1	66.1		66.1	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	269	266		612	2339	1046		2174	
v/s Ratio Prot		c0.04		c0.15	0.14			0.11				
v/s Ratio Perm			0.00				0.07		c0.17		0.13	
v/c Ratio		0.65	0.08	0.96	0.88		0.10	0.17	0.26		0.20	
Uniform Delay, d1		46.1	44.5	41.6	41.1		6.2	6.5	6.9		6.6	
Progression Factor		1.00	1.00	1.34	1.34		0.04	0.05	2.94		1.00	
Incremental Delay, d2		12.1	0.3	41.1	25.3		0.1	0.1	0.3		0.2	
Delay (s)		58.2	44.7	96.8	80.5		0.4	0.4	20.6		6.8	
Level of Service		E	D	F	F		A	A	C		A	
Approach Delay (s)		49.6		88.9			9.0				6.8	
Approach LOS		D		F			A				A	

Intersection Summary				
HCM Average Control Delay	32.8	HCM Level of Service		C
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	51.6%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	344	43	253	276	94	286
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	362	45	266	291	99	280
RTOR Reduction (vph)	0	29	0	0	0	221
Lane Group Flow (vph)	362	16	266	291	99	59
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	21.5	36.2	11.2	71.5	56.8	21.5
Effective Green, g (s)	21.0	35.7	10.7	71.0	56.3	21.0
Actuated g/C Ratio	0.21	0.36	0.11	0.71	0.56	0.21
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	372	565	367	1323	1049	332
v/s Ratio Prot	c0.20	0.01	c0.08	c0.16	0.05	0.04
v/s Ratio Perm						
v/c Ratio	0.97	0.03	0.72	0.22	0.09	0.18
Uniform Delay, d1	39.2	20.9	43.2	5.0	10.1	32.4
Progression Factor	1.11	3.35	0.82	0.36	1.00	1.00
Incremental Delay, d2	38.2	0.0	6.8	0.4	0.2	0.3
Delay (s)	81.8	69.9	42.5	2.2	10.3	32.7
Level of Service	F	E	D	A	B	C
Approach Delay (s)	80.5			21.4	26.8	
Approach LOS	F			C	C	

Intersection Summary				
HCM Average Control Delay	40.9	HCM Level of Service		D
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization	40.3%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.85	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1700		1770	3539	1583	1770	1800	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1700		1770	3539	1583	1770	1800	
Volume (vph)	5	21	16	796	79	0	88	88	932	76	248	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	838	83	0	93	93	981	80	261	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	5	22	1	448	473	0	93	93	981	80	325	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	27.0	27.0		6.6	19.0	69.4	4.8	17.2	
Effective Green, g (s)	2.6	2.6	2.6	27.0	27.0		6.1	19.5	69.4	4.3	17.7	
Actuated g/C Ratio	0.04	0.04	0.04	0.39	0.39		0.09	0.28	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	68	70	59	654	661		156	994	1583	110	459	
v/s Ratio Prot	0.00	0.01		0.27	c0.28		0.05	0.03		0.05	0.18	
v/s Ratio Perm			0.00						c0.62			
v/c Ratio	0.08	0.31	0.01	0.69	0.72		0.60	0.09	0.62	0.73	0.71	
Uniform Delay, d1	32.2	32.5	32.2	17.7	17.9		30.5	18.4	0.0	32.0	23.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.9	0.0	2.7	3.4		4.0	0.0	1.8	18.2	4.6	
Delay (s)	32.4	33.5	32.2	20.4	21.4		34.6	18.5	1.8	50.2	28.1	
Level of Service	C	C	C	C	C		C	B	A	D	C	
Approach Delay (s)		32.9			20.9			5.8			32.3	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	16.0	HCM Level of Service		B
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	69.4	Sum of lost time (s)		4.0
Intersection Capacity Utilization	63.0%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frt	1.00	0.93			0.99	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3291			3364	1441				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3291			3364	1441				3433		1583
Volume (vph)	119	216	190	0	691	1100	0	0	0	917	0	129
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	227	200	0	727	1158	0	0	0	965	0	136
RTOR Reduction (vph)	0	81	0	0	3	0	0	0	0	0	0	92
Lane Group Flow (vph)	125	346	0	0	724	1319	0	0	0	965	0	44
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.6	59.4			36.4	100.0				32.1		32.1
Effective Green, g (s)	19.0	59.4			36.4	100.0				32.6		32.6
Actuated g/C Ratio	0.19	0.59			0.36	1.00				0.33		0.33
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	1955			1224	1441				1119		516
v/s Ratio Prot	0.07	0.11			0.23					0.28		
v/s Ratio Perm						c0.78						0.03
v/c Ratio	0.37	0.18			0.62	0.78				0.86		0.09
Uniform Delay, d1	35.3	9.2			26.2	0.0				31.8		23.4
Progression Factor	1.00	1.00			0.67	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			1.1	1.9				7.0		0.1
Delay (s)	35.6	9.4			18.6	1.9				38.6		23.4
Level of Service	D	A			B	A				D		C
Approach Delay (s)		15.3			6.7			0.0		36.7		
Approach LOS		B			A			A		D		

Intersection Summary				
HCM Average Control Delay	18.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1451	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1451	1504			
Volume (vph)	74	1058	0	0	1180	353	611	2	1287	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1114	0	0	1242	372	643	2	1355	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	253	0	70	25	0	0	0
Lane Group Flow (vph)	78	1114	0	0	1242	119	605	687	0	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4+1			
Permitted Phases						6						
Actuated Green, G (s)	16.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	16.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.16	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	551	677			
v/s Ratio Prot	0.04	c0.22			c0.27		0.36	c0.44	c0.44			
v/s Ratio Perm						0.08						
v/c Ratio	0.24	0.47			0.84	0.23	0.95	1.25	0.99			
Uniform Delay, d1	35.2	18.0			31.6	25.0	30.0	31.0	27.2			
Progression Factor	0.79	0.44			0.53	0.33	1.00	1.00	1.00			
Incremental Delay, d2	1.4	0.5			4.4	0.8	23.3	86.5	30.8			
Delay (s)	29.3	8.5			21.0	9.0	53.3	117.5	57.9			
Level of Service	C	A			C	A	D	F	E			
Approach Delay (s)		9.8			18.3			77.5			0.0	
Approach LOS		A			B			E			A	

Intersection Summary				
HCM Average Control Delay	40.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1790	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1695	1583		1790	2628
Volume (vph)	669	1306	370	75	743	170	42	3	42	200	45	754
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	704	1375	389	79	782	179	44	3	44	211	47	794
RTOR Reduction (vph)	0	0	188	0	0	34	0	0	41	0	0	193
Lane Group Flow (vph)	704	1375	201	79	782	145	23	24	3	0	258	601
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.6	41.3	52.2	6.8	26.5	26.5	7.4	7.4	7.4		30.5	51.1
Effective Green, g (s)	20.1	40.8	51.7	6.3	27.0	27.0	6.9	6.9	6.9		30.0	50.1
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	690	1383	745	112	956	427	116	117	109		537	1317
v/s Ratio Prot	0.21	c0.41	c0.14	0.04	c0.22		0.01	0.01			c0.14	0.23
v/s Ratio Perm						0.09			0.00			
v/c Ratio	1.02	0.99	0.27	0.71	0.82	0.34	0.20	0.21	0.03		0.48	0.46
Uniform Delay, d1	39.9	29.5	13.6	45.9	34.2	29.3	43.9	44.0	43.4		28.6	16.1
Progression Factor	1.12	0.65	0.51	1.00	1.00	1.00	1.00	1.00	1.00		1.26	1.19
Incremental Delay, d2	31.5	17.2	0.1	15.2	7.7	2.1	0.6	0.6	0.1		2.6	1.0
Delay (s)	76.3	36.4	7.0	61.1	41.9	31.5	44.6	44.6	43.5		38.7	20.2
Level of Service	E	D	A	E	D	C	D	D	D		D	C
Approach Delay (s)		43.1			41.6			44.1			24.7	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3531			1863	
Flt Permitted	0.95	0.98	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3531			1863	
Volume (vph)	55	29	257	0	0	0	0	534	0	0	142	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	31	271	0	0	0	0	562	0	0	149	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	98	0	0	0	0	570	0	0	149	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.6					65.0			56.4	
Effective Green, g (s)	27.5	27.5	36.1					64.5			55.9	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1006					2277			1041	
v/s Ratio Prot	0.02	0.02	c0.04					c0.16			0.08	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.10					0.25			0.14	
Uniform Delay, d1	26.8	26.8	21.2					7.5			10.6	
Progression Factor	0.96	0.96	0.82					1.00			0.91	
Incremental Delay, d2	0.3	0.1	0.0					0.3			0.3	
Delay (s)	26.0	25.8	17.4					7.8			10.0	
Level of Service	C	C	B					A			A	
Approach Delay (s)		19.6			0.0			7.8			10.0	
Approach LOS		B			A			A			A	

Intersection Summary				
HCM Average Control Delay	12.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	25.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3336		1770	3483		1770	1832		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3336		1770	3483		1770	1832		1770	1863	1583
Volume (vph)	393	459	284	36	510	61	297	210	26	28	201	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	414	483	299	38	537	64	313	221	27	29	212	108
RTOR Reduction (vph)	0	80	0	0	9	0	0	5	0	0	0	91
Lane Group Flow (vph)	414	702	0	38	592	0	313	243	0	29	212	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	24.9	41.7		5.7	22.5		21.6	21.6		16.0	16.0	16.0
Effective Green, g (s)	24.4	42.2		6.2	23.0		21.1	21.1		15.5	15.5	15.5
Actuated g/C Ratio	0.24	0.42		0.06	0.23		0.21	0.21		0.16	0.16	0.16
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	432	1406		92	801		373	387		274	289	245
v/s Ratio Prot	c0.23	0.21		0.02	c0.17		c0.18	0.13		0.02	c0.11	
v/s Ratio Perm												0.01
v/c Ratio	0.96	0.50		0.41	0.74		0.84	0.63		0.11	0.73	0.07
Uniform Delay, d1	37.3	21.2		45.9	35.7		37.8	35.9		36.3	40.3	36.1
Progression Factor	1.00	1.00		1.00	1.00		0.98	0.98		0.81	0.85	1.22
Incremental Delay, d2	32.4	1.3		3.0	6.0		15.1	3.2		0.2	9.0	0.1
Delay (s)	69.6	22.4		48.9	41.8		52.4	38.3		29.6	43.2	45.8
Level of Service	E	C		D	D		D	D		C	D	D
Approach Delay (s)		38.8			42.2			46.2			42.9	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	41.6	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.83				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3378		1770	3515		1770	3487		1770	3497	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3378		1770	3515		1770	3487		1770	3497	
Volume (vph)	94	277	121	100	452	22	127	543	59	49	763	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	292	127	105	476	23	134	572	62	52	803	69
RTOR Reduction (vph)	0	53	0	0	4	0	0	6	0	0	5	0
Lane Group Flow (vph)	99	366	0	105	495	0	134	628	0	52	867	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.9	18.5		9.3	19.9		12.6	50.0		7.2	44.6	
Effective Green, g (s)	6.9	19.0		8.3	20.4		11.6	50.5		6.2	45.1	
Actuated g/C Ratio	0.07	0.19		0.08	0.20		0.12	0.50		0.06	0.45	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	642		147	717		205	1761		110	1577	
v/s Ratio Prot	0.06	0.11		c0.06	c0.14		c0.08	0.18		0.03	c0.25	
v/s Ratio Perm												
v/c Ratio	0.81	0.57		0.71	0.69		0.65	0.36		0.47	0.55	
Uniform Delay, d1	46.9	36.8		44.7	36.8		42.3	14.9		45.3	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.2		16.2	2.9		7.3	0.6		3.2	1.4	
Delay (s)	78.0	38.0		59.9	39.7		49.6	15.5		48.5	21.4	
Level of Service	E	D		E	D		D	B		D	C	
Approach Delay (s)		45.7			43.2			21.4			22.9	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	31.1	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.80				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1770	3416		1770	3539	1583	1770	1817			1810	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (perm)	1770	3416		1770	3539	1583	1770	1817			1810	
Volume (vph)	24	276	84	43	359	177	110	157	30	25	50	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	291	88	45	378	186	116	165	32	26	53	9
RTOR Reduction (vph)	0	18	0	0	0	85	0	9	0	0	5	0
Lane Group Flow (vph)	25	361	0	45	378	101	116	188	0	0	83	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	52.0		5.3	54.2	54.2	14.7	14.7			13.5	
Effective Green, g (s)	2.6	52.0		4.8	54.2	54.2	14.2	14.2			13.0	
Actuated g/C Ratio	0.03	0.52		0.05	0.54	0.54	0.14	0.14			0.13	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1776		85	1918	858	251	258			235	
v/s Ratio Prot	0.01	0.11		c0.03	c0.11		0.07	c0.10			c0.05	
v/s Ratio Perm						0.06						
v/c Ratio	0.54	0.20		0.53	0.20	0.12	0.46	0.73			0.35	
Uniform Delay, d1	48.1	12.9		46.5	11.7	11.2	39.4	41.1			39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	10.0	0.3		4.5	0.2	0.3	1.0	9.6			0.7	
Delay (s)	58.1	13.1		51.0	12.0	11.5	40.4	50.7			40.3	
Level of Service	E	B		D	B	B	D	D			D	
Approach Delay (s)		15.9			14.7			46.8			40.3	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	23.8	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.32				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3436		1770	3539	1583	1770	1863	1583	1770	1848	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3436		1770	3539	1583	1770	1863	1583	1770	1848	
Volume (vph)	28	258	63	52	527	221	143	263	39	134	188	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	272	66	55	555	233	151	277	41	141	198	11
RTOR Reduction (vph)	0	17	0	0	0	120	0	0	31	0	2	0
Lane Group Flow (vph)	29	321	0	55	555	113	151	277	10	141	207	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	46.1		7.0	48.6	48.6	12.6	23.9	23.9	8.5	19.8	
Effective Green, g (s)	4.0	46.1		6.5	48.6	48.6	12.1	23.4	23.4	8.0	19.3	
Actuated g/C Ratio	0.04	0.46		0.06	0.49	0.49	0.12	0.23	0.23	0.08	0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1584		115	1720	769	214	436	370	142	357	
v/s Ratio Prot	0.02	0.09		c0.03	c0.16		c0.09	c0.15		c0.08	0.11	
v/s Ratio Perm						0.07			0.01			
v/c Ratio	0.41	0.20		0.48	0.32	0.15	0.71	0.64	0.03	0.99	0.58	
Uniform Delay, d1	46.8	16.0		45.1	15.7	14.2	42.2	34.5	29.5	46.0	36.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.83	
Incremental Delay, d2	2.8	0.3		2.3	0.5	0.4	9.4	2.6	0.0	71.9	1.8	
Delay (s)	49.6	16.3		47.4	16.2	14.6	51.6	37.1	29.5	119.6	32.1	
Level of Service	D	B		D	B	B	D	D	C	F	C	
Approach Delay (s)		18.9			17.6			41.1			67.4	
Approach LOS		B			B			D			E	

Intersection Summary					
HCM Average Control Delay	31.9	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	389	16	90	780	21	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	409	17	95	821	22	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			328							
pX, platoon unblocked												
vC, conflicting volume	843			426			1071	1501	213	1362	1498	422
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	843			426			1071	1501	213	1362	1498	422
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			82	87	90	97	97	100
cM capacity (veh/h)	789			1129			160	107	792	60	108	581

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	25	273	153	95	547	296	34	65	6
Volume Left	25	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	22	0	78	1
cSH	789	1700	1700	1129	1700	1700	143	522	110
Volume to Capacity	0.03	0.16	0.09	0.08	0.32	0.17	0.24	0.16	0.06
Queue Length 95th (ft)	2	0	0	7	0	0	22	14	5
Control Delay (s)	9.7	0.0	0.0	8.5	0.0	0.0	37.9	13.2	39.9
Lane LOS	A			A			E	B	E
Approach Delay (s)	0.5			0.9			20.3		39.9
Approach LOS							C		E

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	39.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3473		1770	3500			1805	1583		1810	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.64	
Satd. Flow (perm)	1770	3473		1770	3500			1805	1583		1545	
Volume (vph)	3	400	57	122	681	53	150	85	121	10	22	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	421	60	128	686	56	158	89	127	11	23	4
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	105	0	4	0
Lane Group Flow (vph)	3	473	0	128	740	0	0	247	22	0	34	0
Turn Type	Prot			Prot			Split			Perm	Perm	
Protected Phases	1	6		5	2		7	7			8	
Permitted Phases										7		
Actuated Green, G (s)	0.9	49.0		11.3	59.4			17.7	17.7		7.5	
Effective Green, g (s)	0.4	49.0		10.8	59.4			17.2	17.2		7.0	
Actuated g/C Ratio	0.00	0.48		0.11	0.59			0.17	0.17		0.07	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1702		191	2079			310	272		108	
v/s Ratio Prot	0.00	c0.14		c0.07	c0.21			c0.14				
v/s Ratio Perm									0.01		c0.02	
v/c Ratio	0.43	0.28		0.67	0.36			0.80	0.08		0.32	
Uniform Delay, d1	49.7	15.1		42.9	10.5			39.7	34.8		44.2	
Progression Factor	1.00	1.00		1.14	0.69			1.00	1.00		1.00	
Incremental Delay, d2	27.8	0.4		5.1	0.3			12.9	0.1		1.2	
Delay (s)	77.5	15.5		54.2	7.6			52.6	34.9		45.5	
Level of Service	E	B		D	A			D	C		D	
Approach Delay (s)		15.8			14.3			46.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM Average Control Delay	22.2	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	52.7%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3360		1770	3390		3433	3534		1770	3508	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3360		1770	3390		3433	3534		1770	3508	
Volume (vph)	92	290	147	32	457	179	319	785	6	160	871	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	305	155	34	481	188	336	826	6	168	917	57
RTOR Reduction (vph)	0	71	0	0	41	0	0	1	0	0	4	0
Lane Group Flow (vph)	97	389	0	34	628	0	336	831	0	168	970	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.5	22.4		8.7	22.6		15.0	42.6		13.3	40.9	
Effective Green, g (s)	7.5	21.4		7.7	21.6		14.0	42.6		12.3	40.9	
Actuated g/C Ratio	0.08	0.21		0.08	0.22		0.14	0.43		0.12	0.41	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	133	719		136	732		481	1505		218	1435	
v/s Ratio Prot	c0.05	0.12		0.02	c0.19		c0.10	0.24		c0.09	c0.28	
v/s Ratio Perm												
v/c Ratio	0.73	0.54		0.25	0.86		0.70	0.55		0.77	0.68	
Uniform Delay, d1	45.3	34.9		43.4	37.7		41.0	21.6		42.5	24.1	
Progression Factor	1.32	1.03		1.12	1.08		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.6		0.3	9.1		3.6	1.5		14.2	2.6	
Delay (s)	74.7	36.7		48.8	49.1		44.6	23.0		56.6	26.7	
Level of Service	E	D		D	D		D	C		E	C	
Approach Delay (s)		43.3			49.1			29.2			31.1	
Approach LOS		D			D			C			C	

Intersection Summary					
HCM Average Control Delay	35.9	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.85	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3502		1770	3497			3410			3419	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.84	
Satd. Flow (perm)	1770	3502		1770	3497			3172			2914	
Volume (vph)	50	390	29	78	578	50	10	165	52	68	243	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	406	31	82	608	53	11	174	55	72	256	66
RTOR Reduction (vph)	0	10	0	0	11	0	0	45	0	0	34	0
Lane Group Flow (vph)	53	427	0	82	648	0	0	185	0	0	360	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.8	25.9		3.9	27.0			9.2			9.2	
Effective Green, g (s)	2.3	25.9		3.4	27.0			8.7			8.7	
Actuated g/C Ratio	0.05	0.52		0.07	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	81	1814		120	1888			552			507	
v/s Ratio Prot	0.03	0.12		c0.05	c0.19							
v/s Ratio Perm								0.06			c0.12	
v/c Ratio	0.65	0.24		0.68	0.34			0.35			0.71	
Uniform Delay, d1	23.5	6.6		22.8	6.5			18.2			19.5	
Progression Factor	0.72	1.29		1.00	1.00			1.00			1.00	
Incremental Delay, d2	12.2	0.3		12.1	0.5			0.4			4.7	
Delay (s)	29.1	8.8		34.8	7.0			18.6			24.1	
Level of Service	C	A		C	A			B			C	
Approach Delay (s)		11.0			10.1			18.6			24.1	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	14.4	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	51.4%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis — Marketplace Redevelopment
1024: Mandela Pkwy & Horton St — 2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↰			↰			↰	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	266	57	2	8	78	26	2	1	2	16	4	147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	280	60	2	8	82	27	2	1	2	17	4	155
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	280	62	118	5	176							
Volume Left (vph)	280	0	8	2	17							
Volume Right (vph)	0	2	27	2	155							
Hadj (s)	0.53	0.01	0.09	-0.13	-0.47							
Departure Headway (s)	5.6	5.1	4.8	5.2	4.6							
Degree Utilization, x	0.43	0.09	0.16	0.01	0.22							
Capacity (veh/h)	622	687	711	621	724							
Control Delay (s)	11.0	7.3	8.7	8.2	8.9							
Approach Delay (s)	10.8		8.7	8.2	8.9							
Approach LOS	B		A	A	A							
Intersection Summary												
Delay			9.9									
HCM Level of Service			A									
Intersection Capacity Utilization			36.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1025: W. MacArthur Blvd & Emery St — 2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↳			↰	↱		↰			↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.89			1.00	0.85		0.97			0.96	
Flt Protected	0.95	1.00			0.96	1.00		1.00			1.00	
Satd. Flow (prot)	1770	1664			1789	1583		1811			1785	
Flt Permitted	0.95	1.00			0.96	1.00		0.99			0.99	
Satd. Flow (perm)	1770	1664			1789	1583		1790			1759	
Volume (vph)	122	26	63	133	28	18	16	312	77	10	166	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.95	0.95
Adj. Flow (vph)	128	27	66	140	29	19	17	325	81	11	175	78
RTOR Reduction (vph)	0	57	0	0	0	16	0	7	0	0	13	0
Lane Group Flow (vph)	128	36	0	0	169	3	0	419	0	0	251	0
Turn Type	Split				Split		Perm	Perm			Perm	
Protected Phases	3	3			4	4		6			2	
Permitted Phases							4					
Actuated Green, G (s)	9.1	9.1			10.2	10.2		28.3			28.3	
Effective Green, g (s)	8.1	8.1			9.2	9.2		27.3			27.3	
Actuated g/C Ratio	0.14	0.14			0.16	0.16		0.48			0.48	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	253	238			291	257		863			848	
v/s Ratio Prot	c0.07	0.02			c0.09							
v/s Ratio Perm						0.00		c0.23			0.14	
v/c Ratio	0.51	0.15			0.58	0.01		0.49			0.30	
Uniform Delay, d1	22.4	21.2			21.9	19.9		9.9			8.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.6	0.1			1.9	0.0		0.2			0.1	
Delay (s)	23.0	21.4			23.8	19.9		10.1			8.9	
Level of Service	C	C			C	B		B			A	
Approach Delay (s)		22.3			23.4			10.1			8.9	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM Average Control Delay			14.5		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			56.6		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			49.6%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1026: Adeline St & San Pablo Avenue — 2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑			↰↑			↰↑			↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3475			3462			3504			3490	
Flt Permitted		0.77			0.99			1.00			1.00	
Satd. Flow (perm)		2702			3462			3504			3490	
Volume (vph)	60	193	12	111	258	20	0	1026	72	0	957	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	203	13	117	269	21	0	1080	76	0	1007	102
RTOR Reduction (vph)	0	3	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	276	0	0	403	0	0	1152	0	0	1102	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.0			15.6			60.4			60.4	
Effective Green, g (s)		14.0			16.6			62.4			62.4	
Actuated g/C Ratio		0.13			0.16			0.59			0.59	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		360			547			2082			2074	
v/s Ratio Prot					c0.12			c0.33			0.32	
v/s Ratio Perm		c0.10										
v/c Ratio		0.77			0.74			0.55			0.53	
Uniform Delay, d1		43.9			42.1			12.9			12.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.5			4.4			1.1			1.0	
Delay (s)		52.4			46.5			13.9			13.8	
Level of Service		D			D			B			B	
Approach Delay (s)		52.4			46.5			13.9			13.8	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay			21.9		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			69.1%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis — Marketplace Redevelopment
1027: 36th St & San Pablo Avenue — 2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱		↰↑			↰↑↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					3518	1583		3535			5076	
Flt Permitted					0.89	1.00		0.92			1.00	
Satd. Flow (perm)					3518	1583		3263			5076	
Volume (vph)	0	0	0	65	461	718	12	531	0	0	1001	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	485	756	13	559	0	0	1054	13
RTOR Reduction (vph)	0	0	0	0	0	183	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	553	573	0	572	0	0	1066	0
Turn Type				Split			Perm	Perm				
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1302	586		1795			2792	
v/s Ratio Prot					0.16						c0.21	
v/s Ratio Perm						c0.36		0.18				
v/c Ratio					0.42	0.98		0.32			0.38	
Uniform Delay, d1					23.5	31.1		12.3			12.8	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	31.0		0.5			0.4	
Delay (s)					23.6	62.1		12.7			13.2	
Level of Service					C	E		B			B	
Approach Delay (s)		0.0			45.8			12.7			13.2	
Approach LOS		A			D			B			B	
Intersection Summary												
HCM Average Control Delay			27.6		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			66.2%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.98						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3477						3490		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3477						3490		3433	3539	
Volume (vph)	16	376	47	0	0	0	0	525	54	434	600	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	396	49	0	0	0	0	553	57	457	632	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	444	0	0	0	0	0	602	0	457	632	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		12.3						31.2		11.5	46.7	
Effective Green, g (s)		13.3						32.2		12.5	46.7	
Actuated g/C Ratio		0.19						0.46		0.18	0.70	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						2.0		2.0	2.0	
Lane Grp Cap (vph)		661						1605		613	2462	
v/s Ratio Prot		c0.13						c0.17		c0.13	0.18	
v/s Ratio Perm												
v/c Ratio		0.67						0.38		0.75	0.26	
Uniform Delay, d1		26.3						12.3		27.2	3.9	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.1						0.7		4.3	0.0	
Delay (s)		28.4						13.0		31.6	4.0	
Level of Service		C						B		C	A	
Approach Delay (s)		28.4			0.0			13.0			15.5	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			1.00			1.00	
Flt Protected		0.95			0.95			0.95			0.95	
Satd. Flow (prot)		1770			1770			1770			1770	
Flt Permitted		0.95			0.95			0.95			0.95	
Satd. Flow (perm)		1770			1770			1770			1770	
Volume (vph)	290	760	212	139	862	64	194	459	129	139	316	484
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	800	223	146	907	67	204	483	136	146	333	509
RTOR Reduction (vph)	0	22	0	0	5	0	0	24	0	0	0	302
Lane Group Flow (vph)	305	1001	0	146	969	0	204	595	0	146	333	207
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.1	39.1		12.6	30.6		20.0	20.0		21.3	21.3	21.3
Effective Green, g (s)	21.1	40.1		12.6	31.6		20.0	20.0		21.3	21.3	21.3
Actuated g/C Ratio	0.18	0.36		0.11	0.29		0.18	0.18		0.19	0.19	0.19
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	340	1248		203	1006		322	622		343	381	307
v/s Ratio Prot	c0.17	0.29		0.08	c0.28		0.12	c0.17		0.08	c0.18	
v/s Ratio Perm												0.13
v/c Ratio	0.90	0.80		0.72	0.96		0.63	0.96		0.43	0.92	0.68
Uniform Delay, d1	43.4	31.4		47.0	38.6		41.6	44.6		39.0	43.5	41.1
Progression Factor	1.00	1.00		1.19	0.95		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	24.8	5.5		3.4	8.5		2.7	21.2		0.9	28.5	5.8
Delay (s)	68.2	36.9		59.1	45.2		44.5	66.5		39.8	72.0	46.9
Level of Service	E	D		E	D		D	E		D	E	D
Approach Delay (s)		44.1			47.0			61.0			54.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	50.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑			↕		↰	↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385			3437		1770	3488		1770	3450	
Flt Permitted	0.19	1.00			0.69		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	346	3385			2380		1770	3488		1770	3450	
Volume (vph)	198	635	260	67	865	148	270	1111	120	186	999	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	668	274	71	700	156	284	1169	126	196	1052	213
RTOR Reduction (vph)	0	41	0	0	15	0	0	8	0	0	15	0
Lane Group Flow (vph)	208	901	0	0	912	0	284	1286	0	196	1250	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	151	1477			1039		274	1110		241	1035	
v/s Ratio Prot		0.27					0.16	c0.37		0.11	c0.36	
v/s Ratio Perm	c0.60				0.38							
v/c Ratio	1.38	0.61			0.88		1.04	1.16		0.81	1.21	
Uniform Delay, d1	31.0	23.8			28.3		46.5	37.5		46.1	38.5	
Progression Factor	1.10	1.10			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	185.2	0.5			8.5		64.2	82.3		18.5	102.5	
Delay (s)	229.3	26.7			36.8		110.7	119.8		64.7	141.0	
Level of Service	F	C			D		F	F		E	F	
Approach Delay (s)		63.4			36.8			116.1			130.5	
Approach LOS		E			D			F			F	

Intersection Summary			
HCM Average Control Delay	94.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	143	17	0	2	1	199	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	151	18	0	2	1	209	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	16			20			342	341	20	551	341	16
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18			20			342	341	20	551	341	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	80	100	100	100
cM capacity (veh/h)	1599			1596			567	526	1058	330	526	1061
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	21	168	213	2								
Volume Left	1	151	2	1								
Volume Right	0	0	209	0								
cSH	1599	1596	1044	406								
Volume to Capacity	0.00	0.09	0.20	0.01								
Queue Length 95th (ft)	0	8	19	0								
Control Delay (s)	0.4	6.8	9.3	13.9								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.4	6.8	9.3	13.9								
Approach LOS			A	B								

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		↟			↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.99		1.00	0.90		0.95			1.00	0.97
Flt Protected		0.95	1.00		0.95	1.00		1.00			0.95	1.00
Satd. Flow (prot)		1770	1844		1770	1672		1766			1770	1814
Flt Permitted		0.35	1.00		0.70	1.00		0.99			0.24	1.00
Satd. Flow (perm)		650	1844		1303	1672		1758			438	1814
Volume (vph)	159	79	6	205	106	227	10	502	316	69	309	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	167	83	6	216	112	239	11	528	333	94	325	69
RTOR Reduction (vph)	0	4	0	0	126	0	0	37	0	0	13	0
Lane Group Flow (vph)	167	85	0	216	225	0	0	835	0	94	381	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.8	17.8		17.8	17.8			28.0		35.2	35.2	
Effective Green, g (s)	17.3	17.3		17.3	17.3			27.5		34.7	34.7	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.46		0.58	0.58	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	187	532		376	482			806		324	1049	
v/s Ratio Prot		0.05			0.13					0.02	c0.21	
v/s Ratio Perm	c0.26			0.17				c0.48		0.15		
v/c Ratio	0.89	0.16		0.57	0.47			1.04		0.29	0.36	
Uniform Delay, d1	20.5	15.9		18.2	17.6			16.3		15.8	6.8	
Progression Factor	1.00	1.00		1.20	1.44			1.00		1.00	1.00	
Incremental Delay, d2	42.6	0.6		6.1	3.1			41.4		0.5	0.2	
Delay (s)	63.1	16.6		27.9	28.4			57.7		16.3	7.0	
Level of Service	E	B		C	C			E		B	A	
Approach Delay (s)		46.9			28.2			57.7			8.8	
Approach LOS		D			C			E			A	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱		↰	↑	↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1854		1770	1863	1751	
Flt Permitted	1.00		0.45	1.00	0.96	
Satd. Flow (perm)	1854		835	1863	1751	
Volume (vph)	468	16	33	425	114	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	493	17	35	447	120	21
RTOR Reduction (vph)	1	0	0	0	16	0
Lane Group Flow (vph)	509	0	35	447	125	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	44.0		44.0	44.0	9.0	
Effective Green, g (s)	43.5		43.5	43.5	8.5	
Actuated g/C Ratio	0.72		0.72	0.72	0.14	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1344		605	1351	248	
v/s Ratio Prot	c0.27			0.24	c0.07	
v/s Ratio Perm			0.04			
v/c Ratio	0.38		0.06	0.33	0.50	
Uniform Delay, d1	3.1		2.4	3.0	23.8	
Progression Factor	0.28		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.2	0.7	1.6	
Delay (s)	1.1		2.6	3.8	25.4	
Level of Service	A		A	A	C	
Approach Delay (s)	1.1			3.8	25.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	5.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟		↰	↱		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779			1611		1770	1842		1770	1739	
Flt Permitted		0.78			0.86		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1410			1551		1770	1842		1770	1739	
Volume (vph)	202	255	68	36	137	20	183	657	44	19	354	200
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	268	72	38	144	21	172	692	46	20	373	211
RTOR Reduction (vph)	0	10	0	0	8	0	0	4	0	0	37	0
Lane Group Flow (vph)	0	543	0	0	195	0	172	734	0	20	547	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.6		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		410			460		222	874		29	636	
v/s Ratio Prot		c0.39			0.12		c0.10	c0.40		0.01	0.31	
v/s Ratio Perm												
v/c Ratio		1.32			0.42		0.77	0.84		0.69	0.86	
Uniform Delay, d1		19.5			15.8		23.3	12.6		26.9	16.2	
Progression Factor		1.00			1.00		0.91	1.06		0.98	1.06	
Incremental Delay, d2		162.2			0.5		13.1	8.4		41.0	12.1	
Delay (s)		181.7			16.2		34.3	21.8		67.4	29.2	
Level of Service		F			B		C	C		E	C	
Approach Delay (s)		181.7			16.2			24.1			30.5	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	63.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	102	0	11	17	203	67	5	139	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	107	0	12	18	214	71	5	146	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	81	119	302	153								
Volume Left (vph)	4	107	18	5								
Volume Right (vph)	62	12	71	1								
Hadj (s)	-0.42	0.16	-0.09	0.04								
Departure Headway (s)	4.7	5.3	4.5	4.8								
Degree Utilization, x	0.11	0.17	0.38	0.20								
Capacity (veh/h)	674	623	762	709								
Control Delay (s)	8.3	9.3	10.3	9.1								
Approach Delay (s)	8.3	9.3	10.3	9.1								
Approach LOS	A	A	B	A								

Intersection Summary			
Delay	9.6		
HCM Level of Service	A		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	120	47	25	698	409	121
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	49	26	735	424	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked						
vC, conflicting volume	1275	488	552			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1275	488	552			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	30	91	97			
cM capacity (veh/h)	179	580	1018			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	176	26	735	552
Volume Left	126	26	0	0
Volume Right	49	0	0	127
cSH	223	1018	1700	1700
Volume to Capacity	0.79	0.03	0.43	0.32
Queue Length 95th (ft)	143	2	0	0
Control Delay (s)	63.2	8.6	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	63.2	0.3		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1657		1770	3539	1452		3488	
Flt Permitted		0.97	1.00	0.95	0.96		0.23	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1657		428	3539	1452		3250	
Volume (vph)	12	5	95	771	63	53	137	459	360	22	643	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	812	66	56	144	483	379	23	677	63
RTOR Reduction (vph)	0	0	90	0	4	0	0	0	234	0	6	0
Lane Group Flow (vph)	0	18	10	480	450	0	144	483	145	0	757	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.9	6.9	49.4	49.4		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.4	6.4	49.4	49.4		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		105	92	755	744		164	1358	557		1247	
v/s Ratio Prot		c0.01		c0.29	0.27			0.14				
v/s Ratio Perm			0.01				c0.34		0.10		0.23	
v/c Ratio		0.17	0.10	0.64	0.60		0.88	0.36	0.26		0.61	
Uniform Delay, d1		49.3	49.1	23.4	22.9		31.5	24.2	23.2		27.2	
Progression Factor		1.00	1.00	0.32	0.31		1.25	0.83	4.18		1.00	
Incremental Delay, d2		0.6	0.4	3.3	3.0		6.4	0.1	0.1		2.2	
Delay (s)		49.8	49.4	10.9	10.0		45.9	20.1	97.1		29.4	
Level of Service		D	D	B	B		D	C	F		C	
Approach Delay (s)		49.5		10.5				52.8			29.4	
Approach LOS		D		B				D			C	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	343	37	447	708	266	441
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	361	39	471	743	280	464
RTOR Reduction (vph)	0	20	0	0	0	193
Lane Group Flow (vph)	361	19	471	743	280	272
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	25.8	52.7	23.4	77.2	50.3	25.8
Effective Green, g (s)	25.3	52.2	22.9	76.7	49.8	25.3
Actuated g/C Ratio	0.23	0.47	0.21	0.70	0.45	0.23
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	407	751	715	1299	843	364
v/s Ratio Prot	c0.20	0.01	c0.14	c0.40	0.16	0.17
v/s Ratio Perm						
v/c Ratio	0.89	0.02	0.66	0.57	0.33	0.75
Uniform Delay, d1	41.0	15.4	40.0	8.4	19.4	39.4
Progression Factor	0.69	0.65	0.78	0.30	1.00	1.00
Incremental Delay, d2	18.3	0.0	1.9	1.6	1.1	8.1
Delay (s)	46.6	8.5	32.0	4.1	20.4	47.4
Level of Service	D	A	C	A	C	D
Approach Delay (s)	42.9			15.2	37.3	
Approach LOS	D			B	D	

Intersection Summary			
HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.99	
Flt Protected		0.95	1.00	0.95	0.95		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1770	1863	1583	1681		1689	3539	1583		1770	
Flt Permitted		0.95	1.00	1.00	0.95		0.95	1.00	1.00		1.00	
Satd. Flow (perm)		1770	1863	1583	1681		1689	3539	1583		1770	
Volume (vph)		172	370	60	886	14	0	11	701	1594	269	563
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)		181	389	63	722	15	0	12	738	1678	283	593
RTOR Reduction (vph)		0	0	18	0	0	0	0	0	0	0	2
Lane Group Flow (vph)		181	389	45	361	376	0	12	738	1678	283	640
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Turn Type		Split		Perm	Split			Prot		Free	Prot	
Protected Phases		7	7		8	8		5	2		1	6
Permitted Phases				7						Free		
Actuated Green, G (s)		16.2	16.2	16.2	23.0	23.0		1.2	23.9	96.5	17.9	40.6
Effective Green, g (s)		15.7	15.7	15.7	23.0	23.0		0.7	24.4	96.5	17.4	41.1
Actuated g/C Ratio		0.16	0.16	0.16	0.24	0.24		0.01	0.25	1.00	0.18	0.43
Clearance Time (s)		3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5
Vehicle Extension (s)		2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5
Lane Grp Cap (vph)		288	303	258	401	403		13	895	1583	319	778
v/s Ratio Prot		0.10	0.21		0.21	0.22		0.01	0.21		0.16	0.36
v/s Ratio Perm				0.03						c1.06		
v/c Ratio		0.63	1.28	0.18	0.90	0.93		0.92	0.82	1.06	0.89	0.82
Uniform Delay, d1		37.7	40.4	34.8	35.6	36.0		47.9	34.0	48.2	38.6	24.5
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.1	150.5	0.1	22.6	28.4		205.3	6.1	40.4	23.7	6.9
Delay (s)		40.8	190.9	34.9	58.3	64.4		253.1	40.1	88.7	62.3	31.3
Level of Service		D	F	C	E	E		F	D	F	E	C
Approach Delay (s)			152.5			61.4			74.7			40.8
Approach LOS			F			E			E			D

Intersection Summary			
HCM Average Control Delay	73.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3227			2916	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3227			2916	1399				3433		1583
Volume (vph)	140	403	575	0	522	2065	0	0	0	1021	0	330
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	424	605	0	549	2174	0	0	0	1075	0	347
RTOR Reduction (vph)	0	235	0	0	266	0	0	0	0	0	0	177
Lane Group Flow (vph)	147	794	0	0	1170	1287	0	0	0	1075	0	170
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	66.2			42.2	110.0				35.3		35.3
Effective Green, g (s)	20.0	66.2			42.2	110.0				35.8		35.8
Actuated g/C Ratio	0.18	0.60			0.38	1.00				0.33		0.33
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1942			1119	1399				1117		515
v/s Ratio Prot	0.08	0.25			c0.40							0.11
v/s Ratio Perm						c0.92				0.31		
v/c Ratio	0.46	0.41			1.12dr	0.92				0.96		0.33
Uniform Delay, d1	40.2	11.6			33.9	0.0				36.4		28.0
Progression Factor	1.00	1.00			0.84	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.6			23.5	1.3				18.5		0.3
Delay (s)	40.5	12.2			51.9	1.3				54.9		28.3
Level of Service	D	B			D	A				D		C
Approach Delay (s)		15.7			28.0			0.0		48.4		
Approach LOS		B			C			A		D		

Intersection Summary				
HCM Average Control Delay	30.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	86.7%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0	4.0		
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4635	1348	1681	1511	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4635	1348	1681	1511	659			
Volume (vph)	142	1280	0	0	2017	434	571	226	1186	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	1347	0	0	2123	457	601	238	1248	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	271	0	86	6	0	0	0
Lane Group Flow (vph)	149	1347	0	0	2123	186	601	775	818	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	56.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	56.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	335	1489			1687	490	565	508	335			
v/s Ratio Prot	0.08	c0.38			c0.46		0.36	0.51	c0.94			
v/s Ratio Perm						0.14						
v/c Ratio	0.44	0.90			1.26	0.38	1.06	1.53	1.84			
Uniform Delay, d1	39.3	29.9			35.0	25.8	36.5	36.5	27.0			
Progression Factor	1.56	0.36			0.94	1.27	1.00	1.00	1.00			
Incremental Delay, d2	2.3	5.5			117.9	0.7	55.9	247.6	391.0			
Delay (s)	63.5	16.3			150.7	33.5	92.4	284.1	418.0			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		21.0			130.0			269.9			0.0	
Approach LOS		C			F			F			A	

Intersection Summary				
HCM Average Control Delay	150.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.60			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1803	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	3433	3363	1219	1770	3539	1583	1681	1703	1583		1803	2628
Volume (vph)	667	1021	779	325	1174	300	132	16	66	322	163	1037
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	702	1075	820	342	1236	316	139	17	69	339	172	1092
RTOR Reduction (vph)	0	3	138	0	0	35	0	0	60	0	0	86
Lane Group Flow (vph)	702	1120	636	342	1236	281	76	80	9	0	511	1006
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.5	33.5	51.5	17.5	32.5	32.5	14.5	14.5	14.5		30.5	48.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1009	565	274	1062	475	214	217	201		492	1123
v/s Ratio Prot	0.20	0.33	c0.52	0.19	c0.35		0.05	0.05			c0.28	0.38
v/s Ratio Perm						0.18			0.01			
v/c Ratio	1.32	1.11	1.13	1.25	1.16	0.59	0.36	0.37	0.04		1.04	0.90
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	32.8	43.9	44.0	42.1		40.0	29.2
Progression Factor	1.20	1.05	1.12	1.06	1.07	1.13	1.02	1.03	2.10		0.96	0.78
Incremental Delay, d2	146.2	51.2	59.2	132.8	82.0	4.1	0.7	0.7	0.1		46.7	9.2
Delay (s)	202.0	91.5	92.2	182.2	123.1	41.1	45.6	45.8	88.7		85.9	32.0
Level of Service	F	F	F	F	F	D	D	D	F		F	C
Approach Delay (s)		121.6			120.1			58.9			49.2	
Approach LOS		F			F			E			D	

Intersection Summary				
HCM Average Control Delay	100.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	98.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.86					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3362	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3362	2787					3526			1863	
Volume (vph)	121	156	924	0	0	0	0	1130	25	0	302	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	164	867	0	0	0	0	1189	26	0	318	0
RTOR Reduction (vph)	0	0	192	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	94	197	675	0	0	0	0	1214	0	0	318	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			6
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	36.0	36.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			36.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.24					c0.34			0.17	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.40					0.59			0.62	
Uniform Delay, d1	25.4	25.4	11.6					14.3			30.0	
Progression Factor	1.26	1.24	1.81					1.00			1.22	
Incremental Delay, d2	0.6	0.3	0.1					1.2			3.1	
Delay (s)	32.6	31.7	21.2					15.6			39.6	
Level of Service	C	C	C					B			D	
Approach Delay (s)		23.9			0.0			15.6			39.6	
Approach LOS		C			A			B			D	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3357		1770	3480		1770	1846		1770	1863	1539
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3357		1770	3480		1770	1846		1770	1863	1539
Volume (vph)	190	822	290	20	723	56	532	510	27	68	243	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	865	305	21	761	59	560	537	28	72	256	160
RTOR Reduction (vph)	0	31	0	0	6	0	0	1	0	0	0	133
Lane Group Flow (vph)	200	1139	0	21	814	0	560	564	0	72	256	27
Confl. Peds. (#/hr)			10			22			3			8
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.6	30.4		2.6	22.5		42.6	42.6		19.4	19.4	19.4
Effective Green, g (s)	10.0	30.9		2.1	23.0		42.1	42.1		18.9	18.9	18.9
Actuated g/C Ratio	0.09	0.28		0.02	0.21		0.38	0.38		0.17	0.17	0.17
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	943		34	728		677	707		304	320	264
v/s Ratio Prot	0.11	c0.34		0.01	c0.23		c0.32	0.31		0.04	c0.14	
v/s Ratio Perm												0.02
v/c Ratio	1.24	1.21		0.62	1.12		0.83	0.80		0.24	0.80	0.10
Uniform Delay, d1	50.0	39.6		53.6	43.5		30.7	30.2		39.3	43.7	38.4
Progression Factor	1.24	0.91		1.00	1.00		1.01	1.01		1.24	1.19	2.48
Incremental Delay, d2	147.2	102.7		29.0	71.0		7.9	6.0		0.4	12.3	0.2
Delay (s)	209.3	138.8		82.5	114.6		38.8	36.6		49.0	64.1	95.6
Level of Service	F	F		F	F		D	D		D	E	F
Approach Delay (s)		149.1			113.7			37.7			72.2	
Approach LOS		F			F			D			E	

Intersection Summary			
HCM Average Control Delay	98.7	HCM Level of Service	F
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3422		1770	3481		1770	3491		1770	3477	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3422		1770	3481		1770	3491		1770	3477	
Volume (vph)	151	684	194	102	491	61	179	1215	123	112	1054	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	720	204	107	517	64	188	1279	129	118	1108	147
RTOR Reduction (vph)	0	29	0	0	11	0	0	8	0	0	11	0
Lane Group Flow (vph)	159	895	0	107	570	0	188	1400	0	118	1245	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.7	24.9		8.3	22.5		12.9	31.9		9.8	28.9	
Effective Green, g (s)	9.7	25.4		7.3	23.0		11.9	32.4		8.9	29.4	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.36		0.10	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	966		144	890		234	1257		175	1136	
v/s Ratio Prot	c0.09	c0.26		0.06	0.16		c0.11	c0.40		0.07	0.36	
v/s Ratio Perm												
v/c Ratio	0.83	0.93		0.74	0.64		0.80	1.11		0.67	1.10	
Uniform Delay, d1	39.4	31.4		40.4	29.8		37.9	28.8		39.2	30.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.5	14.3		18.6	1.6		17.8	62.7		9.8	57.0	
Delay (s)	64.8	45.7		59.0	31.4		55.7	91.5		49.0	87.3	
Level of Service	E	D		E	C		E	F		D	F	
Approach Delay (s)		48.5			35.7			87.3			84.0	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	70.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.93			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3374		1770	3539	1523	1770	1692			1814	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3374		1770	3539	1523	1770	1692			1814	
Volume (vph)	26	671	246	80	679	55	242	132	124	96	182	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	706	259	84	715	58	255	139	131	101	192	20
RTOR Reduction (vph)	0	30	0	0	0	34	0	36	0	0	2	0
Lane Group Flow (vph)	27	935	0	84	715	24	255	232	0	0	311	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.2	38.1		7.6	41.5	41.5	18.8	18.8			21.0	
Effective Green, g (s)	3.7	38.1		7.1	41.5	41.5	18.3	18.3			20.5	
Actuated g/C Ratio	0.04	0.38		0.07	0.42	0.42	0.18	0.18			0.20	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	65	1285		126	1469	632	324	310			372	
v/s Ratio Prot	0.02	c0.28		c0.05	c0.20		c0.14	0.14			c0.17	
v/s Ratio Perm						0.02						
v/c Ratio	0.42	0.73		0.67	0.49	0.04	0.79	0.75			0.83	
Uniform Delay, d1	47.1	26.5		45.3	21.4	17.4	39.0	38.7			38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.1	3.6		11.4	1.2	0.1	11.5	9.1			14.6	
Delay (s)	50.2	30.1		56.7	22.6	17.5	50.5	47.8			52.7	
Level of Service	D	C		E	C	B	D	D			D	
Approach Delay (s)		30.7			25.6			49.1			52.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3539	1495	1770	1863	1520	1770	1825	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3428		1770	3539	1495	1770	1863	1520	1770	1825	
Volume (vph)	46	674	139	141	583	234	215	331	133	291	436	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	709	146	148	614	246	226	348	140	306	459	54
RTOR Reduction (vph)	0	17	0	0	0	151	0	0	100	0	4	0
Lane Group Flow (vph)	48	838	0	148	614	95	226	348	40	306	509	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	32.0		11.9	38.6	38.6	12.5	29.1	29.1	12.5	29.1	
Effective Green, g (s)	4.8	32.0		11.4	38.6	38.6	12.0	28.6	28.6	12.0	28.6	
Actuated g/C Ratio	0.05	0.32		0.11	0.39	0.39	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1097		202	1366	577	212	533	435	212	522	
v/s Ratio Prot	0.03	c0.24		c0.08	0.17		0.13	0.19		c0.17	c0.28	
v/s Ratio Perm						0.06			0.03			
v/c Ratio	0.56	0.76		0.73	0.45	0.16	1.07	0.65	0.09	1.44	0.97	
Uniform Delay, d1	46.6	30.6		42.8	22.8	20.1	44.0	31.3	26.2	44.0	35.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.94	
Incremental Delay, d2	6.8	5.1		12.2	1.1	0.6	80.4	2.6	0.1	220.9	29.8	
Delay (s)	53.4	35.7		55.0	23.9	20.7	124.4	33.9	26.2	263.8	63.0	
Level of Service	D	D		D	C	C	F	C	C	F	E	
Approach Delay (s)		36.6			27.7			81.0			138.0	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM Average Control Delay	63.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1022	44	98	958	12	33	12	98	0	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1076	46	101	1008	13	35	13	103	0	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1019			1122			1864	2366	561	1908	2383	509
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1019			1122			1864	2366	561	1908	2383	509
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			84			0	55	78	100	69	98
cM capacity (veh/h)	677			616			29	20	471	16	27	509

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	23	717	405	101	671	348	41	109	18
Volume Left	23	0	0	101	0	0	35	0	0
Volume Right	0	0	46	0	0	13	0	103	9
cSH	677	1700	1700	616	1700	1700	29	246	55
Volume to Capacity	0.03	0.42	0.24	0.16	0.39	0.20	1.43	0.44	0.33
Queue Length 95th (ft)	3	0	0	15	0	0	119	53	29
Control Delay (s)	10.6	0.0	0.0	12.0	0.0	0.0	529.0	30.0	100.1
Lane LOS	B			B			F	D	F
Approach Delay (s)	0.2			1.1			166.7		100.1
Approach LOS							F		F

Intersection Summary					
Average Delay	11.6				
Intersection Capacity Utilization	63.5%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3432		1770	3490			1809	1555		1813	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3432		1770	3490			1809	1555		1813	
Volume (vph)	30	972	159	158	874	57	189	130	286	27	135	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	1023	167	166	920	60	199	137	301	28	145	20
RTOR Reduction (vph)	0	11	0	0	4	0	0	0	210	0	4	0
Lane Group Flow (vph)	32	1179	0	166	976	0	0	336	91	0	169	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	35.6		13.0	39.9			21.8	21.8		15.1	
Effective Green, g (s)	8.2	35.6		12.5	39.9			21.3	21.3		14.6	
Actuated g/C Ratio	0.08	0.36		0.12	0.40			0.21	0.21		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1222		221	1393			385	331		265	
v/s Ratio Prot	0.02	c0.34		0.09	c0.28			c0.19			c0.10	
v/s Ratio Perm									0.06			
v/c Ratio	0.22	0.96		0.75	0.70			0.87	0.27		0.71	
Uniform Delay, d1	42.9	31.8		42.2	25.1			38.0	32.9		40.7	
Progression Factor	1.00	1.00		1.17	0.81			1.00	1.00		1.00	
Incremental Delay, d2	0.6	18.6		1.3	0.3			18.9	0.3		8.2	
Delay (s)	43.6	50.2		50.8	15.7			57.0	33.2		48.9	
Level of Service	D	D		D	B			E	C		D	
Approach Delay (s)		50.0			20.7			45.8			48.9	
Approach LOS		D			C			D			D	

Intersection Summary					
HCM Average Control Delay	38.6	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	86.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3292		1770	3374		3433	3531		1770	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3292		1770	3374		3433	3531		1770	3479	
Volume (vph)	207	691	391	47	495	180	497	1203	15	267	1174	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	218	727	412	49	521	189	523	1266	16	281	1236	107
RTOR Reduction (vph)	0	78	0	0	36	0	0	1	0	0	6	0
Lane Group Flow (vph)	218	1061	0	49	674	0	523	1281	0	281	1337	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	15.0	29.4		5.6	20.0		14.0	36.4		15.6	38.0	
Effective Green, g (s)	14.0	28.4		4.6	19.0		13.0	36.4		14.6	38.0	
Actuated g/C Ratio	0.14	0.28		0.05	0.19		0.13	0.36		0.15	0.38	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	248	935		81	641		446	1265		258	1322	
v/s Ratio Prot	c0.12	c0.32		0.03	0.20		0.15	c0.36		0.16	c0.38	
v/s Ratio Perm												
v/c Ratio	0.88	1.13		0.60	1.05		1.17	1.00		1.09	1.01	
Uniform Delay, d1	42.2	35.8		46.8	40.5		43.5	31.7		42.7	31.0	
Progression Factor	0.61	0.85		1.02	0.94		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.5	67.8		7.8	48.3		99.2	24.4		81.9	27.5	
Delay (s)	41.1	98.4		55.4	86.3		142.7	56.2		124.6	58.5	
Level of Service	D	F		E	F		F	E		F	E	
Approach Delay (s)		89.2			84.3			81.2			70.0	
Approach LOS		F			F			F			E	

Intersection Summary					
HCM Average Control Delay	80.3	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.00				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	99.2%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3527		1770	3452			3374			3338	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.72	
Satd. Flow (perm)	1770	3527		1770	3452			3117			2416	
Volume (vph)	22	834	17	45	580	97	19	292	107	81	229	118
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	878	18	47	611	102	20	307	113	85	241	124
RTOR Reduction (vph)	0	2	0	0	20	0	0	69	0	0	80	0
Lane Group Flow (vph)	23	894	0	47	693	0	0	371	0	0	370	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	1.3	26.1		2.8	27.6			10.1			10.1	
Effective Green, g (s)	0.8	26.1		2.3	27.6			9.6			9.6	
Actuated g/C Ratio	0.02	0.52		0.05	0.55			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	28	1841		81	1906			598			464	
v/s Ratio Prot	0.01	c0.25		c0.03	0.20							
v/s Ratio Perm								0.12			c0.15	
v/c Ratio	0.82	0.49		0.58	0.36			0.62			0.80	
Uniform Delay, d1	24.5	7.7		23.4	6.3			18.5			19.3	
Progression Factor	1.01	1.25		1.00	1.00			1.00			1.00	
Incremental Delay, d2	15.1	0.1		6.6	0.5			2.0			9.2	
Delay (s)	40.0	9.8		30.0	6.8			20.5			28.5	
Level of Service	D	A		C	A			C			C	
Approach Delay (s)		10.4			8.3			20.5			28.5	
Approach LOS		B			A			C			C	

Intersection Summary					
HCM Average Control Delay	14.7	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.57				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	74.8%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Unsignalized Intersection Capacity Analysis
1024: Mandela Pkwy & Horton St

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↳			↳			↳			↳	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	372	89	11	86	103	46	19	83	50	65	59	330
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	392	94	12	91	108	48	20	87	53	68	62	347
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	392	105	247	160	478							
Volume Left (vph)	392	0	91	20	68							
Volume Right (vph)	0	12	48	53	347							
Hadj (s)	0.53	0.04	-0.01	-0.14	-0.37							
Departure Headway (s)	8.0	7.4	7.6	7.8	6.6							
Degree Utilization, x	0.87	0.22	0.52	0.35	0.87							
Capacity (veh/h)	441	473	436	415	527							
Control Delay (s)	43.5	11.2	18.8	14.9	39.1							
Approach Delay (s)	36.6		18.8	14.9	39.1							
Approach LOS	E		C	B	E							
Intersection Summary												
Delay			31.6									
HCM Level of Service			D									
Intersection Capacity Utilization			81.2%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1025: W. MacArthur Blvd & Emery Street

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↳			↳			↳			↳	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.94			1.00	0.85		0.96			0.97	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1756			1791	1583		1781			1807	
Flt Permitted	0.95	1.00			0.98	1.00		0.90			0.97	
Satd. Flow (perm)	1770	1756			1791	1583		1612			1760	
Volume (vph)	233	92	57	97	24	25	65	320	152	21	366	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	245	97	60	102	25	26	68	337	160	22	385	106
RTOR Reduction (vph)	0	28	0	0	0	23	0	11	0	0	8	0
Lane Group Flow (vph)	245	129	0	0	127	3	0	554	0	0	505	0
Turn Type	Split			Split			Perm	Perm			Perm	
Protected Phases	3	3		4	4							
Permitted Phases							4	6			2	
Actuated Green, G (s)	12.5	12.5			7.7	7.7		34.1			34.1	
Effective Green, g (s)	11.5	11.5			6.7	6.7		33.1			33.1	
Actuated g/C Ratio	0.18	0.18			0.11	0.11		0.52			0.52	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	322	319			190	168		843			920	
v/s Ratio Prot	c0.14	0.07			c0.07							
v/s Ratio Perm						0.00		c0.34			0.29	
v/c Ratio	0.76	0.40			0.67	0.02		0.66			0.55	
Uniform Delay, d1	24.6	22.9			27.2	25.3		11.0			10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	9.2	0.3			6.7	0.0		1.4			0.4	
Delay (s)	33.8	23.2			34.0	25.4		12.4			10.5	
Level of Service	C	C			C	C		B			B	
Approach Delay (s)		29.8			32.5			12.4			10.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM Average Control Delay			17.9		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			63.3		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			62.1%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1026: Adeline St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↳			↳			↳			↳	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.96			1.00			1.00	
Satd. Flow (prot)		3462			3432			3507			3506	
Flt Permitted		0.76			0.96			1.00			1.00	
Satd. Flow (perm)		2670			3432			3507			3506	
Volume (vph)	112	332	32	121	216	36	0	1444	92	0	1516	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	349	34	127	227	38	0	1520	97	0	1596	106
RTOR Reduction (vph)	0	5	0	0	6	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	496	0	0	384	0	0	1613	0	0	1700	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.15			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		458			523			1971			1970	
v/s Ratio Prot					c0.11			0.46			c0.48	
v/s Ratio Perm		c0.19										
v/c Ratio		1.08			0.73			0.82			0.86	
Uniform Delay, d1		43.5			42.5			18.7			19.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		66.3			4.6			3.9			5.3	
Delay (s)		109.8			47.1			22.6			24.8	
Level of Service		F			D			C			C	
Approach Delay (s)		109.8			47.1			22.6			24.8	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM Average Control Delay			36.1		HCM Level of Service				D			
HCM Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			79.3%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1027: 36th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↳			↳	↱		↳			↳	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95			0.95	1.00		0.95			0.91	
Frt		1.00			1.00	0.85		1.00			1.00	
Flt Protected		0.99			0.99	1.00		1.00			1.00	
Satd. Flow (prot)		3514			3514	1583		3531			5075	
Flt Permitted		0.99			0.99	1.00		0.76			1.00	
Satd. Flow (perm)		3514			3514	1583		2706			5075	
Volume (vph)	0	0	0	64	365	732	49	1005	0	0	1536	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	405	771	52	1058	0	0	1617	22
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	472	694	0	1110	0	0	1637	0
Turn Type				Split			Perm	Perm				
Protected Phases				8	8			2			6	
Permitted Phases							8	2				
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1054	475		1654			3101	
v/s Ratio Prot					0.13						0.32	
v/s Ratio Perm						c0.44		c0.41				
v/c Ratio					0.45	1.46		0.67			0.53	
Uniform Delay, d1					25.5	31.5		11.5			10.0	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.1	218.9		2.2			0.6	
Delay (s)					25.6	250.4		13.7			10.7	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			166.0			13.7			10.7	
Approach LOS		A			F			B			B	
Intersection Summary												
HCM Average Control Delay			59.6		HCM Level of Service				E			
HCM Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			81.8%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2010 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↔		↑↑	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3482						3500		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3482						3500		3433	3539	
Volume (vph)	28	703	78	0	0	0	0	972	78	749	888	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	740	82	0	0	0	0	1023	82	788	935	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	844	0	0	0	0	0	1100	0	788	935	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		26.9						40.6		27.5	74.1	
Effective Green, g (s)		27.9						41.6		28.5	74.1	
Actuated g/C Ratio		0.25						0.38		0.26	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		883						1324		889	2384	
v/s Ratio Prot		c0.24						c0.31		c0.23	0.26	
v/s Ratio Perm												
v/c Ratio		0.96						0.83		0.89	0.39	
Uniform Delay, d1		40.4						31.0		39.2	8.0	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		19.9						6.2		10.3	0.0	
Delay (s)		60.4						37.2		49.5	8.0	
Level of Service		E						D		D	A	
Approach Delay (s)		60.4			0.0			37.2			27.0	
Approach LOS		E			A			D			C	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (vph/h)	0	12	0	105	12	1	0	3	175	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	114	13	1	0	3	190	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			262	255	13	447	255	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			262	255	13	447	255	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	99	82	100	99	100
cM capacity (veh/h)	1604			1605			646	602	1057	404	603	1066

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	128	193	12
Volume Left	0	114	0	1
Volume Right	0	1	190	3
cSH	1604	1605	1053	651
Volume to Capacity	0.00	0.07	0.18	0.02
Queue Length 95th (ft)	0	6	17	1
Control Delay (s)	0.0	6.7	9.2	10.6
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.7	9.2	10.6
Approach LOS			A	B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.91			0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1702			1768		1770	1843	
Flt Permitted	0.63	1.00		0.72	1.00			0.99		0.21	1.00	
Satd. Flow (perm)	1167	1802		1332	1702			1751		383	1843	
Volume (vph)	110	46	13	214	67	91	13	480	292	83	496	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	50	14	233	73	99	14	522	317	90	539	42
RTOR Reduction (vph)	0	10	0	0	71	0	0	36	0	0	5	0
Lane Group Flow (vph)	120	54	0	233	101	0	0	817	0	90	576	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	16.8	16.8		16.8	16.8			28.0		35.2	35.2	
Effective Green, g (s)	16.8	16.8		16.8	16.8			28.0		35.2	35.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.47		0.59	0.59	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	327	505		373	477			817		299	1081	
v/s Ratio Prot		0.03			0.06					0.02	c0.31	
v/s Ratio Perm	0.10			c0.17				c0.47		0.16		
v/c Ratio	0.37	0.11		0.62	0.21			1.00		0.30	0.53	
Uniform Delay, d1	17.3	16.0		18.8	16.5			16.0		8.8	7.5	
Progression Factor	1.00	1.00		1.08	1.17			1.00		1.00	1.00	
Incremental Delay, d2	3.2	0.4		7.7	1.0			31.6		0.6	0.5	
Delay (s)	20.5	16.5		28.1	20.4			47.6		9.4	8.0	
Level of Service	C	B		C	C			D		A	A	
Approach Delay (s)		19.1			24.8			47.6			8.2	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2010 Plus Alt#4 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↑	↑	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1829		1770	1863	1746	
Flt Permitted	1.00		0.95	1.00	0.96	
Satd. Flow (perm)	1829		1770	1863	1746	
Volume (vph)	147	23	39	156	60	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	25	42	172	65	14
RTOR Reduction (vph)	5	0	0	0	13	0
Lane Group Flow (vph)	180	0	42	172	66	0
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	39.7		3.1	46.8	5.2	
Effective Green, g (s)	39.7		3.1	46.8	5.2	
Actuated g/C Ratio	0.66		0.05	0.78	0.09	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1210		91	1453	151	
v/s Ratio Prot	c0.10		c0.02	0.09	c0.04	
v/s Ratio Perm						
v/c Ratio	0.15		0.46	0.12	0.44	
Uniform Delay, d1	3.8		27.6	1.6	26.0	
Progression Factor	0.77		1.00	1.00	1.00	
Incremental Delay, d2	0.2		3.7	0.2	2.0	
Delay (s)	3.1		31.3	1.8	28.0	
Level of Service	A		C	A	C	
Approach Delay (s)	3.1			7.6	28.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	83	3	17	5	159	85	2	84	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	90	3	18	5	173	92	2	91	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	112	271	93
Volume Left (vph)	0	90	5	2
Volume Right (vph)	14	18	92	0
Hadj (s)	-0.49	0.10	0.17	0.04
Departure Headway (s)	4.4	4.8	4.2	4.5
Degree Utilization, x	0.02	0.15	0.31	0.12
Capacity (veh/h)	739	690	836	750
Control Delay (s)	7.5	8.7	9.0	8.2
Approach Delay (s)	7.5	8.7	9.0	8.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay			6.7	
HCM Level of Service			A	
Intersection Capacity Utilization		35.2%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	112	33	23	715	590	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	122	36	25	777	641	153
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					827	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	1545	718	795			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1660	859	751			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	91	96			
cM capacity (veh/h)	85	383	709			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	25	777	795
Volume Left	122	25	0	0
Volume Right	36	0	0	153
cSH	104	709	1700	1700
Volume to Capacity	1.52	0.04	0.46	0.47
Queue Length 95th (ft)	294	3	0	0
Control Delay (s)	349.1	10.3	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	349.1	0.3		0.0
Approach LOS	F			

Intersection Summary				
Average Delay			31.5	
Intersection Capacity Utilization		64.5%	ICU Level of Service	A
Analysis Period (min)			15	

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1646		1770	3539	1488		3485	
Flt Permitted		0.97	1.00	0.95	0.97		0.21	1.00	1.00		0.92	
Satd. Flow (perm)		1810	1583	1681	1646		400	3539	1488		3212	
Volume (vph)	31	22	136	893	78	72	151	456	530	25	561	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	971	85	78	164	496	576	27	610	60
RTOR Reduction (vph)	0	0	41	0	5	0	0	0	318	0	6	0
Lane Group Flow (vph)	0	58	107	587	542	0	164	496	258	0	691	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	39.0	39.0		35.0	35.0	35.0		35.0	
Effective Green, g (s)		24.5	24.5	39.0	39.0		34.5	34.5	34.5		34.5	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.31	0.31	0.31		0.31	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	586	584		125	1110	467		1007	
v/s Ratio Prot		0.03		c0.35	0.33			0.14				
v/s Ratio Perm			c0.07				c0.41		0.17		0.22	
v/c Ratio		0.14	0.30	0.98	0.93		1.31	0.45	0.55		0.69	
Uniform Delay, d1		34.3	35.6	35.2	34.1		37.7	30.1	31.3		33.0	
Progression Factor		1.00	1.00	0.56	0.57		0.44	0.42	1.30		1.00	
Incremental Delay, d2		0.7	2.2	30.2	18.9		145.7	0.1	0.4		3.8	
Delay (s)		35.1	37.8	50.5	38.2		162.3	12.7	41.1		36.8	
Level of Service		D	D	D	D		F	B	D		D	
Approach Delay (s)		37.1			44.8			45.8			36.8	
Approach LOS		D			D			D			D	

Intersection Summary						
HCM Average Control Delay		42.9	HCM Level of Service		D	
HCM Volume to Capacity ratio		0.93				
Actuated Cycle Length (s)		110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization		86.3%	ICU Level of Service		E	
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	489	72	655	933	290	404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	532	78	712	1014	315	439
RTOR Reduction (vph)	0	34	0	0	0	22
Lane Group Flow (vph)	532	44	712	1014	315	417
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	31.5	62.2	27.2	71.0	40.8	75.8
Effective Green, g (s)	31.0	61.7	26.7	71.0	40.3	75.3
Actuated g/C Ratio	0.28	0.56	0.24	0.65	0.37	0.68
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	499	886	833	1202	683	1084
v/s Ratio Prot	c0.30	0.03	0.21	c0.54	0.17	0.26
v/s Ratio Perm						
v/c Ratio	1.07	0.05	0.85	0.84	0.46	0.38
Uniform Delay, d1	39.5	10.9	39.8	15.2	26.6	7.4
Progression Factor	0.59	0.44	0.59	1.86	1.00	1.00
Incremental Delay, d2	52.5	0.0	4.5	3.8	2.2	0.2
Delay (s)	75.7	4.9	27.9	32.0	28.8	7.7
Level of Service	E	A	C	C	C	A
Approach Delay (s)	66.6			30.3	16.5	
Approach LOS	E			C	B	

Intersection Summary						
HCM Average Control Delay		34.1	HCM Level of Service		C	
HCM Volume to Capacity ratio		0.91				
Actuated Cycle Length (s)		110.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization		82.9%	ICU Level of Service		E	
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1682		1770	3539	1583	1770	1836	
Volume (vph)	26	21	7	1003	13	16	41	303	1302	135	442	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	1090	14	17	45	329	1415	147	480	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	3	0
Lane Group Flow (vph)	28	23	0	589	551	0	45	329	1415	147	511	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.5	3.5	3.5	26.0	26.0		4.0	19.6	73.3	8.7	24.3	
Effective Green, g (s)	3.0	3.0	3.0	26.0	26.0		3.5	20.1	73.3	8.2	24.8	
Actuated g/C Ratio	0.04	0.04	0.04	0.35	0.35		0.05	0.27	1.00	0.11	0.34	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	72	76	65	596	597		85	970	1583	198	621	
v/s Ratio Prot	0.02	0.01		0.34	0.33		0.03	0.09		0.08	0.28	
v/s Ratio Perm			0.00						c0.89			
v/c Ratio	0.39	0.30	0.01	0.99	0.92		0.53	0.34	0.89	0.74	0.82	
Uniform Delay, d1	34.3	34.1	33.7	23.1	22.7		34.1	21.3	0.0	31.5	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8	0.0	25.8	19.9		2.7	0.2	8.2	12.3	8.5	
Delay (s)	35.5	35.0	33.7	48.9	42.6		36.8	21.4	8.2	43.8	30.7	
Level of Service	D	C	C	D	D		D	C	A	D	C	
Approach Delay (s)		35.1			45.8			11.3			33.7	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM Average Control Delay	26.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	1.00			0.91	0.85				1.00		0.86
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3537			2948	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3537			2948	1399				3433		1583
Volume (vph)	113	281	1	0	359	1543	0	0	0	1223	0	242
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	305	1	0	390	1677	0	0	0	1329	0	263
RTOR Reduction (vph)	0	0	0	0	190	0	0	0	0	0	0	116
Lane Group Flow (vph)	123	306	0	0	727	1150	0	0	0	1329	0	147
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.8	55.6			40.3	110.0				45.9		45.9
Effective Green, g (s)	11.3	55.6			40.3	110.0				46.4		46.4
Actuated g/C Ratio	0.10	0.51			0.37	1.00				0.42		0.42
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	182	1788			1080	1399				1448		668
v/s Ratio Prot	0.07	0.09			0.25					c0.39		0.09
v/s Ratio Perm						c0.82						
v/c Ratio	0.68	0.17			0.67	0.82				0.92		0.22
Uniform Delay, d1	47.6	14.7			29.3	0.0				30.0		20.3
Progression Factor	1.00	1.00			1.10	1.00				1.00		1.00
Incremental Delay, d2	7.6	0.2			1.4	2.4				9.5		0.1
Delay (s)	55.2	14.9			33.6	2.4				39.6		20.4
Level of Service	E	B			C	A				D		C
Approach Delay (s)		26.5			18.3			0.0			36.3	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	25.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	111	1392	0	0	1516	419	386	21	1372	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1513	0	0	1648	455	420	23	1491	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	291	0	161	1	0	0	0
Lane Group Flow (vph)	121	1513	0	0	1648	164	420	607	745	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	10.8	37.0			39.7	39.7	48.0	48.0	65.0			
Effective Green, g (s)	10.3	37.0			39.7	39.7	48.0	48.0	65.0			
Actuated g/C Ratio	0.09	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	166	1197			1674	526	734	632	389			
v/s Ratio Prot	0.07	c0.43			c0.36		0.25	0.42	c1.13			
v/s Ratio Perm						0.11						
v/c Ratio	0.73	1.26			0.98	0.31	0.57	0.96	1.92			
Uniform Delay, d1	48.5	36.5			34.8	25.3	23.3	30.1	22.5			
Progression Factor	1.24	0.59			0.96	1.20	1.00	1.00	1.00			
Incremental Delay, d2	9.0	123.6			13.4	0.9	3.2	27.4	421.5			
Delay (s)	69.2	145.0			46.8	31.2	26.5	57.5	444.0			
Level of Service	E	F			D	C	C	E	F			
Approach Delay (s)		139.4			43.4			198.9			0.0	
Approach LOS		F			D			F			A	

Intersection Summary				
HCM Average Control Delay	124.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.72			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	90.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.94	0.85	1.00	1.00	0.86	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1815	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3101	1219	1770	3539	1524	1681	1719	1497		1815	2628
Volume (vph)	754	758	1261	350	868	305	227	62	101	299	270	1034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	820	825	1360	380	726	332	247	67	110	325	293	1124
RTOR Reduction (vph)	0	120	85	0	0	91	0	0	88	0	0	34
Lane Group Flow (vph)	820	1331	649	380	726	241	153	161	12	0	618	1090
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	987	521	274	1062	457	183	188	163		495	1266
v/s Ratio Prot	0.24	c0.43	c0.53	c0.21	0.21		0.09	0.09			c0.34	0.41
v/s Ratio Perm						0.16			0.01			
v/c Ratio	1.38	1.35	1.25	1.39	0.68	0.53	0.84	0.86	0.07		1.25	0.86
Uniform Delay, d1	45.5	37.5	31.5	46.5	33.9	32.0	48.0	48.2	44.0		40.0	25.2
Progression Factor	1.23	1.03	1.08	1.00	1.00	1.00	1.26	1.26	2.47		0.80	0.67
Incremental Delay, d2	173.2	157.5	111.8	195.1	3.6	4.3	23.7	26.6	0.1		121.2	4.6
Delay (s)	229.4	196.3	145.7	241.6	37.5	36.3	84.3	87.3	108.7		157.4	21.6
Level of Service	F	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		193.0			91.2			91.8			69.8	
Approach LOS		F			F			F			E	

Intersection Summary				
HCM Average Control Delay	131.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	114.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.86					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3365	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3365	2787					3532			1863	
Volume (vph)	167	228	1144	0	0	0	0	1556	21	0	384	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	248	1243	0	0	0	0	1690	23	0	396	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	138	292	1137	0	0	0	0	1712	0	0	396	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.41					c0.48			0.21	
v/s Ratio Perm												
v/c Ratio	0.21	0.22	0.87					0.92			0.46	
Uniform Delay, d1	21.7	21.7	26.3					23.9			20.4	
Progression Factor	1.03	1.04	1.10					0.66			0.52	
Incremental Delay, d2	0.7	0.3	5.7					6.4			1.7	
Delay (s)	23.0	22.8	34.5					19.8			12.4	
Level of Service	C	C	C					B			B	
Approach Delay (s)		31.5			0.0			19.8			12.4	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3334		1770	3509		1770	1833		1770	1863	1548
Volume (vph)	86	622	344	38	751	36	284	219	22	36	230	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	676	374	41	816	39	309	238	24	39	250	103
RTOR Reduction (vph)	0	101	0	0	5	0	0	5	0	0	0	83
Lane Group Flow (vph)	93	949	0	41	850	0	309	257	0	39	250	20
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.7		2.3	18.0		14.2	14.2		12.8	12.8	12.8
Effective Green, g (s)	4.0	19.7		2.3	18.0		14.2	14.2		12.8	12.8	12.8
Actuated g/C Ratio	0.06	0.30		0.04	0.28		0.22	0.22		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	109	1010		69	972		387	400		349	367	305
v/s Ratio Prot	c0.05	c0.28		0.02	0.24		c0.17	0.14		0.02	c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.85	0.94		0.65	0.87		0.80	0.64		0.11	0.68	0.07
Uniform Delay, d1	30.2	22.1		31.0	22.4		24.0	23.1		21.4	24.2	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.8	15.6		21.6	6.8		10.9	3.5		0.1	5.1	0.1
Delay (s)	74.1	37.7		52.5	31.3		35.0	26.6		21.6	29.3	21.3
Level of Service	E	D		D	C		C	C		C	C	C
Approach Delay (s)		40.7			32.2			31.1			26.5	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3436		1770	3519			1802	1555		1774	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3436		1770	3519			1802	1555		1774	
Volume (vph)	16	1039	184	175	1117	29	140	68	218	7	34	14
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1129	178	190	1214	32	152	74	237	8	37	15
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	196	0	13	0
Lane Group Flow (vph)	20	1298	0	190	1245	0	0	226	39	0	47	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	44.2		11.6	54.2			17.1	17.1		12.6	
Effective Green, g (s)	1.1	44.2		11.1	54.2			16.6	16.6		12.1	
Actuated g/C Ratio	0.01	0.44		0.11	0.54			0.17	0.17		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1519		196	1907			299	258		215	
v/s Ratio Prot	0.01	c0.38		c0.11	0.35			c0.13			c0.03	
v/s Ratio Perm									0.03			
v/c Ratio	1.05	0.85		0.97	0.65			0.76	0.15		0.22	
Uniform Delay, d1	49.4	25.0		44.3	16.2			39.8	35.7		39.7	
Progression Factor	1.05	0.54		0.81	0.87			1.00	1.00		1.00	
Incremental Delay, d2	217.1	6.0		23.6	0.4			9.9	0.2		0.4	
Delay (s)	269.1	19.4		59.2	11.4			49.7	35.9		40.0	
Level of Service	F	B		E	B			D	D		D	
Approach Delay (s)		23.1			17.7			42.6			40.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

2010 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.97	0.95		1.00	0.95
Frpb, ped/bikes	1.00	0.92		1.00	0.97			1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.94		1.00	0.98			1.00	1.00		1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	3065		1770	3364			3433	3511		1770	3339
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (perm)	1770	3065		1770	3364			3433	3511		1770	3339
Volume (vph)	167	656	422	72	540	102	572	909	26	147	936	184
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	715	459	78	587	111	622	988	27	160	1017	200
RTOR Reduction (vph)	0	102	0	0	15	0	0	2	0	0	17	0
Lane Group Flow (vph)	182	1072	0	78	683	0	622	1013	0	160	1200	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.2	32.3		5.2	24.3		16.5	34.3		12.2	30.0	
Effective Green, g (s)	12.7	32.3		4.7	24.3		16.0	35.3		11.7	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	225	990		83	817		549	1239		207	1035	
v/s Ratio Prot	c0.10	c0.35		0.04	0.20		c0.18	0.29		0.09	c0.36	
v/s Ratio Perm												
v/c Ratio	0.81	1.08		0.94	0.84		1.13	0.82		0.77	1.16	
Uniform Delay, d1	42.5	33.8		47.5	36.0		42.0	29.4		42.9	34.5	
Progression Factor	1.18	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.5	49.1		77.0	9.9		80.6	6.1		15.0	82.9	
Delay (s)	62.4	63.4		124.5	45.8		122.6	35.5		57.8	117.4	
Level of Service	E	E		F	D		F	D		E	F	
Approach Delay (s)		63.3			53.8			68.6			110.5	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM Average Control Delay	76.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

SYNCHRO LOS SHEETS
ALTERNATIVE #4
2030

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3379		1770	3502		1770	3436		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3379		1770	3502		1770	3436		1770	1863	1583
Volume (vph)	577	881	380	118	778	59	124	271	66	68	283	203
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	927	400	124	819	62	131	285	69	72	298	214
RTOR Reduction (vph)	0	42	0	0	5	0	0	20	0	0	0	177
Lane Group Flow (vph)	607	1285	0	124	876	0	131	334	0	72	298	37
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	35.0	46.7		11.1	24.8		14.3	14.3		18.9	18.9	18.9
Effective Green, g (s)	35.0	49.7		11.1	25.8		14.3	14.3		18.9	18.9	18.9
Actuated g/C Ratio	0.32	0.46		0.10	0.23		0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	563	1527		179	821		230	447		304	320	272
v/s Ratio Prot	c0.34	0.38		0.07	c0.25		0.07	c0.10		0.04	c0.16	
v/s Ratio Perm												0.02
v/c Ratio	1.08	0.84		0.69	1.07		0.57	0.75		0.24	0.93	0.14
Uniform Delay, d1	37.5	26.7		47.8	42.1		45.0	46.1		39.3	44.9	36.6
Progression Factor	1.00	1.00		0.87	1.14		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	60.7	5.8		3.0	37.7		2.6	6.4		0.4	32.6	0.2
Delay (s)	98.2	32.4		44.6	85.7		47.6	52.5		39.7	77.7	36.8
Level of Service	F	C		D	F		D	D		D	E	D
Approach Delay (s)		53.1			80.7			51.1			66.8	
Approach LOS		D			F			D			E	

Intersection Summary			
HCM Average Control Delay	60.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98			0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451			3420		1770	3483		1770	3462	
Flt Permitted	0.19	1.00			0.60		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	356	3451			2053		1770	3483		1770	3462	
Volume (vph)	123	746	148	104	602	162	218	801	95	119	916	156
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	785	156	109	634	171	229	843	100	125	986	164
RTOR Reduction (vph)	0	15	0	0	18	0	0	8	0	0	12	0
Lane Group Flow (vph)	129	926	0	0	896	0	229	935	0	125	1118	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		15.7	33.0		16.0	33.3	
Effective Green, g (s)	48.0	48.0			48.0		15.7	34.0		16.0	34.3	
Actuated g/C Ratio	0.44	0.44			0.44		0.14	0.31		0.15	0.31	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	155	1506			896		253	1077		257	1080	
v/s Ratio Prot		0.27					0.13	c0.27		0.07	c0.32	
v/s Ratio Perm	0.36				c0.44							
v/c Ratio	0.83	0.61			1.00		0.91	0.87		0.49	1.03	
Uniform Delay, d1	27.4	23.9			31.0		46.4	35.9		43.2	37.8	
Progression Factor	0.39	0.39			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.5	0.4			29.8		32.4	9.5		1.5	36.8	
Delay (s)	30.1	9.7			60.8		78.8	45.3		44.7	74.6	
Level of Service	C	A			E		E	D		D	E	
Approach Delay (s)		12.1			60.8			51.9			71.6	
Approach LOS		B			E			D			E	

Intersection Summary			
HCM Average Control Delay	49.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	3	2	138	55	1	2	0	102	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3	2	145	58	1	2	0	107	0	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	59			5			354	354	4	461	354	58
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			5			354	354	4	461	354	58
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	100	90	100	100	100
cM capacity (veh/h)	1545			1616			569	520	1079	429	520	1007
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	204	109	1								
Volume Left	0	145	2	0								
Volume Right	2	1	107	0								
cSH	1545	1616	1060	520								
Volume to Capacity	0.00	0.09	0.10	0.00								
Queue Length 95th (ft)	0	7	9	0								
Control Delay (s)	0.0	5.5	8.8	11.9								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	5.5	8.8	11.9								
Approach LOS			A	B								

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰			↟			↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	4.0
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.99		1.00	0.88		0.95			1.00	0.96
Flt Protected		0.95	1.00		0.95	1.00		1.00			0.95	1.00
Satd. Flow (prot)		1770	1842		1770	1632		1769			1770	1797
Flt Permitted		0.54	1.00		0.71	1.00		0.96			0.37	1.00
Satd. Flow (perm)		997	1842		1326	1632		1704			695	1797
Volume (vph)	66	61	5	153	47	222	11	144	88	120	496	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	64	5	161	49	234	12	152	91	126	522	160
RTOR Reduction (vph)	0	3	0	0	131	0	0	37	0	0	23	0
Lane Group Flow (vph)	69	66	0	161	152	0	0	216	0	126	659	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			15.6		26.2	26.2	
Effective Green, g (s)	26.3	26.3		26.3	26.3			15.1		26.7	25.7	
Actuated g/C Ratio	0.44	0.44		0.44	0.44			0.25		0.43	0.43	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	437	807		581	715			429		416	770	
v/s Ratio Prot		0.04			0.09					0.05	c0.37	
v/s Ratio Perm	0.07			c0.12				0.13		0.10		
v/c Ratio	0.16	0.08		0.28	0.21			0.51		0.30	0.86	
Uniform Delay, d1	10.2	9.8		10.8	10.4			19.3		11.6	15.5	
Progression Factor	1.00	1.00		0.70	0.38			1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.2		1.2	0.7			1.0		0.4	9.2	
Delay (s)	10.9	10.0		8.7	4.7			20.2		12.1	24.7	
Level of Service	B	B		A	A			C		B	C	
Approach Delay (s)		10.5			6.1			20.2			22.7	
Approach LOS		B			A			C			C	

Intersection Summary				
HCM Average Control Delay	16.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↟		↰	↟	↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1855		1770	1863	1762	
Flt Permitted	1.00		0.59	1.00	0.96	
Satd. Flow (perm)	1855		1093	1863	1762	
Volume (vph)	259	9	50	253	169	14
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	9	53	266	178	15
RTOR Reduction (vph)	1	0	0	0	8	0
Lane Group Flow (vph)	281	0	53	266	185	0
Turn Type			Perm			
Protected Phases	2			6	6	
Permitted Phases			6			
Actuated Green, G (s)	43.6		43.6	43.6	8.4	
Effective Green, g (s)	43.1		43.1	43.1	8.9	
Actuated g/C Ratio	0.72		0.72	0.72	0.15	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1333		785	1338	261	
v/s Ratio Prot	c0.15			0.14	c0.11	
v/s Ratio Perm			0.05			
v/c Ratio	0.21		0.07	0.20	0.71	
Uniform Delay, d1	2.8		2.5	2.8	24.3	
Progression Factor	0.97		1.00	1.00	1.00	
Incremental Delay, d2	0.4		0.2	0.3	8.8	
Delay (s)	3.1		2.7	3.1	33.1	
Level of Service	A		A	A	C	
Approach Delay (s)	3.1			3.0	33.1	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	10.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟		↰	↑	↱	↰	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			1.00		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1730			1834		1770	1851		1770	1806	
Flt Permitted		0.88			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1535			1507		1770	1851		1770	1806	
Volume (vph)	77	92	132	37	112	4	36	336	14	23	524	136
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	97	139	39	118	4	38	356	15	24	552	143
RTOR Reduction (vph)	0	56	0	0	2	0	0	2	0	0	15	0
Lane Group Flow (vph)	0	261	0	0	159	0	38	369	0	24	679	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		10.5			10.5		2.9	26.6		1.4	25.1	
Effective Green, g (s)		10.0			10.0		2.4	27.1		0.9	25.6	
Actuated g/C Ratio		0.20			0.20		0.05	0.54		0.02	0.51	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		307			301		85	1003		32	925	
v/s Ratio Prot							c0.02	0.20		0.01	c0.38	
v/s Ratio Perm		c0.17			0.11							
v/c Ratio		0.85			0.53		0.45	0.37		0.75	0.73	
Uniform Delay, d1		19.3			17.9		23.2	6.5		24.4	9.5	
Progression Factor		1.00			1.00		0.89	1.14		1.00	1.00	
Incremental Delay, d2		19.4			1.3		2.7	1.0		62.8	5.1	
Delay (s)		38.7			19.2		23.4	8.5		87.2	14.7	
Level of Service		D			B		C	A		F	B	
Approach Delay (s)		38.7			19.2			9.9			17.1	
Approach LOS		D			B			A			B	

Intersection Summary				
HCM Average Control Delay	19.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↟			↟	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	2	6	52	12	4	22	101	63	0	139	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	2	6	55	13	4	23	106	66	0	146	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	72	196	152
Volume Left (vph)	2	55	23	0
Volume Right (vph)	6	4	66	5
Hadj (s)	-0.29	0.15	-0.15	0.01
Departure Headway (s)	4.5	4.8	4.1	4.3
Degree Utilization, x	0.01	0.10	0.22	0.18
Capacity (veh/h)	730	689	846	801
Control Delay (s)	7.5	8.3	8.3	8.3
Approach Delay (s)	7.5	8.3	8.3	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.3			
HCM Level of Service	A			
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	68	22	29	190	576	79
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	72	23	31	200	606	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					854	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	909	648	689			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	531	586			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	94	96			
cM capacity (veh/h)	229	412	742			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	95	31	200	689
Volume Left	72	31	0	0
Volume Right	23	0	0	83
cSH	257	742	1700	1700
Volume to Capacity	0.37	0.04	0.12	0.41
Queue Length 95th (ft)	41	3	0	0
Control Delay (s)	27.0	10.1	0.0	0.0
Lane LOS	D	B		
Approach Delay (s)	27.0	1.3		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frt		1.00	0.85	1.00	0.96		1.00	1.00	0.85		1.00	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1667		1770	3539	1583		3521	
Flt Permitted		0.97	1.00	0.95	0.96		0.50	1.00	1.00		0.94	
Satd. Flow (perm)		1810	1583	1681	1667		935	3539	1583		3308	
Volume (vph)	39	28	117	497	4	29	60	262	332	17	372	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	29	123	523	4	31	63	276	349	18	392	6
RTOR Reduction (vph)	0	0	116	0	5	0	0	0	118	0	1	0
Lane Group Flow (vph)	0	70	7	289	264	0	63	276	231	0	417	0
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		6.4	6.4	16.0	16.0		66.6	66.6	66.6		66.6	
Effective Green, g (s)		5.9	5.9	16.0	16.0		66.1	66.1	66.1		66.1	
Actuated g/C Ratio		0.06	0.06	0.16	0.16		0.66	0.66	0.66		0.66	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		107	93	269	267		618	2339	1046		2187	
v/s Ratio Prot		c0.04		c0.17	0.16			0.08				
v/s Ratio Perm			0.00				0.07		c0.15		0.13	
v/c Ratio		0.65	0.08	1.07	0.99		0.10	0.12	0.22		0.19	
Uniform Delay, d1		46.1	44.5	42.0	41.9		6.2	6.2	6.7		6.6	
Progression Factor		1.00	1.00	1.35	1.35		0.08	0.09	1.52		1.00	
Incremental Delay, d2		12.1	0.3	74.3	49.7		0.3	0.1	0.4		0.2	
Delay (s)		58.2	44.7	130.8	106.4		0.7	0.6	10.6		6.8	
Level of Service		E	D	F	F		A	A	B		A	
Approach Delay (s)		49.6			110.1			5.7			6.8	
Approach LOS		D			F			A			A	

Intersection Summary			
HCM Average Control Delay	44.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	294	38	285	247	147	294
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	309	40	300	260	155	309
RTOR Reduction (vph)	0	26	0	0	0	248
Lane Group Flow (vph)	309	14	300	260	155	61
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	20.4	36.0	12.1	72.6	57.0	20.4
Effective Green, g (s)	19.9	35.5	11.6	72.1	56.5	19.9
Actuated g/C Ratio	0.20	0.36	0.12	0.72	0.56	0.20
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	352	562	398	1343	1053	315
v/s Ratio Prot	c0.17	0.01	c0.09	c0.14	0.08	0.04
v/s Ratio Perm						
v/c Ratio	0.88	0.03	0.75	0.19	0.15	0.20
Uniform Delay, d1	38.9	21.0	42.8	4.5	10.3	33.4
Progression Factor	1.10	3.31	0.83	0.31	1.00	1.00
Incremental Delay, d2	20.4	0.0	7.8	0.3	0.3	0.3
Delay (s)	63.2	69.6	43.1	1.7	10.6	33.7
Level of Service	E	E	D	A	B	C
Approach Delay (s)	64.0			23.9	26.0	
Approach LOS	E			C	C	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00		1.00	1.00	0.85	1.00	0.97	
Flt Protected		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	1863	1583	1681		1770	3539	1583	1770	1805	
Flt Permitted		0.95	1.00	1.00	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	1863	1583	1681		1770	3539	1583	1770	1805	
Volume (vph)	5	21	16	756	79	0	88	107	902	76	272	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	22	17	796	83	0	93	113	1044	80	286	75
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	5	22	1	429	452	0	93	113	1044	80	351	0
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.1	3.1	3.1	26.9	26.9		6.6	19.6	70.0	4.9	17.9	
Effective Green, g (s)	2.6	2.6	2.6	26.9	26.9		6.1	20.1	70.0	4.4	18.4	
Actuated g/C Ratio	0.04	0.04	0.04	0.38	0.38		0.09	0.29	1.00	0.06	0.26	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	66	69	59	646	653		154	1016	1583	111	474	
v/s Ratio Prot	0.00	0.01		0.26	0.27		0.05	0.03		0.05	0.19	
v/s Ratio Perm			0.00						c0.66			
v/c Ratio	0.08	0.32	0.01	0.66	0.69		0.60	0.11	0.66	0.72	0.74	
Uniform Delay, d1	32.5	32.8	32.5	17.6	18.1		30.8	18.4	0.0	32.2	23.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.0	2.3	2.9		4.5	0.0	2.2	17.6	5.8	
Delay (s)	32.7	33.8	32.5	20.1	21.0		35.3	18.4	2.2	49.8	29.5	
Level of Service	C	C	C	C	C		D	B	A	D	C	
Approach Delay (s)		33.2			20.6			6.1			33.2	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↱				↰↑		↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0				4.0		4.0
Lane Util. Factor		1.00	0.95		0.91	0.91				0.97		1.00
Frt		1.00	0.93		0.99	0.85				1.00		0.85
Flt Protected		0.95	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		1770	3288		3365	1441				3433		1583
Flt Permitted		0.95	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		1770	3288		3365	1441				3433		1583
Volume (vph)	120	236	211	0	743	1176	0	0	0	889	0	143
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	248	222	0	780	1240	0	0	0	936	0	151
RTOR Reduction (vph)	0	86	0	0	3	0	0	0	0	0	0	103
Lane Group Flow (vph)	126	382	0	0	818	1198	0	0	0	936	0	48
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		
Permitted Phases						Free				4		4
Actuated Green, G (s)	19.5	60.2			37.2	100.0				31.3		31.3
Effective Green, g (s)	19.0	60.2			37.2	100.0				31.8		31.8
Actuated g/C Ratio	0.19	0.60			0.37	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	336	1979			1252	1441				1092		503
v/s Ratio Prot	0.07	0.12			0.24					0.27		
v/s Ratio Perm						c0.83						0.03
v/c Ratio	0.38	0.19			0.66	0.83				0.86		0.10
Uniform Delay, d1	35.3	9.0			26.0	0.0				32.0		24.0
Progression Factor	1.00	1.00			0.65	1.00				1.00		1.00
Incremental Delay, d2	0.3	0.2			0.9	2.0				6.7		0.1
Delay (s)	35.6	9.2			17.8	2.0				38.7		24.0
Level of Service	D	A			B	A				D		C
Approach Delay (s)		14.8			8.4			0.0		36.7		
Approach LOS		B			A			A		D		

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑			↑↑↑	↱	↰	↟				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.83	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	5085			4638	1583	1681	1449	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	5085			4638	1583	1681	1449	1504			
Volume (vph)	82	1042	0	0	1274	409	645	2	1307	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1097	0	0	1341	431	679	2	1460	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	293	0	71	26	0	0	0
Lane Group Flow (vph)	86	1097	0	0	1341	138	647	682	715	0	0	0
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	16.5	47.0			32.0	32.0	38.0	38.0	45.0			
Effective Green, g (s)	16.0	47.0			32.0	32.0	38.0	38.0	45.0			
Actuated g/C Ratio	0.16	0.47			0.32	0.32	0.38	0.38	0.45			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	319	2390			1484	507	639	551	677			
v/s Ratio Prot	0.05	c0.22			c0.29		0.38	c0.47	c0.48			
v/s Ratio Perm						0.09						
v/c Ratio	0.27	0.46			0.90	0.27	1.01	1.24	1.06			
Uniform Delay, d1	35.3	17.9			32.5	25.3	31.0	31.0	27.5			
Progression Factor	0.76	0.46			0.53	0.32	1.00	1.00	1.00			
Incremental Delay, d2	1.7	0.5			7.2	1.0	38.8	121.7	50.2			
Delay (s)	28.5	8.8			24.4	9.1	69.8	152.7	77.7			
Level of Service	C	A			C	A	E	F	E			
Approach Delay (s)		10.2			20.7			101.7			0.0	
Approach LOS		B			C			F			A	

Intersection Summary			
HCM Average Control Delay	52.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑	↱	↰	↟	↱	↰	↟	↱		↟	↱↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1790	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3433	3390	1441	1770	3539	1583	1681	1696	1583		1790	2628
Volume (vph)	494	1601	334	75	843	171	42	3	42	202	45	804
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	494	1601	334	75	843	171	42	3	42	202	45	804
RTOR Reduction (vph)	0	0	145	0	0	31	0	0	39	0	0	194
Lane Group Flow (vph)	494	1601	189	75	843	140	42	3	3	0	247	610
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	20.5	41.2	52.2	6.8	26.5	26.5	7.5	7.5	7.5		30.5	51.0
Effective Green, g (s)	20.0	40.7	51.7	6.3	27.0	27.0	7.0	7.0	7.0		30.0	50.0
Actuated g/C Ratio	0.20	0.41	0.52	0.06	0.27	0.27	0.07	0.07	0.07		0.30	0.50
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	687	1380	745	112	956	427	118	119	111		537	1314
v/s Ratio Prot	0.14	c0.47	c0.13	0.04	c0.24		0.01	0.01			0.14	c0.23
v/s Ratio Perm						0.09			0.00			
v/c Ratio	0.72	1.16	0.25	0.67	0.88	0.33	0.19	0.19	0.03		0.46	0.46
Uniform Delay, d1	37.4	29.8	13.4	45.8	35.0	29.2	43.8	43.8	43.3		28.4	16.3
Progression Factor	1.00	0.64	0.39	1.00	1.00	1.00	1.00	1.00	1.00		1.32	1.44
Incremental Delay, d2	3.3	76.6	0.1	11.2	11.5	2.0	0.6	0.6	0.1		2.1	0.9
Delay (s)	43.7	95.0	5.3	57.0	46.5	31.3	44.4	44.4	43.4		39.6	24.4
Level of Service	D	F	A	E	D	C	D	D	D		D	C
Approach Delay (s)		72.6			44.6			43.9			27.9	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM Average Control Delay	55.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↟↑	↱↱					↑↑			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3310	2787					3531			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3310	2787					3531			1863	
Volume (vph)	65	29	221	0	0	0	0	541	9	0	187	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	31	233	0	0	0	0	569	9	0	197	0
RTOR Reduction (vph)	0	0	149	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	29	60	84	0	0	0	0	577	0	0	197	0
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	28.0	28.0	36.5					65.0			56.5	
Effective Green, g (s)	27.5	27.5	36.0					64.5			56.0	
Actuated g/C Ratio	0.28	0.28	0.36					0.64			0.56	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	443	910	1003					2277			1043	
v/s Ratio Prot	0.02	0.02	c0.03					c0.16			0.11	
v/s Ratio Perm												
v/c Ratio	0.07	0.07	0.08					0.25			0.19	
Uniform Delay, d1	26.8	26.8	21.1					7.5			10.8	
Progression Factor	0.90	0.90	0.90					1.00			1.10	
Incremental Delay, d2	0.3	0.1	0.0					0.3			0.4	
Delay (s)	24.6	24.4	19.1					7.8			12.3	
Level of Service	C	C	B					A			B	
Approach Delay (s)		21.1			0.0			7.8			12.3	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3337		1770	3485		1770	1839		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3337		1770	3485		1770	1839		1770	1863	1583
Volume (vph)	405	504	312	36	568	63	337	272	26	30	291	109
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	531	328	38	598	66	355	286	27	32	306	115
RTOR Reduction (vph)	0	86	0	0	8	0	0	3	0	0	0	93
Lane Group Flow (vph)	426	773	0	38	643	0	355	310	0	32	306	22
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	20.6	37.3		5.7	22.5		22.5	22.5		19.5	19.5	19.5
Effective Green, g (s)	20.0	37.8		5.2	23.0		22.0	22.0		19.0	19.0	19.0
Actuated g/C Ratio	0.20	0.38		0.05	0.23		0.22	0.22		0.19	0.19	0.19
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	354	1261		92	802		389	405		336	354	301
v/s Ratio Prot	c0.24	0.23		0.02	c0.18		c0.20	0.17		0.02	c0.16	
v/s Ratio Perm												0.01
v/c Ratio	1.20	0.61		0.41	0.80		0.91	0.77		0.10	0.86	0.07
Uniform Delay, d1	40.0	25.2		45.9	36.3		38.1	36.6		33.4	39.3	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.02	1.01		0.75	0.80	1.33
Incremental Delay, d2	115.4	2.2		3.0	6.3		25.1	8.3		0.1	17.7	0.1
Delay (s)	155.4	27.4		48.9	44.6		63.8	45.4		25.1	49.1	44.2
Level of Service	F	C		D	D		E	D		C	D	D
Approach Delay (s)		69.8			44.9			55.2			46.2	
Approach LOS		E			D			E			D	

Intersection Summary				
HCM Average Control Delay	57.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	87.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3389		1770	3518		1770	3497		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3389		1770	3518		1770	3497		1770	3487	
Volume (vph)	103	324	127	105	532	22	126	705	62	49	892	98
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	341	134	111	560	23	132	743	65	52	939	103
RTOR Reduction (vph)	0	44	0	0	3	0	0	5	0	0	7	0
Lane Group Flow (vph)	108	431	0	111	580	0	132	803	0	52	1035	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	18.7		10.8	21.5		12.5	48.3		7.2	43.0	
Effective Green, g (s)	7.0	19.2		9.8	22.0		11.5	48.8		6.2	43.5	
Actuated g/C Ratio	0.07	0.19		0.10	0.22		0.12	0.49		0.06	0.44	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	124	651		173	774		204	1707		110	1517	
v/s Ratio Prot	c0.06	0.13		0.06	c0.16		c0.07	0.23		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.87	0.66		0.64	0.75		0.65	0.47		0.47	0.68	
Uniform Delay, d1	46.1	37.4		43.4	36.4		42.3	17.0		45.3	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	44.1	2.5		7.9	4.0		6.9	0.9		3.2	2.5	
Delay (s)	90.2	39.9		51.3	40.4		49.2	17.9		48.5	25.2	
Level of Service	F	D		D	D		D	B		D	C	
Approach Delay (s)		49.2			42.2			22.3			28.3	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	32.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	69.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.96			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	1834			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3418		1770	3539	1583	1770	1834			1819	
Volume (vph)	25	292	86	83	417	324	117	375	43	99	143	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	307	91	87	439	341	123	395	45	101	151	9
RTOR Reduction (vph)	0	24	0	0	0	212	0	4	0	0	2	0
Lane Group Flow (vph)	26	374	0	87	439	129	123	436	0	0	259	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.1	33.0		7.8	37.7	37.7	26.0	26.0			18.7	
Effective Green, g (s)	2.6	33.0		7.3	37.7	37.7	25.5	25.5			18.2	
Actuated g/C Ratio	0.03	0.33		0.07	0.38	0.38	0.26	0.26			0.18	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	46	1128		129	1334	597	451	468			331	
v/s Ratio Prot	0.01	0.11		c0.05	c0.12		0.07	c0.24			c0.14	
v/s Ratio Perm						0.08						
v/c Ratio	0.57	0.33		0.67	0.33	0.22	0.27	0.93			0.78	
Uniform Delay, d1	48.1	25.2		45.2	22.2	21.1	29.8	36.4			39.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	12.3	0.8		11.9	0.7	0.8	0.2	25.3			11.1	
Delay (s)	60.4	26.0		57.1	22.8	21.9	30.1	61.7			50.1	
Level of Service	E	C		E	C	C	C	E			D	
Approach Delay (s)		28.1			25.9			54.8			50.1	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	37.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3539	1583	1770	1863	1583	1770	1852	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3455		1770	3539	1583	1770	1863	1583	1770	1852	
Volume (vph)	28	355	67	57	770	245	143	334	40	179	258	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	374	71	60	811	258	151	352	42	188	289	11
RTOR Reduction (vph)	0	13	0	0	0	138	0	0	31	0	2	0
Lane Group Flow (vph)	29	432	0	60	811	120	151	352	11	188	278	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	4.5	44.0		7.1	46.6	46.6	12.6	25.9	25.9	8.5	21.8	
Effective Green, g (s)	4.0	44.0		6.6	46.6	46.6	12.1	25.4	25.4	8.0	21.3	
Actuated g/C Ratio	0.04	0.44		0.07	0.47	0.47	0.12	0.25	0.25	0.08	0.21	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	71	1520		117	1649	738	214	473	402	142	394	
v/s Ratio Prot	0.02	0.13		c0.03	c0.23		c0.09	c0.19		c0.11	0.15	
v/s Ratio Perm						0.08			0.01			
v/c Ratio	0.41	0.28		0.51	0.49	0.16	0.71	0.74	0.03	1.32	0.71	
Uniform Delay, d1	46.8	17.9		45.1	18.5	15.4	42.2	34.3	28.0	46.0	36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.84	
Incremental Delay, d2	2.8	0.5		2.8	1.1	0.5	9.4	5.9	0.0	183.3	4.8	
Delay (s)	49.6	18.4		48.0	19.5	15.9	51.6	40.2	28.0	230.3	35.5	
Level of Service	D	B		D	B	B	D	D	C	F	D	
Approach Delay (s)		20.3			20.2			42.5			113.8	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM Average Control Delay	41.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	531	16	90	1048	24	26	13	74	2	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	559	17	95	1103	25	27	14	78	2	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1128			576			1364	1938	288	1722	1934	564
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1128			576			1364	1938	288	1722	1934	564
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			90			70	76	89	94	94	100
cM capacity (veh/h)	616			994			91	56	709	87	56	469

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	373	203	95	735	393	34	85	6
Volume Left	26	0	0	95	0	0	27	0	2
Volume Right	0	0	17	0	0	25	0	78	1
cSH	615	1700	1700	994	1700	1700	81	365	55
Volume to Capacity	0.04	0.22	0.12	0.10	0.43	0.23	0.42	0.23	0.11
Queue Length 95th (ft)	3	0	0	8	0	0	42	22	9
Control Delay (s)	11.1	0.0	0.0	9.0	0.0	0.0	78.5	17.6	78.5
Lane LOS	B			A			F	C	F
Approach Delay (s)	0.5			0.7			35.3		78.5
Approach LOS							E		F

Intersection Summary					
Average Delay	3.0				
Intersection Capacity Utilization	47.1%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1770	3463		1770	3507			1810	1583		1809	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.77	
Satd. Flow (perm)	1770	3463		1770	3507			1810	1583		1408	
Volume (vph)	3	512	86	122	850	54	244	176	121	17	32	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	539	91	128	895	57	257	187	127	18	34	6
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	64	0	5	0
Lane Group Flow (vph)	3	618	0	128	948	0	0	444	63	0	53	0
Turn Type	Prot			Prot			Split		Perm	Perm		
Protected Phases	1	6		5	2		7	7		8		
Permitted Phases									7	8		
Actuated Green, G (s)	0.9	39.1		11.1	49.3			26.5	26.5		8.8	
Effective Green, g (s)	0.4	39.1		10.6	49.3			26.0	26.0		8.3	
Actuated g/C Ratio	0.00	0.89		0.11	0.49			0.26	0.26		0.08	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	7	1354		188	1729			471	412		117	
v/s Ratio Prot	0.00	c0.18		c0.07	c0.27			c0.25				
v/s Ratio Perm									0.04		c0.04	
v/c Ratio	0.43	0.46		0.68	0.55			0.94	0.15		0.46	
Uniform Delay, d1	49.7	22.6		43.1	17.6			38.3	28.5		43.7	
Progression Factor	1.00	1.00		0.96	0.60			1.00	1.00		1.00	
Incremental Delay, d2	27.8	1.1		4.5	0.6			27.5	0.1		2.1	
Delay (s)	77.5	23.7		46.6	11.1			63.8	28.6		45.8	
Level of Service	E	C		D	B			E	C		D	
Approach Delay (s)		23.9			15.3			56.0			45.8	
Approach LOS		C			B			E			D	

Intersection Summary					
HCM Average Control Delay	28.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.65				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	68.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3360		1770	3392		3433	3535		1770	3509	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3360		1770	3392		3433	3535		1770	3509	
Volume (vph)	98	365	185	92	580	225	371	981	6	166	1018	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	384	195	94	611	237	391	1012	6	175	1072	64
RTOR Reduction (vph)	0	63	0	0	36	0	0	1	0	0	5	0
Lane Group Flow (vph)	103	516	0	94	820	0	391	1019	0	175	1131	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	31.1		7.1	29.2		15.0	35.2		13.6	33.8	
Effective Green, g (s)	8.0	30.1		6.1	28.2		14.0	35.2		12.6	33.8	
Actuated g/C Ratio	0.08	0.30		0.06	0.28		0.14	0.35		0.13	0.34	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	142	1011		108	957		481	1244		223	1186	
v/s Ratio Prot	c0.06	0.16		0.02	c0.24		0.11	c0.29		0.10	c0.32	
v/s Ratio Perm												
v/c Ratio	0.73	0.51		0.31	0.86		0.81	0.82		0.78	0.95	
Uniform Delay, d1	44.9	28.9		44.9	34.0		41.7	29.5		42.4	32.3	
Progression Factor	1.50	1.28		1.12	1.05		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.3		0.6	6.8		9.6	6.1		15.3	17.2	
Delay (s)	80.9	37.1		51.1	42.7		51.3	35.6		51.6	49.5	
Level of Service	F	D		D	D		D	D		E	D	
Approach Delay (s)		43.7			43.0			40.0			50.6	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	44.4	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	82.9%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3506		1770	3500			3410			3406	
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.85	
Satd. Flow (perm)	1770	3506		1770	3500			3169			2905	
Volume (vph)	60	458	30	111	743	60	10	165	52	70	743	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	482	32	117	782	63	11	174	55	74	782	79
RTOR Reduction (vph)	0	9	0	0	10	0	0	45	0	0	42	0
Lane Group Flow (vph)	61	505	0	117	835	0	0	195	0	0	867	0
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	2.9	24.6		5.2	26.9			9.2			9.2	
Effective Green, g (s)	2.4	24.6		4.7	26.9			8.7			8.7	
Actuated g/C Ratio	0.05	0.49		0.09	0.54			0.17			0.17	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1725		166	1883			551			505	
v/s Ratio Prot	0.03	0.14		c0.07	c0.24							
v/s Ratio Perm								0.06			c0.13	
v/c Ratio	0.72	0.29		0.70	0.44			0.35			0.78	
Uniform Delay, d1	23.6	7.5		22.0	7.0			18.2			19.5	
Progression Factor	0.83	1.15		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.7	0.4		10.6	0.8			0.4			5.2	
Delay (s)	38.1	9.0		32.5	7.8			18.6			24.7	
Level of Service	D	A		C	A			B			C	
Approach Delay (s)		12.1			10.8			18.6			24.7	
Approach LOS		B			B			B			C	

Intersection Summary					
HCM Average Control Delay	14.6	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.50				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	55.8%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰			↰			↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	1.00		0.94			0.95			0.89	
Flt Protected		0.95	1.00		1.00			0.99			0.99	
Satd. Flow (prot)		1770	1854		1738			1728			1643	
Flt Permitted		0.44	1.00		0.98			0.92			0.95	
Satd. Flow (perm)		819	1854		1714			1620			1566	
Volume (vph)	468	58	2	8	83	84	2	1	2	49	4	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	493	61	2	8	87	88	2	1	2	52	4	256
RTOR Reduction (vph)	0	1	0	0	63	0	0	2	0	0	197	0
Lane Group Flow (vph)	493	62	0	0	120	0	0	3	0	0	115	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.8	20.8			6.5			6.6			6.6	
Effective Green, g (s)	20.8	20.8			6.5			6.6			6.6	
Actuated g/C Ratio	0.56	0.56			0.17			0.23			0.23	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	717	1031			298			373			360	
v/s Ratio Prot	c0.19	0.03										
v/s Ratio Perm	c0.19				0.07			0.00			c0.07	
v/c Ratio	0.69	0.06			0.40			0.01			0.32	
Uniform Delay, d1	5.9	3.8			13.7			11.1			12.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	2.8	0.0			0.9			0.0			0.5	
Delay (s)	8.6	3.8			14.6			11.1			12.5	
Level of Service	A	A			B			B			B	
Approach Delay (s)		8.1			14.6			11.1			12.5	
Approach LOS		A			B			B			B	

Intersection Summary				
HCM Average Control Delay	10.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			↰	↱		↰			↰	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.91			1.00	0.85		0.98			0.96	
Flt Protected	0.95	1.00			0.98	1.00		0.99			1.00	
Satd. Flow (prot)	1770	1692			1790	1583		1818			1788	
Flt Permitted	0.95	1.00			0.96	1.00		0.92			0.96	
Satd. Flow (perm)	1770	1692			1790	1583		1686			1755	
Volume (vph)	175	40	63	160	40	18	77	447	79	10	196	82
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.85	0.95	0.95
Adj. Flow (vph)	184	42	66	168	42	19	81	471	83	11	206	86
RTOR Reduction (vph)	0	57	0	0	0	16	0	4	0	0	12	0
Lane Group Flow (vph)	184	51	0	0	220	3	0	631	0	0	291	0
Turn Type	Split			Split			Perm	Perm			Perm	
Protected Phases	3	3		4	4			6			2	
Permitted Phases							4			2		
Actuated Green, G (s)	9.3	9.3			11.7	11.7		33.1			33.1	
Effective Green, g (s)	8.3	8.3			10.7	10.7		32.1			32.1	
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.51			0.51	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	233	223			304	268		858			893	
v/s Ratio Prot	c0.10	0.03			c0.12							
v/s Ratio Perm						0.00		c0.37			0.17	
v/c Ratio	0.79	0.23			0.72	0.01		0.73			0.33	
Uniform Delay, d1	26.6	24.5			24.8	21.8		12.2			9.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	15.0	0.2			7.0	0.0		2.8			0.1	
Delay (s)	41.6	24.7			31.8	21.8		15.0			9.2	
Level of Service	D	C			C	C		B			A	
Approach Delay (s)		35.3			31.0			15.0			9.2	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	78.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑			↰↑			↰↑			↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3469			3468			3510			3494	
Flt Permitted		0.74			0.99			1.00			1.00	
Satd. Flow (perm)		2585			3468			3510			3494	
Volume (vph)	77	193	12	112	289	20	0	1237	72	0	1134	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	203	13	118	304	21	0	1302	76	0	1194	111
RTOR Reduction (vph)	0	3	0	0	3	0	0	4	0	0	8	0
Lane Group Flow (vph)	0	294	0	0	440	0	0	1374	0	0	1299	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		13.5			16.3			59.2			59.2	
Effective Green, g (s)		14.5			17.3			61.2			61.2	
Actuated g/C Ratio		0.14			0.18			0.58			0.58	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		357			571			2046			2037	
v/s Ratio Prot					c0.13			c0.39			0.37	
v/s Ratio Perm		c0.11										
v/c Ratio		0.82			0.77			0.67			0.64	
Uniform Delay, d1		44.0			41.9			15.0			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.5			5.6			1.8			1.5	
Delay (s)		57.6			47.6			16.8			16.1	
Level of Service		E			D			B			B	
Approach Delay (s)		57.5			47.6			16.8			16.1	
Approach LOS		E			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱		↰↑			↰↑↑↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0			4.0	
Lane Util. Factor					0.95	1.00		0.95			0.91	
Frt					1.00	0.85		1.00			1.00	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3523	1583		3536			5077	
Flt Permitted					1.00	1.00		0.92			1.00	
Satd. Flow (perm)					3523	1583		3256			5077	
Volume (vph)	0	0	0	65	656	814	12	646	0	0	1180	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	68	691	857	13	680	0	0	1242	13
RTOR Reduction (vph)	0	0	0	0	0	137	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	759	720	0	693	0	0	1254	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					37.0	37.0		54.0			54.0	
Effective Green, g (s)					37.0	37.0		55.0			55.0	
Actuated g/C Ratio					0.37	0.37		0.55			0.55	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1304	586		1791			2792	
v/s Ratio Prot					0.22						c0.25	
v/s Ratio Perm						c0.45		0.21				
v/c Ratio					0.58	1.23		0.39			0.45	
Uniform Delay, d1					25.3	31.5		12.9			13.4	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.4	117.6		0.6			0.5	
Delay (s)					25.7	149.1		13.5			14.0	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			91.1			13.5			14.0	
Approach LOS		A			F			B			B	

Intersection Summary				
HCM Average Control Delay	48.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	76.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3465						3498		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3465						3498		3433	3539	
Volume (vph)	16	442	47	0	0	0	0	640	54	532	681	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	465	49	0	0	0	0	674	57	560	717	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	0	0	0	724	0	560	717	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		13.7						29.3		12.0	47.3	
Effective Green, g (s)		14.7						30.3		13.0	47.3	
Actuated g/C Ratio		0.21						0.43		0.19	0.68	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		732						1514		638	2391	
v/s Ratio Prot		c0.15						c0.21		c0.16	0.20	
v/s Ratio Perm												
v/c Ratio		0.71						0.48		0.88	0.30	
Uniform Delay, d1		25.6						14.2		27.7	4.6	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		2.5						1.1		12.6	0.0	
Delay (s)		28.2						15.3		40.3	4.6	
Level of Service		C						B		D	A	
Approach Delay (s)		28.2			0.0			15.3			20.3	
Approach LOS		C			A			B			C	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			1.00			1.00	
Flt Protected		0.95			0.95			0.95			0.95	
Satd. Flow (prot)		1770			1770			1770			1770	
Flt Permitted		0.95			0.95			0.95			0.95	
Satd. Flow (perm)		1770			1770			1770			1770	
Volume (vph)	300	794	213	148	903	76	211	520	140	151	387	506
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	836	224	156	951	80	222	547	147	159	407	533
RTOR Reduction (vph)	0	22	0	0	6	0	0	22	0	0	0	290
Lane Group Flow (vph)	316	1038	0	156	1025	0	222	672	0	159	407	243
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	21.3	36.2		12.8	29.7		20.0	20.0		22.0	22.0	22.0
Effective Green, g (s)	21.3	39.2		12.8	30.7		20.0	20.0		22.0	22.0	22.0
Actuated g/C Ratio	0.19	0.36		0.12	0.28		0.18	0.18		0.20	0.20	0.20
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0		2.5	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	343	1221		205	976		322	623		354	373	317
v/s Ratio Prot	c0.18	0.30		0.09	c0.29		0.13	c0.20		0.09	c0.22	
v/s Ratio Perm												0.15
v/c Ratio	0.92	0.85		0.76	1.05		0.69	1.08		0.45	1.09	0.77
Uniform Delay, d1	43.5	32.7		47.1	39.6		42.1	45.0		38.7	44.0	41.6
Progression Factor	1.00	1.00		1.18	0.91		1.00	1.01		1.00	1.00	1.00
Incremental Delay, d2	29.3	7.5		1.5	25.7		4.3	56.0		0.9	73.3	10.5
Delay (s)	72.8	40.2		57.1	61.0		46.4	100.5		39.6	117.3	52.1
Level of Service	E	D		E	E		D	F		D	F	D
Approach Delay (s)		47.7			61.2			87.4			74.4	
Approach LOS		D			E			F			E	

Intersection Summary				
HCM Average Control Delay	65.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	89.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑			↕		↰	↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96			0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3382			3438		1770	3481		1770	3459	
Flt Permitted	0.16	1.00			0.58		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	292	3382			2017		1770	3481		1770	3459	
Volume (vph)	202	664	286	101	702	149	279	1278	159	191	1140	202
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	720	303	106	739	157	294	1345	167	201	1200	213
RTOR Reduction (vph)	0	42	0	0	14	0	0	9	0	0	13	0
Lane Group Flow (vph)	213	981	0	0	986	0	294	1503	0	201	1400	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	48.0	48.0			48.0		17.0	34.0		15.0	32.0	
Effective Green, g (s)	48.0	48.0			48.0		17.0	35.0		15.0	33.0	
Actuated g/C Ratio	0.44	0.44			0.44		0.15	0.32		0.14	0.30	
Clearance Time (s)	4.0	4.0			4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	127	1478			880		274	1108		241	1038	
v/s Ratio Prot		0.29					0.17	c0.43		0.11	c0.40	
v/s Ratio Perm	c0.73				0.49							
v/c Ratio	1.68	0.66			1.12		1.07	1.36		0.83	1.35	
Uniform Delay, d1	31.0	24.8			31.0		46.5	37.5		46.3	38.5	
Progression Factor	1.00	1.06			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	325.2	0.7			70.0		75.1	166.4		21.3	163.3	
Delay (s)	358.9	27.3			101.0		121.8	203.9		67.6	201.8	
Level of Service	F	C			F		F	F		E	F	
Approach Delay (s)		84.4			101.0			190.6			185.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	149.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	122.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	19	0	187	17	0	2	1	198	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	20	0	197	18	0	2	1	208	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					521							
pX, platoon unblocked												
vC, conflicting volume	18				20			434	434	20	643	434	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	18				20			434	434	20	643	434	18
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100				88			100	100	80	100	100	100
cM capacity (veh/h)	1599				1596			461	451	1058	280	451	1061

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	215	212	2
Volume Left	1	197	2	1
Volume Right	0	0	208	0
cSH	1599	1596	1038	346
Volume to Capacity	0.00	0.12	0.20	0.01
Queue Length 95th (ft)	0	11	19	0
Control Delay (s)	0.4	7.0	9.4	15.5
Lane LOS	A	A	A	C
Approach Delay (s)	0.4	7.0	9.4	15.5
Approach LOS			A	C

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		↟			↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.99		1.00	0.88		0.94			1.00	0.97
Flt Protected		0.95	1.00		0.95	1.00					0.95	1.00
Satd. Flow (prot)		1770	1844		1770	1632		1759			1770	1811
Flt Permitted		0.19	1.00		0.70	1.00		0.99			0.16	1.00
Satd. Flow (perm)		348	1844		1303	1632		1745			292	1811
Volume (vph)	158	79	6	205	106	501	10	447	315	93	484	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	166	83	6	216	112	527	11	471	333	98	509	116
RTOR Reduction (vph)	0	4	0	0	225	0	0	41	0	0	14	0
Lane Group Flow (vph)	166	85	0	216	414	0	0	774	0	98	611	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	21.9	21.9		21.9	21.9			23.9		31.1	31.1	
Effective Green, g (s)	21.4	21.4		21.4	21.4			23.4		30.6	30.6	
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.39		0.51	0.51	
Clearance Time (s)	3.5	3.5		3.5	3.5			3.5		4.0	3.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	124	658		465	582			681		228	924	
v/s Ratio Prot		0.05			0.26					0.02	c0.34	
v/s Ratio Perm	c0.48			0.17				c0.44		0.20		
v/c Ratio	1.34	0.13		0.46	0.71			1.14		0.43	0.66	
Uniform Delay, d1	19.3	13.0		14.9	16.6			18.3		11.7	10.9	
Progression Factor	1.00	1.00		0.90	0.92			1.00		1.00	1.00	
Incremental Delay, d2	196.8	0.4		2.9	6.5			78.4		1.3	1.8	
Delay (s)	216.1	13.4		16.4	21.8			96.7		13.0	12.7	
Level of Service	F	B		B	C			F		B	B	
Approach Delay (s)		145.4			20.5			96.7			12.7	
Approach LOS		F			C			F			B	

Intersection Summary			
HCM Average Control Delay	53.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	119.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1005: 65th St & Overland Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱		↰	↟		↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1852		1770	1863	1759	
Flt Permitted	1.00		0.38	1.00	0.96	
Satd. Flow (perm)	1852		706	1863	1759	
Volume (vph)	466	21	37	425	388	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	493	22	39	447	408	45
RTOR Reduction (vph)	2	0	0	0	8	0
Lane Group Flow (vph)	513	0	39	447	445	0
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	33.9		33.9	33.9	19.1	
Effective Green, g (s)	33.4		33.4	33.4	18.6	
Actuated g/C Ratio	0.56		0.56	0.56	0.31	
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1031		393	1037	545	
v/s Ratio Prot	c0.28			0.24	c0.25	
v/s Ratio Perm			0.06			
v/c Ratio	0.50		0.10	0.43	0.82	
Uniform Delay, d1	8.2		6.2	7.8	19.1	
Progression Factor	0.78		1.00	1.00	1.00	
Incremental Delay, d2	0.9		0.5	1.3	9.2	
Delay (s)	7.3		6.7	9.1	28.3	
Level of Service	A		A	A	C	
Approach Delay (s)	7.3			8.9	28.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1006: 65th St & Hollis St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↟			↟			↰	↱		↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	0.99
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.96			0.99			1.00	0.99		1.00	0.95
Flt Protected		0.96			0.99			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1778			1811			1770	1843		1770	1748
Flt Permitted		0.77			0.87			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1390			1587			1770	1843		1770	1748
Volume (vph)	225	255	68	36	137	20	163	712	44	19	404	204
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	268	72	38	144	21	172	749	46	20	425	215
RTOR Reduction (vph)	0	9	0	0	8	0	0	3	0	0	33	0
Lane Group Flow (vph)	0	568	0	0	195	0	172	792	0	20	607	0
Confl. Peds. (#/hr)	14		4	4		14			5			20
Confl. Bikes (#/hr)			4			2			4			11
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			4		5	2		1	6	
Permitted Phases	8			4								
Actuated Green, G (s)		16.5			16.5		7.4	25.8		1.4	19.6	
Effective Green, g (s)		16.0			16.0		6.9	26.1		0.9	20.1	
Actuated g/C Ratio		0.29			0.29		0.13	0.47		0.02	0.37	
Clearance Time (s)		3.5			3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)		2.5			2.5		2.5	3.0		2.5	2.0	
Lane Grp Cap (vph)		404			462		222	675		29	639	
v/s Ratio Prot							c0.10	c0.43		0.01	0.35	
v/s Ratio Perm		c0.41			0.12							
v/c Ratio		1.41			0.42		0.77	0.90		0.69	0.95	
Uniform Delay, d1		19.5			15.8		23.3	13.3		26.9	17.0	
Progression Factor		1.00			1.00		0.91	1.07		0.99	1.12	
Incremental Delay, d2		196.8			0.5		13.4	13.3		39.8	21.7	
Delay (s)		216.3			16.2		34.7	27.5		66.4	40.7	
Level of Service		F			B		C	C		E	D	
Approach Delay (s)		216.3			16.2			28.8			41.5	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	76.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th St & Christie Ave

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	14	59	115	0	11	17	202	67	5	183	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	15	62	121	0	12	18	213	71	5	193	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	81	133	301	199								
Volume Left (vph)	4	121	18	5								
Volume Right (vph)	62	12	71	1								
Hadj (s)	0.42	0.16	-0.09	0.04								
Departure Headway (s)	4.9	5.4	4.6	4.9								
Degree Utilization, x	0.11	0.20	0.39	0.27								
Capacity (veh/h)	645	604	741	692								
Control Delay (s)	8.5	9.7	10.6	9.7								
Approach Delay (s)	8.5	9.7	10.6	9.7								
Approach LOS	A	A	B	A								

Intersection Summary			
Delay	9.9		
HCM Level of Service	A		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	120	47	25	643	568	134
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	49	26	677	598	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					654	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	1396	666	737			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1481	595	680			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	88	96			
cM capacity (veh/h)	110	415	751			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	176	26	677	737
Volume Left	126	26	0	0
Volume Right	49	0	0	141
cSH	138	751	1700	1700
Volume to Capacity	1.27	0.04	0.40	0.43
Queue Length 95th (ft)	270	3	0	0
Control Delay (s)	228.3	10.0	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	228.3	0.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	25.0		
Intersection Capacity Utilization	64.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.92		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.96		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1798	1583	1681	1660		1770	3539	1452		3482	
Flt Permitted		0.97	1.00	0.95	0.96		0.22	1.00	1.00		0.93	
Satd. Flow (perm)		1798	1583	1681	1660		413	3539	1452		3260	
Volume (vph)	12	5	95	861	63	53	130	375	325	22	650	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	5	100	906	66	56	137	395	342	23	684	71
RTOR Reduction (vph)	0	0	78	0	4	0	0	0	211	0	7	0
Lane Group Flow (vph)	0	18	22	528	496	0	137	395	131	0	771	0
Confl. Peds. (#/hr)						25			19	19		
Confl. Bikes (#/hr)						2			3			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		7.1	7.1	49.2	49.2		42.7	42.7	42.7		42.7	
Effective Green, g (s)		6.6	6.6	49.2	49.2		42.2	42.2	42.2		42.2	
Actuated g/C Ratio		0.06	0.06	0.45	0.45		0.38	0.38	0.38		0.38	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		108	95	752	742		158	1358	557		1251	
v/s Ratio Prot		0.01		c0.31	0.30			0.11				
v/s Ratio Perm			c0.01				c0.33		0.09		0.24	
v/c Ratio		0.17	0.23	0.70	0.67		0.87	0.29	0.24		0.62	
Uniform Delay, d1		49.1	49.3	24.5	24.0		31.3	23.5	23.0		27.4	
Progression Factor		1.00	1.00	0.32	0.30		1.20	0.89	2.88		1.00	
Incremental Delay, d2		0.5	0.9	4.0	3.5		26.4	0.3	0.5		2.3	
Delay (s)		49.6	50.2	11.7	10.8		63.9	21.2	66.8		29.6	
Level of Service		D	D	B	B		E	C	E		C	
Approach Delay (s)		50.1			11.2			45.6			29.6	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	311	34	474	664	329	503
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	327	36	499	720	346	529
RTOR Reduction (vph)	0	18	0	0	0	176
Lane Group Flow (vph)	327	18	499	720	346	353
Confl. Peds. (#/hr)		4				23
Confl. Bikes (#/hr)						7
Turn Type		pt+ov	Prot			Over
Protected Phases	4	4 5	5	2	6	4
Permitted Phases						
Actuated Green, G (s)	26.6	54.6	24.5	76.4	48.4	26.6
Effective Green, g (s)	26.1	54.1	24.0	75.9	47.9	26.1
Actuated g/C Ratio	0.24	0.49	0.22	0.69	0.44	0.24
Clearance Time (s)	3.5		3.5	3.5	3.5	3.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	420	779	749	1265	811	376
v/s Ratio Prot	0.18	0.01	c0.15	c0.39	0.19	c0.22
v/s Ratio Perm						
v/c Ratio	0.78	0.02	0.67	0.56	0.43	0.94
Uniform Delay, d1	39.2	14.4	39.3	8.6	21.5	41.2
Progression Factor	0.67	0.47	0.75	0.29	1.00	1.00
Incremental Delay, d2	8.1	0.0	1.9	1.5	1.6	30.7
Delay (s)	34.5	6.8	31.3	4.0	23.2	71.9
Level of Service	C	A	C	A	C	E
Approach Delay (s)	31.6			15.2	52.6	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Flt Permitted	0.95	1.00	1.00	0.95	0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1689		1770	3539	1583	1770	1829	
Volume (vph)	172	370	60	698	14	0	11	734	1668	289	595	47
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	389	63	629	15	0	12	773	1756	283	626	49
RTOR Reduction (vph)	0	0	18	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	181	389	45	315	329	0	12	773	1756	283	673	0
Confl. Peds. (#/hr)												33
Confl. Bikes (#/hr)												16
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	16.2	16.2	16.2	21.0	21.0		1.2	24.4	94.7	17.6	40.8	
Effective Green, g (s)	15.7	15.7	15.7	21.0	21.0		0.7	24.9	94.7	17.1	41.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.22		0.01	0.26	1.00	0.18	0.44	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	293	309	262	373	375		13	931	1583	320	798	
v/s Ratio Prot	0.10	0.21		0.19	0.19		0.01	0.22		0.16	0.37	
v/s Ratio Perm			0.03						c1.11			
v/c Ratio	0.62	1.26	0.17	0.84	0.88		0.92	0.83	1.11	0.88	0.84	
Uniform Delay, d1	36.7	39.5	33.9	35.3	35.6		47.0	32.9	47.4	37.8	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	140.1	0.1	15.7	19.8		205.3	6.2	58.8	23.3	8.0	
Delay (s)	39.4	179.8	34.0	51.0	55.5		252.2	39.2	106.2	61.1	31.8	
Level of Service	D	F	C	D	E		F	D	F	E	C	
Approach Delay (s)		125.0			53.3			65.5			40.5	
Approach LOS		F			D			F			D	

Intersection Summary			
HCM Average Control Delay	77.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.95	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.91			0.91	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3229			2926	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3229			2926	1399				3433		1583
Volume (vph)	142	429	603	0	569	2170	0	0	0	951	0	343
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	452	635	0	599	2284	0	0	0	1001	0	361
RTOR Reduction (vph)	0	225	0	0	248	0	0	0	0	0	0	200
Lane Group Flow (vph)	149	862	0	0	1268	1367	0	0	0	1001	0	161
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6							4
Permitted Phases						Free				4		4
Actuated Green, G (s)	20.5	67.2			43.2	110.0				34.3		34.3
Effective Green, g (s)	20.0	67.2			43.2	110.0				34.8		34.8
Actuated g/C Ratio	0.18	0.61			0.39	1.00				0.32		0.32
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	322	1973			1149	1399				1086		501
v/s Ratio Prot	0.08	0.27			c0.43					0.29		0.10
v/s Ratio Perm						c0.98						
v/c Ratio	0.46	0.44			1.10dr	0.98				0.92		0.32
Uniform Delay, d1	40.2	11.4			33.4	0.0				36.3		28.6
Progression Factor	1.00	1.00			0.76	1.00				1.00		1.00
Incremental Delay, d2	0.4	0.7			48.2	3.7				12.5		0.3
Delay (s)	40.6	12.1			73.6	3.7				48.8		28.9
Level of Service	D	B			E	A				D		C
Approach Delay (s)		15.5			40.4			0.0		43.6		
Approach LOS		B			D			A		D		

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			0.63	1.00	0.95	0.91	0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.85	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.89	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1348	1681	1508	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1348	1681	1508	659			
Volume (vph)	153	1226	0	0	2137	605	603	226	1251	0	0	0
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	1226	0	0	2137	605	603	226	1251	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	90	10	0	0	0
Lane Group Flow (vph)	153	1226	0	0	2137	327	603	761	816	0	0	0
Confl. Peds. (#/hr)						50						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	21.5	46.0			40.0	40.0	37.0	37.0	66.0			
Effective Green, g (s)	21.0	46.0			40.0	40.0	37.0	37.0	66.0			
Actuated g/C Ratio	0.19	0.42			0.36	0.36	0.34	0.34	0.51			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	336	1489			1687	490	585	507	335			
v/s Ratio Prot	0.09	c0.34			c0.46		0.36	0.50	c0.93			
v/s Ratio Perm						0.17						
v/c Ratio	0.45	0.82			1.27	0.46	1.07	1.50	1.84			
Uniform Delay, d1	39.4	28.4			35.0	26.8	36.5	36.5	27.0			
Progression Factor	1.53	0.39			0.95	1.19	1.00	1.00	1.00			
Incremental Delay, d2	2.7	3.3			121.2	0.8	57.1	235.4	389.1			
Delay (s)	63.2	14.4			154.5	32.6	93.6	271.9	416.1			
Level of Service	E	B			F	C	F	F	F			
Approach Delay (s)		19.8			131.2			263.6			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM Average Control Delay	151.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.97	1.00
Satd. Flow (prot)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1803	2628
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.97	1.00
Satd. Flow (perm)	3433	3390	1219	1770	3539	1583	1681	1702	1583		1803	2628
Volume (vph)	541	1191	745	325	1274	300	132	16	66	328	163	1328
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	541	1191	745	325	1274	300	132	16	66	328	163	1328
RTOR Reduction (vph)	0	0	143	0	0	32	0	0	58	0	0	92
Lane Group Flow (vph)	541	1191	602	325	1274	268	72	76	8	0	491	1036
Confl. Peds. (#/hr)			25									32
Confl. Bikes (#/hr)			2									2
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	8 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	17.6	33.5	51.6	17.6	32.5	32.5	14.5	14.5	14.5		30.5	46.0
Effective Green, g (s)	17.0	33.0	51.0	17.0	33.0	33.0	14.0	14.0	14.0		30.0	47.0
Actuated g/C Ratio	0.15	0.30	0.46	0.15	0.30	0.30	0.13	0.13	0.13		0.27	0.43
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	531	1017	565	274	1062	475	214	217	201		492	1123
v/s Ratio Prot	0.16	c0.35	c0.49	0.18	c0.36		0.04	0.04			c0.27	0.39
v/s Ratio Perm						0.17			0.01			
v/c Ratio	1.02	1.17	1.07	1.19	1.20	0.56	0.34	0.35	0.04		1.00	0.92
Uniform Delay, d1	46.5	38.5	29.5	46.5	38.5	32.4	43.9	43.9	42.1		40.0	29.8
Progression Factor	1.19	1.02	1.07	1.08	1.08	1.15	1.02	1.02	2.08		0.94	0.72
Incremental Delay, d2	16.8	78.1	33.8	107.3	96.6	3.5	0.7	0.7	0.1		34.8	11.0
Delay (s)	72.0	117.3	65.4	157.4	138.4	40.7	45.5	45.6	87.7		72.4	32.6
Level of Service	E	F	E	F	F	D	D	D	F		E	C
Approach Delay (s)		91.8			126.2			58.5			44.7	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM Average Control Delay	86.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3363	2787					3526			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3363	2787					3526			1863	
Volume (vph)	121	159	784	0	0	0	0	1148	26	0	357	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	167	825	0	0	0	0	1208	28	0	376	0
RTOR Reduction (vph)	0	0	151	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	95	199	674	0	0	0	0	1233	0	0	376	0
Confl. Peds. (#/hr)			21						10			16
Confl. Bikes (#/hr)			1						3			8
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	38.0	38.0	66.5					65.0			36.5	
Effective Green, g (s)	37.5	37.5	66.0					64.5			38.0	
Actuated g/C Ratio	0.34	0.34	0.60					0.59			0.33	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	549	1146	1672					2068			610	
v/s Ratio Prot	0.06	0.06	c0.24					c0.35			0.20	
v/s Ratio Perm												
v/c Ratio	0.17	0.17	0.41					0.60			0.62	
Uniform Delay, d1	25.4	25.4	11.6					14.5			31.2	
Progression Factor	1.22	1.20	1.51					1.00			1.10	
Incremental Delay, d2	0.7	0.3	0.1					1.3			4.3	
Delay (s)	31.7	30.7	17.7					15.7			41.4	
Level of Service	C	C	B					B			D	
Approach Delay (s)		21.2			0.0			15.7			41.4	
Approach LOS		C			A			B			D	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3346		1770	3481		1770	1849		1770	1863	1540
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3346		1770	3481		1770	1849		1770	1863	1540
Volume (vph)	206	875	333	23	768	59	571	601	27	69	298	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	921	351	24	808	62	601	633	28	73	314	158
RTOR Reduction (vph)	0	35	0	0	5	0	0	1	0	0	0	126
Lane Group Flow (vph)	217	1237	0	24	865	0	601	660	0	73	314	32
Confl. Peds. (#/hr)			10			22			3			9
Confl. Bikes (#/hr)			3			5			2			3
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	10.5	29.1		3.9	22.5		39.3	39.3		22.7	22.7	22.7
Effective Green, g (s)	10.0	29.6		3.4	23.0		38.8	38.8		22.2	22.2	22.2
Actuated g/C Ratio	0.09	0.27		0.03	0.21		0.35	0.35		0.20	0.20	0.20
Clearance Time (s)	3.5	4.5		3.5	4.5		3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	161	900		55	728		624	652		357	376	311
v/s Ratio Prot	0.12	c0.37		0.01	c0.25		0.34	c0.36		0.04	c0.17	
v/s Ratio Perm												0.02
v/c Ratio	1.35	1.37		0.44	1.19		0.96	1.01		0.20	0.84	0.10
Uniform Delay, d1	50.0	40.2		52.4	43.5		34.9	35.6		36.5	42.1	35.8
Progression Factor	1.22	1.03		1.00	1.00		1.08	1.08		1.23	1.18	2.42
Incremental Delay, d2	186.0	174.2		5.5	98.3		25.1	36.3		0.2	13.0	0.1
Delay (s)	246.9	215.6		57.8	141.8		62.8	74.7		46.2	62.8	86.8
Level of Service	F	F		E	F		E	E		D	E	F
Approach Delay (s)		220.1			139.5			69.0			67.4	
Approach LOS		F			F			E			E	

Intersection Summary				
HCM Average Control Delay	137.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	99.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.89		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3434		1770	3485		1770	3494		1770	3481	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3434		1770	3485		1770	3494		1770	3481	
Volume (vph)	181	761	189	106	540	61	185	1383	129	112	1236	151
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	801	199	112	568	64	195	1456	136	118	1301	159
RTOR Reduction (vph)	0	24	0	0	10	0	0	7	0	0	10	0
Lane Group Flow (vph)	191	976	0	112	622	0	195	1586	0	118	1450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.0	25.6		6.4	22.8		13.1	31.2		9.3	28.0	
Effective Green, g (s)	10.0	26.0		7.4	23.4		12.1	31.7		8.9	28.5	
Actuated g/C Ratio	0.11	0.28		0.08	0.26		0.13	0.35		0.10	0.32	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	992		146	906		238	1231		175	1102	
v/s Ratio Prot	c0.11	c0.28		0.06	0.18		c0.11	c0.45		0.07	0.42	
v/s Ratio Perm												
v/c Ratio	0.97	0.98		0.77	0.69		0.82	1.29		0.67	1.32	
Uniform Delay, d1	39.8	31.8		40.5	30.0		37.9	29.2		39.2	30.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.60		1.00	1.00	
Incremental Delay, d2	54.6	24.5		21.1	2.2		19.3	135.6		8.8	148.5	
Delay (s)	94.5	56.2		61.6	32.2		57.2	184.8		48.0	179.3	
Level of Service	F	E		E	C		E	F		D	F	
Approach Delay (s)		62.4			36.6			153.0			169.5	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM Average Control Delay	121.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	95.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.95			1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3379		1770	3539	1518	1770	1747			1819	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3379		1770	3539	1518	1770	1747			1819	
Volume (vph)	31	720	251	158	761	107	259	344	169	259	397	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	758	264	166	801	113	273	362	178	273	418	20
RTOR Reduction (vph)	0	35	0	0	0	84	0	16	0	0	1	0
Lane Group Flow (vph)	33	987	0	166	801	29	273	522	0	0	710	0
Confl. Peds. (#/hr)			2			6			9			5
Confl. Bikes (#/hr)			1			6			3			10
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.4	23.0		7.6	26.1	26.1	27.5	27.5			27.5	
Effective Green, g (s)	3.9	23.0		7.0	26.1	26.1	27.0	27.0			27.0	
Actuated g/C Ratio	0.04	0.23		0.07	0.26	0.26	0.27	0.27			0.27	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5			3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5			2.5	
Lane Grp Cap (vph)	69	777		124	924	396	478	472			491	
v/s Ratio Prot	0.02	c0.29		c0.09	c0.23		0.15	c0.30			c0.39	
v/s Ratio Perm						0.02						
v/c Ratio	0.48	1.27		1.34	0.87	0.07	0.57	1.11			1.45	
Uniform Delay, d1	47.1	38.5		46.5	35.3	27.8	31.5	36.5			36.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2	3.8	131.9		196.8	10.8	0.4	1.4	73.9			212.2	
Delay (s)	50.8	170.4		243.3	46.0	28.2	32.9	110.4			248.7	
Level of Service	D	F		F	D	C	C	F			F	
Approach Delay (s)		166.6			74.5			84.3			248.7	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	137.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.32			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	115.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00			0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1770	3453		1770	3539	1494	1770	1863			1834	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (perm)	1770	3453		1770	3539	1494	1770	1863			1834	
Volume (vph)	46	926	142	143	794	263	219	398	133	357	591	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	977	149	151	836	277	231	417	140	376	622	54
RTOR Reduction (vph)	0	12	0	0	0	171	0	0	99	0	3	0
Lane Group Flow (vph)	48	1114	0	151	836	106	231	417	41	376	673	0
Confl. Peds. (#/hr)			19			12			11			14
Confl. Bikes (#/hr)			2			10			1			
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Actuated Green, G (s)	5.3	31.5		12.0	38.2	38.2	12.5	29.6	29.6	12.5	29.5	
Effective Green, g (s)	4.8	31.5		11.5	38.2	38.2	12.0	29.0	29.0	12.0	29.0	
Actuated g/C Ratio	0.05	0.32		0.12	0.38	0.38	0.12	0.29	0.29	0.12	0.29	
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	85	1088		204	1352	571	212	540	441	212	532	
v/s Ratio Prot	0.03	c0.32		c0.09	0.24		0.13	0.22		c0.21	c0.37	
v/s Ratio Perm						0.07			0.03			
v/c Ratio	0.56	1.02		0.74	0.62	0.19	1.09	0.77	0.09	1.77	1.27	
Uniform Delay, d1	46.6	34.2		42.8	25.0	20.8	44.0	32.5	25.9	44.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	
Incremental Delay, d2	6.8	33.6		12.8	2.1	0.7	87.8	6.5	0.1	356.3	126.0	
Delay (s)	53.4	67.8		55.6	27.1	21.3	131.8	39.0	26.0	398.3	159.6	
Level of Service	D	E		E	C	C	F	D	C	F	F	
Approach Delay (s)		67.3			29.2			63.9			244.9	
Approach LOS		E			C			E			F	

Intersection Summary				
HCM Average Control Delay	99.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1020: 40th St & Harlan St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↓↓			↓	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	1342	44	96	1218	13	33	12	96	1	8	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1413	46	101	1283	14	35	13	103	1	8	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		359			326							
pX, platoon unblocked												
vC, conflicting volume	1297			1459			2339	2981	729	2354	2997	648
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1297			1459			2339	2981	729	2354	2997	648
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			78			0	0	72	0	16	98
cM capacity (veh/h)	530			459			5	10	365	0	10	413
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1			
Volume Total	23	942	517	101	855	441	41	109	19			
Volume Left	23	0	0	101	0	0	35	0	1			
Volume Right	0	0	46	0	0	14	0	103	9			
cSH	530	1700	1700	459	1700	1700	5	122	0			
Volume to Capacity	0.04	0.55	0.30	0.22	0.50	0.26	8.10	0.90	Err			
Queue Length 95th (ft)	3	0	0	21	0	0	Err	142	Err			
Control Delay (s)	12.1	0.0	0.0	15.0	0.0	0.0	Err	123.3	Err			
Lane LOS	B			C			F	F	F			
Approach Delay (s)	0.2			1.1			2816.7		Err			
Approach LOS							F		F			
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			62.3%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↓	↱		↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	0.99			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3425		1770	3495			1814	1555		1814	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3425		1770	3495			1814	1555		1814	
Volume (vph)	32	1235	216	158	1053	61	272	237	287	30	148	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1300	227	166	1108	64	286	249	302	32	156	21
RTOR Reduction (vph)	0	12	0	0	4	0	0	0	126	0	4	0
Lane Group Flow (vph)	34	1515	0	166	1168	0	0	535	176	0	205	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases									7			
Actuated Green, G (s)	8.7	32.0		12.5	35.8			25.5	25.5		15.5	
Effective Green, g (s)	8.2	32.0		12.0	35.8			25.0	25.0		15.0	
Actuated g/C Ratio	0.08	0.32		0.12	0.36			0.25	0.25		0.15	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	145	1096		212	1251			454	389		272	
v/s Ratio Prot	0.02	c0.44		0.09	c0.33			c0.29			c0.11	
v/s Ratio Perm									0.11			
v/c Ratio	0.23	1.38		0.78	0.93			1.18	0.45		0.75	
Uniform Delay, d1	43.0	34.0		42.7	31.0			37.5	31.7		40.7	
Progression Factor	1.00	1.00		1.18	0.59			1.00	1.00		1.00	
Incremental Delay, d2	0.6	177.7		1.7	1.7			101.1	0.6		10.7	
Delay (s)	43.6	211.7		52.0	20.0			138.6	32.3		51.4	
Level of Service	D	F		D	B			F	C		D	
Approach Delay (s)		208.0			23.9			100.2			51.4	
Approach LOS		F			C			F			D	
Intersection Summary												
HCM Average Control Delay		114.4		HCM Level of Service				F				
HCM Volume to Capacity ratio		1.16										
Actuated Cycle Length (s)		100.0		Sum of lost time (s)				16.0				
Intersection Capacity Utilization		106.0%		ICU Level of Service				G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3304		1770	3393		3433	3532		1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3304		1770	3393		3433	3532		1770	3482	
Volume (vph)	223	875	457	47	610	187	550	1344	16	283	1435	117
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	235	921	481	49	642	197	579	1415	16	298	1511	123
RTOR Reduction (vph)	0	65	0	0	29	0	0	1	0	0	6	0
Lane Group Flow (vph)	235	1337	0	49	810	0	579	1430	0	298	1628	0
Confl. Peds. (#/hr)			22			9			19			33
Confl. Bikes (#/hr)			2			1			4			10
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	16.5	29.9		6.6	20.0		14.0	36.4		15.1	37.5	
Effective Green, g (s)	14.5	28.9		4.6	19.0		13.0	36.4		14.1	37.5	
Actuated g/C Ratio	0.14	0.28		0.05	0.18		0.13	0.36		0.14	0.36	
Clearance Time (s)	3.0	3.0		3.0	3.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	257	955		81	845		446	1286		250	1308	
v/s Ratio Prot	c0.13	c0.40		0.03	0.24		0.17	c0.41		0.17	c0.47	
v/s Ratio Perm												
v/c Ratio	0.91	1.40		0.60	1.26		1.30	1.11		1.19	1.25	
Uniform Delay, d1	42.1	35.6		46.8	40.5		43.5	31.8		43.0	31.2	
Progression Factor	0.60	0.90		0.97	0.97		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	180.4		7.5	126.1		149.9	61.8		118.9	117.4	
Delay (s)	30.2	212.5		53.0	165.2		193.4	93.6		161.8	149.7	
Level of Service	C	F		D	F		F	F		F	F	
Approach Delay (s)		186.4			159.0			122.4			150.7	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		152.1		HCM Level of Service				F				
HCM Volume to Capacity ratio		1.21										
Actuated Cycle Length (s)		100.0		Sum of lost time (s)				8.0				
Intersection Capacity Utilization		115.5%		ICU Level of Service				H				
Analysis Period (min)		15										
c Critical Lane Group												

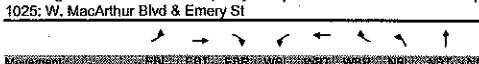
HCM Signalized Intersection Capacity Analysis
1023: 40th St & Adeline St

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑			↓↓			↓↓	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	3529		1770	3461			3374			3318	
Flt Permitted	0.95	1.00		0.95	1.00			0.92			0.71	
Satd. Flow (perm)	1770	3529		1770	3461			3110			2395	
Volume (vph)	47	1010	17	45	878	99	19	292	107	90	229	142
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1063	18	47	714	104	20	307	113	95	241	149
RTOR Reduction (vph)	0	2	0	0	18	0	0	69	0	0	102	0
Lane Group Flow (vph)	49	1079	0	47	800	0	0	371	0	0	383	0
Confl. Peds. (#/hr)			10			15	16		16	16		16
Confl. Bikes (#/hr)			1			3			2			2
Turn Type	Prot			Prot			Perm		Perm			
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	2.9	28.0		2.8	25.9			10.2			10.2	
Effective Green, g (s)	2.4	28.0		2.3	25.9			9.7			9.7	
Actuated g/C Ratio	0.05	0.52		0.05	0.62			0.19			0.19	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5			3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	85	1835		81	1793			603			465	
v/s Ratio Prot	c0.03	c0.31		0.03	0.23							
v/s Ratio Perm								0.12			c0.16	
v/c Ratio	0.58	0.59		0.58	0.45			0.62			0.82	
Uniform Delay, d1	23.3	6.3		23.4	7.6			18.4			19.3	
Progression Factor	1.03	1.42		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.1		6.6	0.8			1.9			11.2	
Delay (s)	24.5	11.9		30.0	8.4			20.3			30.5	
Level of Service	C	B		C	A			C			C	
Approach Delay (s)		12.5			9.6			20.3			30.5	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM Average Control Delay		15.8		HCM Level of Service				B				
HCM Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		50.0		Sum of lost time (s)				8.0				
Intersection Capacity Utilization		80.3%		ICU Level of Service				D				
Analysis Period (min)		15										
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳					↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.98		0.94			0.96			0.90	
Flt Protected		0.95	1.00		0.99			0.99			0.99	
Satd. Flow (prot)		1770	1833		1734			1768			1686	
Flt Permitted		0.28	1.00		0.87			0.90			0.89	
Satd. Flow (perm)		518	1833		1537			1601			1493	
Volume (vph)	560	95	11	86	105	140	19	83	50	167	59	562
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	589	100	12	91	111	147	20	87	53	176	62	592
RTOR Reduction (vph)	0	5	0	0	29	0	0	20	0	0	100	0
Lane Group Flow (vph)	589	107	0	0	320	0	0	140	0	0	730	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			1			6	
Permitted Phases	4			8			1			6		
Actuated Green, G (s)	41.0	41.0			17.0			41.0			41.0	
Effective Green, g (s)	41.0	41.0			17.0			41.0			41.0	
Actuated g/C Ratio	0.46	0.46			0.19			0.46			0.46	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	514	835			290			729			680	
v/s Ratio Prot	c0.25	0.06										
v/s Ratio Perm	c0.27				0.21			0.09			c0.49	
v/c Ratio	1.15	0.13			1.10			0.19			1.07	
Uniform Delay, d1	21.2	14.2			36.5			14.6			24.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	86.5	0.1			83.2			0.1			56.1	
Delay (s)	107.8	14.2			119.7			14.8			80.6	
Level of Service	F	B			F			B			F	
Approach Delay (s)		92.6			119.7			14.8			80.6	
Approach LOS		F			F			B			F	

Intersection Summary			
HCM Average Control Delay	86.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	118.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↳		↱	↱		↟			↟	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.94		1.00	0.85		0.97			0.97	
Flt Protected		0.95	1.00		0.97	1.00		0.99			1.00	
Satd. Flow (prot)		1770	1760		1801	1583		1787			1805	
Flt Permitted		0.95	1.00		0.97	1.00		0.67			0.97	
Satd. Flow (perm)		1770	1760		1801	1583		1208			1747	
Volume (vph)	351	98	57	100	47	25	171	393	155	21	413	120
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	369	103	60	105	49	26	180	414	163	22	435	126
RTOR Reduction (vph)	0	24	0	0	0	23	0	9	0	0	9	0
Lane Group Flow (vph)	369	139	0	0	184	3	0	748	0	0	574	0
Turn Type	Split			Split			Perm	Perm			Perm	
Protected Phases	3	3		4	4			6			2	
Permitted Phases						4	6			2		
Actuated Green, G (s)	17.8	17.8			6.5	6.5		31.5			31.5	
Effective Green, g (s)	16.6	16.6			7.5	7.5		30.5			30.5	
Actuated g/C Ratio	0.25	0.25			0.11	0.11		0.46			0.46	
Clearance Time (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	441	439			203	178		553			800	
v/s Ratio Prot	c0.21	0.08			c0.09							
v/s Ratio Perm						0.00		c0.62			0.33	
v/c Ratio	0.84	0.32			0.76	0.02		1.35			0.72	
Uniform Delay, d1	23.7	20.4			28.7	26.3		18.0			14.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Incremental Delay, d2	12.4	0.2			13.4	0.0		170.6			2.6	
Delay (s)	36.1	20.5			42.1	26.3		188.6			17.1	
Level of Service	D	C			D	C		F			B	
Approach Delay (s)		31.4			39.8			188.6			17.1	
Approach LOS		C			D			F			B	

Intersection Summary			
HCM Average Control Delay	86.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↟			↰↟			↟↑			↟↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.99			0.99			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		3461			3432			3511			3509	
Flt Permitted		0.76			0.98			1.00			1.00	
Satd. Flow (perm)		2646			3432			3511			3509	
Volume (vph)	121	332	32	122	218	38	0	1629	92	0	1835	110
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	349	34	128	227	38	0	1715	97	0	1932	116
RTOR Reduction (vph)	0	5	0	0	8	0	0	4	0	0	4	0
Lane Group Flow (vph)	0	505	0	0	385	0	0	1808	0	0	2044	0
Turn Type	Perm			Split								
Protected Phases		4		3	3			2			6	
Permitted Phases	4											
Actuated Green, G (s)		17.0			15.0			57.0			57.0	
Effective Green, g (s)		18.0			16.0			59.0			59.0	
Actuated g/C Ratio		0.17			0.16			0.56			0.56	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			4.0			4.0	
Lane Grp Cap (vph)		454			523			1973			1972	
v/s Ratio Prot					c0.11			0.52			c0.58	
v/s Ratio Perm		c0.19										
v/c Ratio		1.11			0.74			0.92			1.04	
Uniform Delay, d1		43.5			42.5			20.8			23.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		76.5			4.6			8.2			30.4	
Delay (s)		120.0			47.1			29.0			53.4	
Level of Service		F			D			C			D	
Approach Delay (s)		120.0			47.1			29.0			53.4	
Approach LOS		F			D			C			D	

Intersection Summary			
HCM Average Control Delay	50.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↟			↰↟			↟↑			↟↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			0.95			0.91	
Frt		1.00			0.85			1.00			1.00	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		3521			1583			3532			5077	
Flt Permitted		0.98			1.00			0.72			1.00	
Satd. Flow (perm)		3521			1583			2533			5077	
Volume (vph)	0	0	0	64	503	49	1119	0	0	1854	21	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	67	591	845	52	1178	0	0	1952	22
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	658	786	0	1230	0	0	1973	0
Turn Type				Split		Perm	Perm					
Protected Phases				8	8			2			6	
Permitted Phases						8	2					
Actuated Green, G (s)					27.0	27.0		54.0			54.0	
Effective Green, g (s)					27.0	27.0		55.0			55.0	
Actuated g/C Ratio					0.30	0.30		0.61			0.61	
Clearance Time (s)					4.0	4.0		5.0			5.0	
Vehicle Extension (s)					2.0	2.0		4.0			4.0	
Lane Grp Cap (vph)					1056	475		1548			3103	
v/s Ratio Prot					0.19						0.39	
v/s Ratio Perm						c0.50		c0.49				
v/c Ratio					0.62	1.66		0.79			0.64	
Uniform Delay, d1					27.1	31.5		13.2			11.1	
Progression Factor					1.00	1.00		1.00			1.00	
Incremental Delay, d2					0.8	304.1		4.3			1.0	
Delay (s)					27.9	335.6		17.5			12.1	
Level of Service					C	F		B			B	
Approach Delay (s)		0.0			200.9			17.5			12.1	
Approach LOS		A			F			B			B	

Intersection Summary			
HCM Average Control Delay	73.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1028: 35th St & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#4 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↺						↑↑	↱	↑↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.95		0.97	0.95	
Frt		0.99						0.99		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		3491						3504		3433	3539	
Flt Permitted		1.00						1.00		0.95	1.00	
Satd. Flow (perm)		3491						3504		3433	3539	
Volume (vph)	28	851	78	0	0	0	0	1086	78	927	1026	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	896	82	0	0	0	0	1143	82	976	1080	0
RTOR Reduction (vph)	0	6	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	1011	0	0	0	0	0	1220	0	976	1080	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)		27.0						36.0		30.0	74.0	
Effective Green, g (s)		28.0						39.0		31.0	74.0	
Actuated g/C Ratio		0.25						0.36		0.28	0.67	
Clearance Time (s)		5.0						5.0		5.0	4.0	
Vehicle Extension (s)		2.0						0.2		2.0	2.0	
Lane Grp Cap (vph)		869						1242		967	2381	
v/s Ratio Prot		c0.29						c0.35		c0.28	0.31	
v/s Ratio Perm												
v/c Ratio		1.14						0.98		1.01	0.45	
Uniform Delay, d1		41.0						35.2		39.5	8.5	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		75.5						21.7		31.2	0.1	
Delay (s)		116.5						56.9		70.7	8.5	
Level of Service		F						E		E	A	
Approach Delay (s)		116.5			0.0			56.9			38.1	
Approach LOS		F			A			E			D	

Intersection Summary				
HCM Average Control Delay	62.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
1003: 65th Street & Christie Ave

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	12	0	141	12	1	0	3	181	1	7	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	0	153	13	1	0	3	197	1	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					573							
pX, platoon unblocked												
vC, conflicting volume	14			13			340	334	13	532	333	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			13			340	334	13	532	333	14
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	99	82	100	99	100
cM capacity (veh/h)	1604			1605			561	530	1067	345	631	1058

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	167	200	12
Volume Left	0	153	0	1
Volume Right	0	1	197	3
cSH	1604	1605	1050	582
Volume to Capacity	0.00	0.10	0.19	0.02
Queue Length 95th (ft)	0	8	18	2
Control Delay (s)	0.0	6.9	9.2	11.3
Lane LOS		A	A	B
Approach Delay (s)	0.0	6.9	9.2	11.3
Approach LOS			A	B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1004: 65th Street & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.88			0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1802		1770	1641			1762		1770	1837	
Flt Permitted	0.35	1.00		0.72	1.00			0.98		0.21	1.00	
Satd. Flow (perm)	657	1802		1332	1641			1733		399	1837	
Volume (vph)	110	46	13	214	67	256	13	434	292	90	737	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	50	14	233	73	278	14	472	317	98	801	82
RTOR Reduction (vph)	0	10	0	0	197	0	0	40	0	0	6	0
Lane Group Flow (vph)	120	54	0	233	154	0	0	763	0	98	877	0
Turn Type	Perm			Perm			Perm			pm+pt		
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.5	17.5		17.5	17.5			27.3		34.5	34.5	
Effective Green, g (s)	17.5	17.5		17.5	17.5			27.3		34.5	34.5	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.46		0.57	0.57	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	192	526		389	479			789		303	1056	
v/s Ratio Prot		0.03			0.09					0.02	c0.48	
v/s Ratio Perm	c0.19			0.17				c0.44		0.17		
v/c Ratio	0.66	0.10		0.60	0.32			0.97		0.32	0.83	
Uniform Delay, d1	18.6	15.5		18.2	16.6			15.9		9.0	10.4	
Progression Factor	1.00	1.00		0.78	0.68			1.00		1.00	1.00	
Incremental Delay, d2	16.2	0.4		6.6	1.7			24.0		0.8	5.6	
Delay (s)	34.8	15.9		20.4	11.9			39.9		9.6	16.0	
Level of Service	C	B		C	B			D		A	B	
Approach Delay (s)		28.4			14.7			39.9			15.4	
Approach LOS		C			B			D			B	

Intersection Summary				
HCM Average Control Delay	23.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.9%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1005: 65th Street & Overland Avenue

2030 Plus Alt#4 SAT

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↱	↑	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	1821		1770	1863	1764	
Flt Permitted	1.00		0.95	1.00	0.96	
Satd. Flow (perm)	1821		1770	1863	1764	
Volume (vph)	147	29	43	158	225	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	32	47	172	245	17
RTOR Reduction (vph)	9	0	0	0	5	0
Lane Group Flow (vph)	183	0	47	172	257	0
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Actuated Green, G (s)	31.2		3.4	38.6	13.4	
Effective Green, g (s)	31.2		3.4	38.6	13.4	
Actuated g/C Ratio	0.52		0.06	0.64	0.22	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	947		100	1199	394	
v/s Ratio Prot	c0.10		c0.03	0.09	c0.15	
v/s Ratio Perm						
v/c Ratio	0.19		0.47	0.14	0.65	
Uniform Delay, d1	7.7		27.4	4.2	21.2	
Progression Factor	0.57		1.00	1.00	1.00	
Incremental Delay, d2	0.3		3.5	0.3	3.9	
Delay (s)	4.7		30.9	4.5	25.0	
Level of Service	A		C	A	C	
Approach Delay (s)	4.7			10.1	25.0	
Approach LOS	A			B	C	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
1007: 64th Street & Christie Ave

2030 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↳			↳			↳			↳	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	2	13	99	3	17	5	165	85	2	120	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	14	108	3	18	5	179	92	2	130	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	277	133
Volume Left (vph)	0	108	5	0
Volume Right (vph)	14	18	92	0
Hadj (s)	0.49	0.11	-0.16	0.04
Departure Headway (s)	4.5	5.0	4.3	4.6
Degree Utilization, x	0.02	0.18	0.33	0.17
Capacity (veh/h)	704	669	812	736
Control Delay (s)	7.6	9.0	9.4	8.6
Approach Delay (s)	7.6	9.0	9.4	8.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay		9.0		
HCM Level of Service		A		
Intersection Capacity Utilization	36.7%		ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1008: 64th Street & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations			↰	↑	↑	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	112	33	23	670	815	156
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	122	36	25	728	886	170
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					627	
pX, platoon unblocked	0.53	0.53	0.53			
vC, conflicting volume	1749	971	1056			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2403	945	1104			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	79	93			
cM capacity (veh/h)	18	170	338			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	158	25	728	1055
Volume Left	122	25	0	0
Volume Right	36	0	0	170
cSH	23	338	1700	1700
Volume to Capacity	6.94	0.07	0.43	0.62
Queue Length 95th (ft)	Err	6	0	0
Control Delay (s)	Err	16.5	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	0.5	0.0	
Approach LOS	F			

Intersection Summary				
Average Delay		601.7		
Intersection Capacity Utilization	67.3%		ICU Level of Service	C
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
1009: Shellmound Way & Christie Ave

2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↳		↰	↑↑	↱		↰↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	0.94		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.98		1.00	1.00	0.85		0.99	
Flt Protected		0.97	1.00	0.95	0.97		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1810	1583	1681	1648		1770	3539	1486		3479	
Flt Permitted		0.97	1.00	0.95	0.97		0.21	1.00	1.00		0.93	
Satd. Flow (perm)		1810	1583	1681	1648		389	3539	1486		3231	
Volume (vph)	31	22	136	958	78	72	143	356	479	26	563	53
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	24	148	1041	85	78	155	387	521	27	612	58
RTOR Reduction (vph)	0	0	38	0	5	0	0	0	358	0	8	0
Lane Group Flow (vph)	0	58	110	623	576	0	155	387	163	0	699	0
Confl. Peds. (#/hr)						26			15	15		
Confl. Bikes (#/hr)						7			9			
Turn Type	Split		Perm	Split			Perm		Perm	Perm		
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4				2		2	6		
Actuated Green, G (s)		25.0	25.0	39.0	39.0		35.0	35.0	35.0		35.0	
Effective Green, g (s)		24.5	24.5	39.0	39.0		34.5	34.5	34.5		34.5	
Actuated g/C Ratio		0.22	0.22	0.35	0.35		0.31	0.31	0.31		0.31	
Clearance Time (s)		3.5	3.5	4.0	4.0		3.5	3.5	3.5		3.5	
Vehicle Extension (s)		2.5	2.5	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		403	353	596	584		122	1110	467		1013	
v/s Ratio Prot		0.03		c0.37	0.35		c0.40	0.11			0.22	
v/s Ratio Perm			c0.07						0.11			
v/c Ratio		0.14	0.31	1.05	0.99		1.27	0.35	0.35		0.69	
Uniform Delay, d1		34.3	35.7	35.5	35.2		37.7	29.1	29.1		33.1	
Progression Factor		1.00	1.00	0.60	0.59		0.56	0.55	1.82		1.00	
Incremental Delay, d2		0.7	2.3	46.2	30.3		151.0	0.5	1.1		3.9	
Delay (s)		35.1	38.0	67.4	51.2		172.0	16.6	39.4		36.9	
Level of Service		D	D	E	D		F	B	D		D	
Approach Delay (s)		37.2			59.6			50.5			36.9	
Approach LOS		D			E			D			D	

Intersection Summary						
HCM Average Control Delay		50.0		HCM Level of Service		D
HCM Volume to Capacity ratio		0.94				
Actuated Cycle Length (s)		110.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		88.4%		ICU Level of Service		E
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
1010: Shellmound Way & Shellmound St

2030 Plus Alt#4 SAT

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱	↰↰	↑	↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	3433	1863	1863	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	3433	1863	1863	1583
Volume (vph)	443	67	691	910	396	432
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	482	73	751	989	433	470
RTOR Reduction (vph)	0	31	0	0	0	20
Lane Group Flow (vph)	482	42	751	989	433	450
Confl. Peds. (#/hr)		1				29
Confl. Bikes (#/hr)						11
Turn Type		pt+ov	Prot			pt+ov
Protected Phases	4	4 5	5	2	6	6 4
Permitted Phases						
Actuated Green, G (s)	31.4	63.2	28.3	71.6	39.8	74.7
Effective Green, g (s)	30.9	62.7	27.8	71.1	39.3	74.2
Actuated g/C Ratio	0.28	0.57	0.25	0.65	0.36	0.67
Clearance Time (s)	3.5		3.5	3.5	3.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	497	902	868	1204	666	1068
v/s Ratio Prot	c0.27	0.03	0.22	c0.53	0.23	0.28
v/s Ratio Perm						
v/c Ratio	0.97	0.05	0.87	0.82	0.65	0.42
Uniform Delay, d1	39.1	10.4	39.3	14.7	29.6	8.1
Progression Factor	0.57	0.39	0.59	1.85	1.00	1.00
Incremental Delay, d2	28.0	0.0	4.5	3.1	4.9	0.3
Delay (s)	50.5	4.0	27.7	30.2	34.5	8.4
Level of Service	D	A	C	C	C	A
Approach Delay (s)	44.4		29.1	20.9		
Approach LOS	D		C	C		

Intersection Summary						
HCM Average Control Delay		29.5		HCM Level of Service		C
HCM Volume to Capacity ratio		0.87				
Actuated Cycle Length (s)		110.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		79.1%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95		1.00	0.85	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Flt Permitted	0.95	1.00	1.00	0.95	0.96		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1681	1681		1770	3539	1583	1770	1838	
Volume (vph)	26	21	7	636	13	16	41	337	1321	135	481	31
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	23	8	909	14	17	45	366	1436	147	523	34
RTOR Reduction (vph)	0	0	8	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	28	23	0	477	462	0	45	366	1436	147	555	0
Confl. Peds. (#/hr)												18
Confl. Bikes (#/hr)												21
Turn Type	Split		Perm	Split			Prot		Free	Prot		
Protected Phases	7	7		8	8		6	2		1	6	
Permitted Phases			7						Free			
Actuated Green, G (s)	3.6	3.6	3.6	25.6	25.6		4.1	21.9	75.4	8.8	26.6	
Effective Green, g (s)	3.1	3.1	3.1	25.6	25.6		3.6	22.4	75.4	8.3	27.1	
Actuated g/C Ratio	0.04	0.04	0.04	0.34	0.34		0.05	0.30	1.00	0.11	0.36	
Clearance Time (s)	3.5	3.5	3.5	4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.5	2.5		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	73	77	65	571	571		85	1051	1583	195	661	
v/s Ratio Prot	0.02	0.01		0.28	0.27		0.03	0.10		0.08	0.30	
v/s Ratio Perm			0.00						c0.91			
v/c Ratio	0.38	0.30	0.01	0.84	0.81		0.53	0.35	0.91	0.75	0.84	
Uniform Delay, d1	35.2	35.1	34.7	23.0	22.7		35.1	20.8	0.0	32.6	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.8	0.0	10.1	8.0		2.7	0.1	9.1	13.6	9.1	
Delay (s)	36.4	35.9	34.7	33.0	30.7		37.8	20.9	9.1	46.2	31.2	
Level of Service	D	D	C	C	C		D	C	A	D	C	
Approach Delay (s)		36.0			31.9			12.2			34.3	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM Average Control Delay	22.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1012: Powell St & Frontage Rd
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		
Lane Util. Factor	1.00	0.95			0.91	0.91				0.97		1.00
Frpb, ped/bikes	1.00	1.00			0.96	0.97				1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00				1.00		1.00
Frt	1.00	0.99			0.92	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3490			2988	1399				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3490			2988	1399				3433		1583
Volume (vph)	115	309	31	0	418	1585	0	0	0	1077	0	259
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	336	34	0	454	1734	0	0	0	1171	0	282
RTOR Reduction (vph)	0	6	0	0	147	0	0	0	0	0	0	150
Lane Group Flow (vph)	125	364	0	0	803	1238	0	0	0	1171	0	132
Confl. Peds. (#/hr)						49						1
Confl. Bikes (#/hr)						12						1
Turn Type	Prot					Free				custom		custom
Protected Phases	5	2			6					4		4
Permitted Phases						Free				4		4
Actuated Green, G (s)	11.9	59.5			44.1	110.0				42.0		42.0
Effective Green, g (s)	11.4	59.5			44.1	110.0				42.5		42.5
Actuated g/C Ratio	0.10	0.54			0.40	1.00				0.39		0.39
Clearance Time (s)	3.5	4.0			4.0					4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0					2.5		2.5
Lane Grp Cap (vph)	183	1888			1198	1399				1326		612
v/s Ratio Prot	0.07	0.10			0.27							0.08
v/s Ratio Perm						c0.88				0.34		
v/c Ratio	0.68	0.19			0.67	0.88				0.88		0.22
Uniform Delay, d1	47.6	12.9			27.0	0.0				31.4		22.6
Progression Factor	1.00	1.00			0.97	1.00				1.00		1.00
Incremental Delay, d2	8.1	0.2			1.0	2.9				7.2		0.1
Delay (s)	55.7	13.2			27.1	2.9				38.7		22.7
Level of Service	E	B			C	A				D		C
Approach Delay (s)		23.9			13.4			0.0			35.6	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	77.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.91			*0.83	1.00	0.95	0.91	*0.59			
Frpb, ped/bikes	1.00	1.00			1.00	0.92	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	0.70			1.00	0.85	1.00	0.85	0.60			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3560			4638	1458	1681	1448	659			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3560			4638	1458	1681	1448	659			
Volume (vph)	123	1262	0	0	1586	491	427	21	1464	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1372	0	0	1724	534	464	23	1591	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	344	0	161	2	0	0	0
Lane Group Flow (vph)	134	1372	0	0	1724	190	464	657	794	0	0	0
Confl. Peds. (#/hr)						20						
Confl. Bikes (#/hr)						8						
Turn Type	Prot					Perm	Split		custom			
Protected Phases	5	2			6		4	4	4 1			
Permitted Phases						6						
Actuated Green, G (s)	11.3	37.0			39.2	39.2	48.0	48.0	65.0			
Effective Green, g (s)	10.8	37.0			39.2	39.2	48.0	48.0	65.0			
Actuated g/C Ratio	0.10	0.34			0.36	0.36	0.44	0.44	0.59			
Clearance Time (s)	3.5	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	3.5	3.5				
Lane Grp Cap (vph)	174	1197			1653	520	734	632	389			
v/s Ratio Prot	0.08	c0.39			0.37		0.28	0.45	c1.20			
v/s Ratio Perm						0.13						
v/c Ratio	0.77	1.15			1.04	0.37	0.63	1.04	2.04			
Uniform Delay, d1	48.4	36.5			35.4	26.2	24.1	31.0	22.5			
Progression Factor	1.20	0.82			0.98	1.30	1.00	1.00	1.00			
Incremental Delay, d2	14.0	74.1			26.3	1.0	4.1	46.4	477.8			
Delay (s)	72.2	96.6			63.1	35.1	28.2	77.4	500.3			
Level of Service	E	F			E	D	C	E	F			
Approach Delay (s)		94.4			56.5			228.4			0.0	
Approach LOS		F			E			F			A	

Intersection Summary				
HCM Average Control Delay	127.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.70			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	91.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1014: Powell St & Christie Ave
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	*0.77	1.00	0.95	1.00	0.95	0.95	1.00		1.00	*0.83
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.95	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (prot)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1814	2828
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00		0.97	1.00
Satd. Flow (perm)	3433	3167	1219	1770	3539	1524	1681	1719	1497		1814	2628
Volume (vph)	558	946	1230	350	751	306	227	62	101	306	270	1092
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	607	1028	1337	380	816	333	247	67	110	333	293	1187
RTOR Reduction (vph)	0	50	85	0	0	61	0	0	98	0	0	27
Lane Group Flow (vph)	607	1486	742	380	816	252	153	161	12	0	626	1160
Confl. Peds. (#/hr)			31			23	27		15	15		27
Confl. Bikes (#/hr)			10			4			1			8
Turn Type	Prot		pt+ov	Prot		Perm	Split		Perm	Split		pt+ov
Protected Phases	1	6	6 7	5	2		7	7		8	8	1 8
Permitted Phases						2			7			
Actuated Green, G (s)	19.5	35.5	48.0	17.5	32.5	32.5	12.5	12.5	12.5		30.5	53.5
Effective Green, g (s)	19.0	35.0	47.0	17.0	33.0	33.0	12.0	12.0	12.0		30.0	53.0
Actuated g/C Ratio	0.17	0.32	0.43	0.15	0.30	0.30	0.11	0.11	0.11		0.27	0.48
Clearance Time (s)	3.5	3.5		3.5	4.5	4.5	3.5	3.5	3.5		3.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.5	2.5	2.5		4.0	
Lane Grp Cap (vph)	593	1008	521	274	1062	457	183	198	163		495	1266
v/s Ratio Prot	0.18	c0.47	c0.61	c0.21	0.23		0.09	0.09			c0.35	0.44
v/s Ratio Perm						0.17			0.01			
v/c Ratio	1.02	1.48	1.42	1.39	0.77	0.55	0.84	0.86	0.07		1.26	0.92
Uniform Delay, d1	45.5	37.5	31.5	46.5	35.0	32.3	48.0	48.2	44.0		40.0	26.4
Progression Factor	1.20	1.03	1.06	1.00	1.00	1.00	1.26	1.26	2.47		0.90	0.66
Incremental Delay, d2	17.7	214.9	191.6	195.1	5.3	4.7	23.7	28.6	0.1		127.2	6.6
Delay (s)	72.3	253.4	224.9	241.6	40.4	37.0	84.3	87.3	108.7		163.1	24.0
Level of Service	E	F	F	F	D	D	F	F	F		F	C
Approach Delay (s)		208.5			89.7			91.8			72.0	
Approach LOS		F			F			F			E	

Intersection Summary				
HCM Average Control Delay	137.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.38			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	114.1%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1015: Christie Ave & Shellmound St
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0			4.0	
Lane Util. Factor	0.91	0.91	0.88					0.95			1.00	
Frpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00			1.00	
Frt	1.00	1.00	0.85					1.00			1.00	
Flt Protected	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (prot)	1610	3366	2787					3532			1863	
Flt Permitted	0.95	0.99	1.00					1.00			1.00	
Satd. Flow (perm)	1610	3366	2787					3532			1863	
Volume (vph)	167	230	1078	0	0	0	0	1581	21	0	459	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	250	1172	0	0	0	0	1718	23	0	499	0
RTOR Reduction (vph)	0	0	106	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	139	293	1066	0	0	0	0	1740	0	0	499	0
Confl. Peds. (#/hr)			28									
Confl. Bikes (#/hr)			8									
Turn Type	Split		custom									
Protected Phases	4	4	4 5					2			6	
Permitted Phases												
Actuated Green, G (s)	44.5	44.5	52.0					58.5			51.0	
Effective Green, g (s)	44.0	44.0	51.5					58.0			50.5	
Actuated g/C Ratio	0.40	0.40	0.47					0.53			0.46	
Clearance Time (s)	3.5	3.5						3.5			3.5	
Vehicle Extension (s)	2.5	2.5						3.0			3.0	
Lane Grp Cap (vph)	644	1346	1305					1862			855	
v/s Ratio Prot	0.09	0.09	c0.38					c0.49			0.27	
v/s Ratio Perm												
v/c Ratio	0.22	0.22	0.82					0.93			0.58	
Uniform Delay, d1	21.7	21.7	25.2					24.2			22.0	
Progression Factor	1.04	1.04	1.10					0.55			0.46	
Incremental Delay, d2	0.7	0.3	3.5					7.4			2.4	
Delay (s)	23.2	23.0	31.2					20.8			12.9	
Level of Service	C	C	C					C			B	
Approach Delay (s)		29.0			0.0			20.8			12.9	
Approach LOS		C			A			C			B	

Intersection Summary				
HCM Average Control Delay	23.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1016: Powell St & Hollis Street
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3335		1770	3508		1770	1839		1770	1863	1549
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3335		1770	3508		1770	1839		1770	1863	1549
Volume (vph)	101	701	386	40	764	38	332	268	22	37	283	98
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	762	420	43	830	41	361	313	24	40	308	107
RTOR Reduction (vph)	0	102	0	0	5	0	0	4	0	0	0	84
Lane Group Flow (vph)	110	1080	0	43	866	0	361	333	0	40	308	23
Confl. Peds. (#/hr)			1			8			3			7
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases												7
Actuated Green, G (s)	4.0	19.5		2.3	17.8		15.3	15.3		14.2	14.2	14.2
Effective Green, g (s)	4.0	19.5		2.3	17.8		15.3	15.3		14.2	14.2	14.2
Actuated g/C Ratio	0.06	0.28		0.03	0.26		0.23	0.23		0.21	0.21	0.21
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	105	966		60	928		402	418		373	393	327
v/s Ratio Prot	c0.06	c0.32		0.02	0.25		c0.20	0.18		0.02	c0.17	
v/s Ratio Perm												0.01
v/c Ratio	1.05	1.12		0.72	0.93		0.90	0.80		0.11	0.78	0.07
Uniform Delay, d1	31.6	23.9		32.2	24.2		25.2	24.5		21.4	25.1	21.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	101.2	67.0		33.3	15.6		22.0	10.1		0.1	9.8	0.1
Delay (s)	132.9	90.9		65.5	39.9		47.2	34.7		21.6	34.9	21.3
Level of Service	F	F		E	D		D	C		C	C	C
Approach Delay (s)		94.4			41.1			41.2			30.6	
Approach LOS		F			D			D			C	

Intersection Summary				
HCM Average Control Delay	80.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1021: 40th St & Emery Street
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1770	3422		1770	3520			1809	1555		1785	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.99	
Satd. Flow (perm)	1770	3422		1770	3520			1809	1555		1785	
Volume (vph)	19	1249	226	176	1343	92	256	174	219	12	46	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1358	246	190	1460	35	280	189	238	13	50	16
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	113	0	11	0
Lane Group Flow (vph)	21	1591	0	190	1494	0	0	469	125	0	69	0
Confl. Peds. (#/hr)			15			20			5			17
Confl. Bikes (#/hr)			9			6						11
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.6	35.9		11.6	45.9			25.0	25.0		13.0	
Effective Green, g (s)	1.1	35.9		11.1	45.9			24.5	24.5		12.5	
Actuated g/C Ratio	0.01	0.36		0.11	0.46			0.24	0.24		0.12	
Clearance Time (s)	3.5	4.0		3.5	4.0			3.5	3.5		3.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	19	1228		196	1616			443	381		223	
v/s Ratio Prot	0.01	c0.46		0.11	c0.42			c0.26			c0.04	
v/s Ratio Perm									0.08			
v/c Ratio	1.11	1.30		0.97	0.92			1.06	0.33		0.31	
Uniform Delay, d1	49.4	32.0		44.3	25.4			37.8	31.0		39.8	
Progression Factor	0.94	0.73		0.81	0.69			1.00	1.00		1.00	
Incremental Delay, d2	238.0	139.0		12.7	1.2			59.1	0.4		0.6	
Delay (s)	284.4	162.4		48.7	18.8			96.9	31.4		40.4	
Level of Service	F	F		D	B			F	C		D	
Approach Delay (s)		163.9			22.2			74.8			40.4	
Approach LOS		F			C			E			D	

Intersection Summary				
HCM Average Control Delay	87.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
1022: 40th St & San Pablo Avenue
2030 Plus Alt#4 SAT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.92		1.00	0.98		1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3077		1770	3387		3433	3516		1770	3354	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3077		1770	3387		3433	3516		1770	3354	
Volume (vph)	192	787	483	72	880	103	635	1109	25	156	1174	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	855	525	78	739	118	690	1205	27	170	1276	228
RTOR Reduction (vph)	0	92	0	0	13	0	0	1	0	0	14	0
Lane Group Flow (vph)	209	1288	0	78	844	0	690	1231	0	170	1490	0
Confl. Peds. (#/hr)			121			98			100			130
Confl. Bikes (#/hr)			31			13			12			11
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.7	32.3		5.2	23.8		16.5	34.0		12.6	30.0	
Effective Green, g (s)	13.2	32.3		4.7	23.8		16.0	35.0		12.0	31.0	
Actuated g/C Ratio	0.13	0.32		0.05	0.24		0.16	0.35		0.12	0.31	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	2.5		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	234	994		83	806		549	1231		212	1040	
v/s Ratio Prot	c0.12	c0.42		0.04	0.25		c0.20	0.35		0.10	c0.44	
v/s Ratio Perm												
v/c Ratio	0.89	1.30		0.94	1.05		1.26	1.00		0.80	1.43	
Uniform Delay, d1	42.7	33.9		47.5	38.1		42.0	32.5		42.8	34.5	
Progression Factor	1.35	0.27		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	133.8		77.0	44.8		129.9	25.6		18.3	200.1	
Delay (s)	62.1	143.1		124.5	82.9		171.9	58.1		61.1	234.6	
Level of Service	E	F		F	F		F	E		E	F	
Approach Delay (s)		132.4			86.3			98.9			217.0	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	136.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.33			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	115.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

APPENDIX B-3

ALTERNATIVES
QUEUE MODELING OUTPUTS

- **Alternative 1: No Project (see Appendix B-1 Outputs for No Project Condition)**
- **Alternative 2: Reduced Project Alternative**
- **Alternative 3: Tower Alternative**
- **Alternative 4: Main Street Alternative**

SYNCHRO QUEUE SHEETS
ALTERNATIVE #2
BASE YEAR

Queues
1001: Ashby (SR 13) & Seventh St

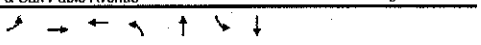
Marketplace Redevelopment
Existing Plus Alt#2 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1178	111	692	92	231	64	198	202
v/c Ratio	0.97	0.67	0.65	0.67	0.50	0.62	0.25	0.74	0.50
Control Delay	68.2	22.5	47.5	55.1	50.0	44.8	42.2	53.2	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	22.5	47.5	55.1	50.0	44.8	42.2	53.2	9.2
Queue Length 50th (ft)	375	307	77	271	62	75	40	135	0
Queue Length 95th (ft)	#596	433	m140	#352	112	113	79	209	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1761	193	1030	257	519	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.67	0.58	0.67	0.36	0.45	0.21	0.61	0.46

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
Existing Plus Alt#2 AM

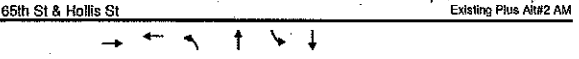


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	723	141	576	123	791
v/c Ratio	0.47	0.79	0.82	0.67	0.39	0.48	0.49
Control Delay	19.0	20.5	35.1	54.1	22.9	50.1	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	20.5	35.1	54.1	22.9	50.1	23.5
Queue Length 50th (ft)	17	156	236	90	140	81	198
Queue Length 95th (ft)	m25	107	282	160	210	141	300
Internal Link Dist (ft)		1299	1805		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	226	1522	1228	257	1519	257	1598
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.57	0.59	0.55	0.38	0.48	0.49

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1006: 65th St & Hollis St

Marketplace Redevelopment
Existing Plus Alt#2 AM



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	248	98	39	309	25	460
v/c Ratio	0.59	0.33	0.20	0.26	0.14	0.45
Control Delay	16.2	20.2	18.7	8.0	21.0	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	20.2	18.7	8.0	21.0	9.9
Queue Length 50th (ft)	32	24	11	20	7	50
Queue Length 95th (ft)	#90	57	31	131	24	172
Internal Link Dist (ft)	663	1788		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	419	295	283	1109	283	1023
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.33	0.14	0.28	0.09	0.45

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBT	WBR	SBT
Lane Group Flow (vph)	303	302	314	315
v/c Ratio	0.19	0.19	0.35	0.21
Control Delay	9.5	2.3	4.5	16.6
Queue Delay	0.0	0.0	2.8	0.0
Total Delay	9.5	2.3	7.2	16.6
Queue Length 50th (ft)	17	3	0	61
Queue Length 95th (ft)	50	m2	m0	89
Internal Link Dist (ft)	535	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1575	1628	898	1514
Starvation Cap Reductn	0	0	462	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.19	0.72	0.21

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	267	16	242	171	71	112
v/c Ratio	0.81	0.03	0.83	0.12	0.07	0.29
Control Delay	54.1	25.7	30.7	1.1	11.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	25.7	30.7	1.1	11.0	8.2
Queue Length 50th (ft)	183	4	35	4	20	0
Queue Length 95th (ft)	#276	m26	47	5	44	44
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	922	1296	1366	1084	421
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.02	0.20	0.13	0.07	0.27

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	344	362	96	39	659	65	315
v/c Ratio	0.03	0.12	0.10	0.62	0.64	0.41	0.04	0.42	0.31	0.59
Control Delay	35.2	35.4	18.2	23.4	23.8	31.7	18.6	0.8	32.3	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	35.4	18.2	23.4	23.8	31.7	18.6	0.8	32.3	21.5
Queue Length 50th (ft)	2	9	0	118	126	35	6	0	24	103
Queue Length 95th (ft)	14	36	20	#281	#317	95	18	0	71	219
Internal Link Dist (ft)		765			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	449	460	409	741	751	431	1494	1583	544	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.46	0.48	0.22	0.03	0.42	0.12	0.38

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	785	721	139
v/c Ratio	0.38	0.19	0.49	0.54	0.84	0.28
Control Delay	39.3	3.9	18.9	3.8	36.6	5.3
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	39.3	3.9	19.2	3.8	36.6	5.3
Queue Length 50th (ft)	72	24	117	218	226	0
Queue Length 95th (ft)	129	52	m160	m250	267	42
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	940					190
Base Capacity (vph)	336	2274	1493	1441	1373	717
Starvation Cap Reductn	0	0	296	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.62	0.54	0.53	0.19

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	878	884	316	556	666	654
v/c Ratio	0.25	0.37	0.60	0.44	0.87	1.02	0.80
Control Delay	20.6	9.7	15.1	2.4	45.0	65.5	39.4
Queue Delay	0.0	1.3	0.1	0.0	0.0	1.4	0.1
Total Delay	20.6	11.0	15.2	2.4	45.0	66.9	39.5
Queue Length 50th (ft)	14	151	97	2	340	~405	349
Queue Length 95th (ft)	43	136	118	5	#548	#668	#598
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	721	639	653	727
Starvation Cap Reductn	0	1230	0	0	0	0	0
Spillback Cap Reductn	0	109	45	0	0	3	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.61	0.44	0.87	1.02	0.80

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	562	1201	347	49	647	117	24	25	46	126	522
v/c Ratio	0.82	0.85	0.38	0.36	0.68	0.26	0.21	0.21	0.30	0.29	0.34
Control Delay	51.3	21.8	1.4	38.5	25.7	13.4	44.5	44.6	15.3	31.1	6.8
Queue Delay	0.4	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	23.8	1.6	38.5	25.7	13.4	44.5	44.6	15.3	31.1	6.8
Queue Length 50th (ft)	199	272	8	26	110	21	15	15	0	72	0
Queue Length 95th (ft)	m#253	m#504	m14	m47	141	m45	41	42	34	114	62
Internal Link Dist (ft)		965			570			520		294	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	689	1405	912	142	956	454	186	186	215	542	1517
Starvation Cap Reductn	0	99	127	0	0	0	0	0	0	0	86
Spillback Cap Reductn	12	0	0	0	0	3	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.92	0.44	0.35	0.68	0.26	0.13	0.13	0.21	0.23	0.36

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	382	92
v/c Ratio	0.03	0.03	0.14	0.06	0.22	0.25	0.14
Control Delay	19.4	19.0	2.4	45.0	19.4	18.0	34.6
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.0	34.6
Queue Length 50th (ft)	6	9	0	4	0	77	55
Queue Length 95th (ft)	26	22	21	19	24	110	97
Internal Link Dist (ft)		119				620	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1553	681
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.25	0.14

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	606	37	503	250	216	28	153	101
v/c Ratio	0.79	0.35	0.28	0.62	0.79	0.65	0.12	0.63	0.34
Control Delay	27.9	11.0	46.6	37.4	44.3	39.3	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	11.0	46.6	37.4	44.3	39.3	31.3	38.9	9.9
Queue Length 50th (ft)	237	118	22	147	156	127	16	95	0
Queue Length 95th (ft)	m#428	m221	54	203	237	200	29	100	39
Internal Link Dist (ft)		159		1493		987		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	531	1714	159	810	409	428	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.35	0.23	0.62	0.61	0.50	0.08	0.39	0.25

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	284	97	438	112	548	53	702
v/c Ratio	0.68	0.50	0.59	0.72	0.61	0.28	0.41	0.39
Control Delay	65.8	27.4	50.0	39.3	45.6	13.5	45.9	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	27.4	50.0	39.3	45.6	13.5	45.9	17.2
Queue Length 50th (ft)	47	60	60	138	69	95	33	141
Queue Length 95th (ft)	#108	98	111	181	120	158	70	223
Internal Link Dist (ft)		207		2635		1967		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	907	212	1059	301	1967	230	1807
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.31	0.46	0.41	0.37	0.28	0.23	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	220	47	321	66	51	91	38
v/c Ratio	0.25	0.11	0.38	0.15	0.07	0.29	0.46	0.16
Control Delay	48.0	11.4	50.1	11.3	4.6	42.5	31.3	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	11.4	50.1	11.3	4.6	42.5	31.3	28.6
Queue Length 50th (ft)	16	27	29	52	0	31	35	17
Queue Length 95th (ft)	42	71	64	105	26	67	87	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1998	140	2145	986	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.11	0.34	0.15	0.07	0.11	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	206	55	404	179	127	246	42	59	143
v/c Ratio	0.26	0.12	0.42	0.22	0.20	0.65	0.59	0.10	0.48	0.42
Control Delay	46.9	15.7	48.9	17.0	4.2	48.0	34.6	9.0	56.4	32.0
Queue Delay	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.7	48.9	17.5	4.7	48.0	34.6	9.0	56.4	32.0
Queue Length 50th (ft)	19	27	34	66	0	79	153	0	38	86
Queue Length 95th (ft)	47	70	71	142	46	134	185	25	81	93
Internal Link Dist (ft)		250		214			386			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1694	164	1838	908	266	671	489	142	536
Starvation Cap Reductn	0	0	0	957	400	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.12	0.34	0.46	0.35	0.49	0.37	0.09	0.42	0.27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	294	75	576	164	120	37
v/c Ratio	0.04	0.16	0.53	0.27	0.87	0.28	0.26
Control Delay	47.3	17.7	50.1	8.1	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.7	50.1	8.3	52.9	6.6	37.5
Queue Length 50th (ft)	2	53	43	22	99	0	21
Queue Length 95th (ft)	11	113	m89	186	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1802	195	2098	237	515	323
Starvation Cap Reductn	0	0	0	699	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.16	0.36	0.41	0.69	0.23	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	299	32	476	259	785	147	795
v/c Ratio	0.62	0.51	0.18	0.80	0.54	0.45	0.73	0.48
Control Delay	59.7	40.6	46.8	43.9	44.6	20.4	47.6	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	40.6	46.8	43.9	44.6	20.4	47.6	21.3
Queue Length 50th (ft)	44	42	17	108	60	182	92	193
Queue Length 95th (ft)	122	135	m49	187	121	290	149	279
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1022	193	761	481	1749	301	1646
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.29	0.17	0.63	0.54	0.45	0.49	0.48

Intersection Summary
m - Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	330	7	479	146	318
v/c Ratio	0.27	0.15	0.05	0.23	0.27	0.60
Control Delay	12.0	5.9	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	5.9	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	46	2	20	16	36
Queue Length 95th (ft)	m22	86	11	67	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2247	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.23	0.24	0.55

Intersection Summary
m - Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.39	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		285	834
Turn Bay Length (ft)						
Base Capacity (vph)	914	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1020	850
v/c Ratio	0.57	0.58	0.44	0.37
Control Delay	46.2	43.7	9.8	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.8	8.9
Queue Length 50th (ft)	58	76	154	118
Queue Length 95th (ft)	92	112	237	186
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	527	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.44	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	993	721	484	747
v/c Ratio	0.35	0.96	0.24	0.24
Control Delay	25.8	30.3	10.7	10.4
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	25.8	30.3	11.4	10.4
Queue Length 50th (ft)	92	235	81	86
Queue Length 95th (ft)	130	#486	111	110
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1299	813	1979	3054
Starvation Cap Reductn	0	0	1092	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.89	0.55	0.24

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	523	240	530
v/c Ratio	0.51	0.27	0.48	0.20
Control Delay	22.3	8.9	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	8.9	28.9	3.2
Queue Length 50th (ft)	41	63	50	24
Queue Length 95th (ft)	71	96	78	44
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1951	638	2689
Starvation Cap Reductn	0	0	0	1602
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.38	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	810	114	867	186	565	141	276	501
v/c Ratio	0.87	0.59	0.62	0.79	0.60	0.90	0.44	0.83	0.83
Control Delay	61.6	28.8	69.1	26.8	48.2	55.6	43.2	56.0	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	28.8	69.1	26.8	48.2	55.6	43.2	56.0	21.1
Queue Length 50th (ft)	194	237	77	280	130	204	88	185	73
Queue Length 95th (ft)	#330	316	m120	#433	m188	m#286	149	#299	#248
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	364	1374	225	1102	322	646	354	373	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.59	0.51	0.79	0.58	0.87	0.40	0.74	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	839	187	1061	197	969
v/c Ratio	0.79	0.70	0.83	0.70	0.69	0.82	0.83
Control Delay	45.5	33.7	34.6	58.7	29.5	72.7	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	33.7	34.6	58.7	29.5	72.7	28.6
Queue Length 50th (ft)	78	310	291	126	289	137	263
Queue Length 95th (ft)	m118	m333	290	#217	#520	#256	#470
Internal Link Dist (ft)		1290	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	181	1518	1391	274	1548	241	1527
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.53	0.60	0.68	0.69	0.82	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	390	156	177	699	21	475
v/c Ratio	0.88	0.39	0.80	0.72	0.12	0.71
Control Delay	42.2	16.2	45.7	18.2	22.8	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	16.2	45.7	18.2	22.8	20.4
Queue Length 50th (ft)	114	36	58	191	8	108
Queue Length 95th (ft)	#257	77	m#127	#444	m16	165
Internal Link Dist (ft)	663	1766		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	445	470	225	975	225	670
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.33	0.79	0.72	0.09	0.71

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	852	420	182	501
v/c Ratio	0.53	0.26	0.23	0.34
Control Delay	13.1	2.9	0.5	20.2
Queue Delay	2.4	0.4	0.7	0.0
Total Delay	15.5	3.3	1.2	20.2
Queue Length 50th (ft)	229	11	0	116
Queue Length 95th (ft)	191	m11	m0	157
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1612	1609	778	1475
Starvation Cap Reductn	603	701	337	0
Spillback Cap Reductn	120	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.46	0.41	0.34

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	163	37	513	659	214	339
v/c Ratio	0.67	0.05	0.59	0.45	0.23	0.80
Control Delay	24.9	0.3	29.0	2.1	19.2	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	0.3	29.0	2.1	19.2	17.6
Queue Length 50th (ft)	47	0	79	17	64	67
Queue Length 95th (ft)	65	1	67	13	167	164
Internal Link Dist (ft)	335			739	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	457	826	1155	1471	934	593
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	14	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.04	0.45	0.45	0.23	0.57

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	231	244	12	697	1282	274	614
v/c Ratio	0.56	1.15	0.21	0.71	0.74	0.12	0.83	0.81	0.83	0.74
Control Delay	42.8	130.8	27.4	37.1	37.7	46.3	38.4	4.6	43.6	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	130.8	27.4	37.1	37.7	46.3	38.4	4.6	43.6	27.4
Queue Length 50th (ft)	99	~287	21	129	137	7	193	0	147	249
Queue Length 95th (ft)	#202	#524	64	215	228	26	#322	0	#281	#573
Internal Link Dist (ft)		785			24		716			241
Turn Bay Length (ft)	230		50			190		135		
Base Capacity (vph)	333	350	314	456	459	267	926	1593	411	834
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.15	0.21	0.51	0.53	0.05	0.75	0.81	0.67	0.74

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1177	1119	776	359
v/c Ratio	0.47	0.45	0.80	0.80	0.84	0.52
Control Delay	45.8	4.5	13.5	15.0	41.1	5.2
Queue Delay	0.0	0.0	130.7	0.0	0.2	0.0
Total Delay	45.8	4.5	144.2	15.0	41.2	5.2
Queue Length 50th (ft)	97	61	343	515	265	0
Queue Length 95th (ft)	169	117	m352	m586	312	64
Internal Link Dist (ft)		816	296			
Turn Bay Length (ft)	340				190	
Base Capacity (vph)	322	2328	1476	1399	1124	760
Starvation Cap Reductn	0	0	562	0	0	0
Spillback Cap Reductn	0	6	0	0	35	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.45	1.29	0.80	0.71	0.47

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1051	1699	499	698	724	479
v/c Ratio	0.45	0.71	1.01	0.86	1.05	1.25	1.35
Control Delay	65.6	12.6	52.2	10.1	90.5	157.5	201.4
Queue Delay	0.0	1.5	106.2	0.4	8.6	1.9	1.7
Total Delay	65.6	14.1	158.4	10.5	99.1	159.4	203.1
Queue Length 50th (ft)	110	66	~401	60	~488	~656	~737
Queue Length 95th (ft)	m167	100	m#541	m73	#716	#910	#1088
Internal Link Dist (ft)		238	965			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	753	665	577	354
Starvation Cap Reductn	0	248	116	49	0	0	0
Spillback Cap Reductn	0	83	341	0	12	2	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.85	1.26	0.71	1.09	1.26	1.36

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	447	925	636	282	1075	177	78	82	72	401	854
v/c Ratio	0.84	0.92	0.90	1.03	1.01	0.36	0.38	0.38	0.27	0.81	0.71
Control Delay	60.5	40.4	21.7	108.6	69.5	26.9	50.2	50.5	24.8	37.4	6.0
Queue Delay	0.0	3.4	1.0	0.0	116.7	0.0	0.0	0.0	0.0	15.7	0.1
Total Delay	60.5	43.8	22.6	108.6	186.2	26.9	50.2	50.5	24.8	53.1	6.1
Queue Length 50th (ft)	168	272	277	~214	~408	79	63	66	20	204	24
Queue Length 95th (ft)	m177	m297	m331	#382	#554	141	116	121	68	#409	43
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	497	214	217	264	494	1206
Starvation Cap Reductn	0	40	11	0	0	0	0	0	85	30	
Spillback Cap Reductn	0	0	0	0	231	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.96	0.92	1.03	1.29	0.36	0.36	0.38	0.27	0.98	0.72

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1013	251
v/c Ratio	0.13	0.12	0.45	0.42	0.51	0.63	0.38
Control Delay	30.3	29.2	5.8	50.5	12.6	25.1	41.2
Queue Delay	1.3	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	31.6	29.2	6.5	50.5	12.6	25.1	41.2
Queue Length 50th (ft)	61	50	1	35	0	280	181
Queue Length 95th (ft)	102	82	131	73	52	350	281
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1734	241	307	1603	668
Starvation Cap Reductn	377	0	577	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.67	0.21	0.34	0.63	0.38

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	896	22	669	518	484	63	215	170
v/c Ratio	1.10	0.85	0.24	0.91	0.71	0.64	0.25	0.62	0.47
Control Delay	147.0	45.5	55.7	60.4	34.4	31.4	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	4.7	2.9	0.0	0.0	0.0
Total Delay	147.0	45.5	55.7	60.4	39.1	34.2	43.8	49.2	12.1
Queue Length 50th (ft)	~153	290	15	242	276	248	39	134	3
Queue Length 95th (ft)	#295	#467	42	#351	#516	457	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	167	1052	97	732	726	757	499	525	556
Starvation Cap Reductn	0	0	0	0	143	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.85	0.23	0.91	0.89	0.83	0.13	0.41	0.31

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	830	109	463	152	1189	122	1053
v/c Ratio	0.76	0.86	0.64	0.54	0.71	0.91	0.69	0.85
Control Delay	59.5	38.7	49.9	29.2	47.6	40.3	53.4	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	38.7	49.9	29.2	47.6	40.3	53.4	37.4
Queue Length 50th (ft)	78	221	60	110	83	~486	67	307
Queue Length 95th (ft)	#165	#320	113	156	145	#520	#137	#467
Internal Link Dist (ft)		207		2595		1987		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	981	197	976	256	1310	197	1236
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.85	0.55	0.47	0.59	0.91	0.62	0.85

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	831	87	640	29	198	232	182
v/c Ratio	0.26	0.53	0.57	0.36	0.04	0.69	0.74	0.65
Control Delay	48.1	24.1	57.5	19.2	9.7	41.0	33.2	39.3
Queue Delay	0.0	1.2	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	48.1	25.3	57.5	19.8	9.7	41.0	33.2	39.3
Queue Length 50th (ft)	16	183	53	97	0	123	114	109
Queue Length 95th (ft)	42	#413	#120	268	23	171	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1578	156	1843	803	478	492	492
Starvation Cap Reductn	0	469	0	789	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.76	0.55	0.61	0.04	0.41	0.47	0.37

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	717	153	541	166	197	297	125	179	388
v/c Ratio	0.39	0.56	0.74	0.36	0.23	0.93	0.67	0.27	0.87	0.90
Control Delay	46.8	27.8	56.6	22.2	4.7	91.1	37.9	6.2	74.2	42.8
Queue Delay	0.0	1.1	0.0	0.8	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.9	56.6	23.0	5.0	91.1	37.9	6.2	74.2	42.8
Queue Length 50th (ft)	31	188	94	124	0	126	171	0	116	239
Queue Length 95th (ft)	67	268	#177	192	45	#261	245	42	#233	290
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	185	1279	233	1522	736	212	560	530	212	551
Starvation Cap Reductn	0	320	0	641	243	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.66	0.61	0.34	0.93	0.55	0.24	0.84	0.79

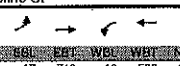
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	33	932	135	829	328	255	191
v/c Ratio	0.18	0.71	0.70	0.57	0.66	0.50	0.71
Control Delay	40.0	33.1	52.4	18.1	47.6	8.6	45.0
Queue Delay	0.0	10.9	0.0	0.3	0.0	0.0	0.0
Total Delay	40.0	44.0	52.4	18.5	47.6	8.6	45.0
Queue Length 50th (ft)	19	261	90	105	201	12	115
Queue Length 95th (ft)	47	#475	m56	m#284	#296	76	179
Internal Link Dist (ft)		247		271	894		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1304	301	1453	452	562	948
Starvation Cap Reductn	0	353	0	190	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.96	0.45	0.66	0.73	0.45	0.85

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

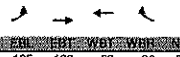
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	867	50	577	440	1051	241	1163
v/c Ratio	0.91	0.91	0.51	0.91	0.99	0.78	0.95	0.84
Control Delay	55.7	36.0	61.1	46.6	84.0	32.4	90.0	34.7
Queue Delay	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	55.7	38.5	61.1	46.6	84.0	32.4	90.0	35.5
Queue Length 50th (ft)	143	74	33	177	146	311	165	353
Queue Length 95th (ft)	m#242	#350	m71	#238	#246	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	254	980	107	680	446	1351	253	1378
Starvation Cap Reductn	0	36	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.94	0.47	0.85	0.99	0.78	0.95	0.88

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	719	10	583	276	377
v/c Ratio	0.10	0.32	0.07	0.27	0.49	0.68
Control Delay	20.6	6.4	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	6.4	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	94	5	26	35	36
Queue Length 95th (ft)	m7	m112	14	79	63	71
Internal Link Dist (ft)		416		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2219	248	2175	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.32	0.04	0.27	0.43	0.59

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.65	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		600	95		265	894
Turn Bay Length (ft)						
Base Capacity (vph)	779	761	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1276	1424
v/c Ratio	0.69	0.63	0.59	0.66
Control Delay	46.8	43.3	14.3	15.7
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.7	15.7
Queue Length 50th (ft)	90	88	250	300
Queue Length 95th (ft)	131	127	372	443
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2171	2166
Starvation Cap Reductn	0	0	395	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.72	0.66

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	905	1327
v/c Ratio	0.31	1.01	0.47	0.43
Control Delay	25.4	65.3	10.5	9.7
Queue Delay	0.1	0.0	3.9	0.1
Total Delay	25.5	65.3	15.4	9.8
Queue Length 50th (ft)	79	~273	134	131
Queue Length 95th (ft)	111	#497	177	161
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	589	1945	3103
Starvation Cap Reductn	0	0	956	0
Spillback Cap Reductn	148	0	0	582
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.01	0.92	0.52

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	933	643	771
v/c Ratio	0.92	0.60	0.82	0.31
Control Delay	44.3	26.2	43.5	6.6
Queue Delay	0.3	0.7	12.7	1.8
Total Delay	44.6	27.0	56.2	8.5
Queue Length 50th (ft)	218	254	223	94
Queue Length 95th (ft)	272	376	270	138
Internal Link Dist (ft)	999	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	802	1565	967	2515
Starvation Cap Reductn	0	0	306	1530
Spillback Cap Reductn	33	310	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.74	0.97	0.78

Intersection Summary

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	937	361	346	431
v/c Ratio	0.54	0.24	0.42	0.32
Control Delay	7.9	12.7	7.0	22.3
Queue Delay	1.7	0.0	2.7	0.0
Total Delay	9.6	12.7	9.7	22.3
Queue Length 50th (ft)	38	85	164	105
Queue Length 95th (ft)	48	m90	m209	144
Internal Link Dist (ft)	942	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1730	1480	825	1350
Starvation Cap Reductn	588	0	356	0
Spillback Cap Reductn	101	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	0.24	0.74	0.32

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St

Existing Plus Alt#2 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	301	55	717	864	245	237
v/c Ratio	0.80	0.06	0.74	0.65	0.33	0.23
Control Delay	19.4	0.1	15.6	14.6	27.0	6.4
Queue Delay	0.1	0.0	0.0	1.3	0.0	0.0
Total Delay	19.5	0.1	15.6	16.0	27.0	6.4
Queue Length 50th (ft)	64	1	144	598	122	45
Queue Length 95th (ft)	76	0	m223	725	218	88
Internal Link Dist (ft)	342			793	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	963	1186	1329	738	1150
Starvation Cap Reductn	8	0	0	260	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.06	0.60	0.81	0.33	0.21

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd

Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	398	386	45	267	909	130	461
v/c Ratio	0.18	0.14	0.08	0.69	0.67	0.27	0.28	0.57	0.53	0.72
Control Delay	35.7	35.5	20.7	27.1	26.4	34.9	22.1	1.5	31.9	25.2
Queue Delay	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.1
Total Delay	35.7	35.5	20.7	27.5	26.7	34.9	22.1	1.5	31.9	25.3
Queue Length 50th (ft)	13	11	0	181	172	21	52	0	61	195
Queue Length 95th (ft)	39	34	13	#349	#331	54	93	0	115	#366
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	383	403	349	673	674	366	1248	1583	505	794
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	4	47	47	0	0	0	0	22
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.02	0.64	0.62	0.12	0.21	0.57	0.26	0.60

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd

Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	609	886	938	263
v/c Ratio	0.88	0.14	0.40	0.63	0.88	0.39
Control Delay	51.4	10.0	14.1	11.3	36.9	3.8
Queue Delay	0.0	0.0	1.4	0.0	3.7	0.0
Total Delay	51.4	10.0	15.5	11.3	40.6	3.8
Queue Length 50th (ft)	85	42	140	362	524	0
Queue Length 95th (ft)	141	76	222	561	355	51
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2176	1526	1399	1592	675
Starvation Cap Reductn	0	0	676	0	158	0
Spillback Cap Reductn	0	105	0	0	548	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.14	0.72	0.63	0.90	0.39

Intersection Summary

Queues
1013: Powell St & I-80 EB Off-Ramp

Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1114	1090	451	404	573	550
v/c Ratio	0.74	0.93	0.65	0.55	0.58	0.72	1.40
Control Delay	66.2	35.2	30.9	7.9	26.5	17.7	216.4
Queue Delay	0.0	118.6	0.2	0.2	0.1	0.0	0.0
Total Delay	66.2	153.8	31.1	8.1	26.6	17.7	216.4
Queue Length 50th (ft)	86	305	261	83	217	176	~881
Queue Length 95th (ft)	128	#366	324	m132	320	334	#774
Internal Link Dist (ft)		215	365		1446		
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1681	815	734	798	394
Starvation Cap Reductn	0	319	126	46	0	0	0
Spillback Cap Reductn	0	0	30	0	14	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.27	0.70	0.59	0.56	0.72	1.40

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	485	1109	620	293	480	160	153	161	110	446	801
v/c Ratio	0.82	0.95	1.01	1.07	0.45	0.31	0.84	0.86	0.42	0.89	0.60
Control Delay	58.8	31.7	36.9	119.0	32.9	14.4	91.5	93.8	26.5	45.8	17.8
Queue Delay	0.2	1.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0	34.5	0.4
Total Delay	59.0	33.7	38.2	119.0	32.9	14.5	91.5	93.8	26.5	80.3	18.3
Queue Length 50th (ft)	176	233	~201	~230	144	33	121	127	25	282	90
Queue Length 95th (ft)	m185	m248	m#388	#401	193	87	m#235	m#249	m69	#483	126
Internal Link Dist (ft)		385			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1160	616	274	1062	524	183	188	261	499	1344
Starvation Cap Reductn	0	21	3	0	0	0	0	0	0	79	178
Spillback Cap Reductn	4	0	0	0	0	18	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.97	1.01	1.07	0.45	0.32	0.84	0.86	0.42	1.06	0.69

Intersection Summary
~: Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
#: 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m: Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBR	NBL	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1360	302
v/c Ratio	0.20	0.30	0.79	0.44	0.56	0.89	0.46
Control Delay	31.1	30.2	32.8	50.5	12.1	22.3	33.1
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.0	0.0
Total Delay	32.4	30.9	34.8	50.5	12.6	22.3	33.1
Queue Length 50th (ft)	64	67	253	39	0	488	199
Queue Length 95th (ft)	135	117	381	78	57	588	307
Internal Link Dist (ft)		150				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1637	656
Starvation Cap Reductn	307	669	355	0	0	0	0
Spillback Cap Reductn	11	0	0	0	37	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.44	0.87	0.23	0.46	0.83	0.46

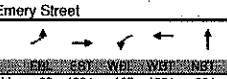
Intersection Summary

Queues
1016: Powell St & Hollis Street
Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	663	40	660	197	187	38	190	97
v/c Ratio	0.59	0.41	0.35	0.47	0.59	0.53	0.12	0.56	0.27
Control Delay	52.3	16.4	38.4	20.9	24.7	22.8	20.8	24.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	16.4	38.4	20.9	24.7	22.8	20.8	24.2	6.8
Queue Length 50th (ft)	26	75	14	107	64	56	11	61	0
Queue Length 95th (ft)	#93	#185	44	#211	129	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	122	1602	115	1443	445	465	443	466	491
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.41	0.35	0.46	0.44	0.40	0.09	0.41	0.21

Intersection Summary
#: 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street
Existing Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1004	165	1024	204	197	59
v/c Ratio	0.32	0.61	1.04	0.50	0.72	0.48	0.24
Control Delay	62.5	13.6	106.6	13.2	42.4	7.0	27.7
Queue Delay	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Delay	62.5	13.6	106.6	14.2	42.4	7.0	27.7
Queue Length 50th (ft)	13	94	~117	65	126	0	27
Queue Length 95th (ft)	m20	#510	m#176	m#413	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	82	1659	159	2032	441	500	445
Starvation Cap Reductn	0	0	0	683	0	0	0
Spillback Cap Reductn	0	44	0	0	0	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.62	1.04	0.76	0.46	0.37	0.13

Intersection Summary
~: Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
#: 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m: Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue — Existing Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	904	75	519	496	728	123	943
v/c Ratio	0.60	0.61	0.74	0.61	0.92	0.57	0.68	0.91
Control Delay	63.6	16.5	80.7	36.5	63.1	28.0	50.5	45.3
Queue Delay	0.0	1.0	0.0	0.6	4.3	0.0	0.0	0.1
Total Delay	63.6	17.4	80.7	37.0	67.4	28.0	50.5	45.4
Queue Length 50th (ft)	83	255	48	153	161	192	77	292
Queue Length 95th (ft)	#217	#40	#121	211	#254	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1114	105	848	549	1278	239	1041
Starvation Cap Reductn	0	62	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	25	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.86	0.71	0.69	0.96	0.57	0.51	0.91

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5:00 pm Baseline
Fehr & Peers Associates, Inc.
Synchro 6 Report
Page 10

SYNCHRO QUEUE SHEETS
ALTERNATIVE #2
2010

Queues
1001: Ashby (SR 13) & Seventh St — Marketplace Redevelopment, 2010 Plus Alt#2 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1236	109	813	121	299	64	223	208
v/c Ratio	0.97	0.73	0.64	0.86	0.57	0.69	0.24	0.79	0.50
Control Delay	67.5	25.9	51.9	58.0	51.6	46.2	41.8	56.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	25.9	51.9	58.0	51.6	46.2	41.8	56.5	9.2
Queue Length 50th (ft)	374	458	79	421	82	97	40	151	0
Queue Length 95th (ft)	#593	478	m120	#464	140	141	79	#241	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	265		175				110		
Base Capacity (vph)	569	1686	193	948	257	822	308	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.73	0.56	0.86	0.47	0.57	0.21	0.69	0.47

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1/29/2007
Fehr & Peers Associates, Inc.
Synchro 6 Report
Page 1

Queues
1002: Ashby (SR 13) & San Pablo Avenue — Marketplace Redevelopment, 2010 Plus Alt#2 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	756	204	753	124	949	
v/c Ratio	0.76	0.73	0.79	0.83	0.54	0.48	0.67	
Control Delay	23.2	16.5	32.7	68.5	26.5	50.2	31.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	23.2	16.5	32.7	68.5	26.5	50.2	31.1	
Queue Length 50th (ft)	24	61	234	141	215	82	289	
Queue Length 95th (ft)	m31	88	272	#258	311	142	#439	
Internal Link Dist (ft)		1290	1505		696		1468	
Turn Bay Length (ft)	125			165		120		
Base Capacity (vph)	213	1522	1200	257	1395	257	1410	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.60	0.58	0.63	0.79	0.54	0.48	0.67	

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1/29/2007
Fehr & Peers Associates, Inc.
Synchro 6 Report
Page 2

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	46	69	85	167	233	125	255
v/c Ratio	0.07	0.07	0.13	0.18	0.66	0.29	0.38
Control Delay	11.1	10.2	8.8	2.9	20.9	12.4	8.6
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	11.1	10.2	8.8	3.2	20.9	12.4	8.6
Queue Length 50th (ft)	9	12	13	9	68	28	41
Queue Length 95th (ft)	28	36	34	26	118	48	72
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	616	943	677	908	595	453	988
Starvation Cap Reductn	0	0	0	383	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.13	0.32	0.39	0.28	0.26

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	248	26	191	73
v/c Ratio	0.16	0.03	0.12	0.35
Control Delay	1.9	2.3	2.2	21.5
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	2.2	2.3	2.2	21.5
Queue Length 50th (ft)	16	2	13	21
Queue Length 95th (ft)	39	7	31	52
Internal Link Dist (ft)	114		663	749
Turn Bay Length (ft)				
Base Capacity (vph)	1563	893	1589	780
Starvation Cap Reductn	783	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.03	0.12	0.09

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	279	123	38	323	24	542
v/c Ratio	0.71	0.41	0.19	0.29	0.14	0.53
Control Delay	25.6	21.9	16.4	7.8	20.9	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	21.9	16.4	7.8	20.9	11.3
Queue Length 50th (ft)	51	31	10	30	7	61
Queue Length 95th (ft)	#147	70	27	137	23	#219
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	991	900	289	1109	283	1021
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.41	0.13	0.29	0.08	0.53

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	169	178	62	267	300	367
v/c Ratio	0.65	0.59	0.77	0.71	0.09	0.11	0.26	0.16
Control Delay	72.9	20.3	74.0	68.9	0.4	0.4	1.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	72.9	20.3	74.0	68.9	0.4	0.4	1.8	6.3
Queue Length 50th (ft)	45	0	132	118	1	1	2	41
Queue Length 95th (ft)	#112	56	#228	#198	m1	m1	m43	59
Internal Link Dist (ft)	75			935		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	106	211	269	273	669	2389	1166	2226
Starvation Cap Reductn	0	0	0	0	0	0	491	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.70	0.65	0.09	0.11	0.44	0.16

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	255	45	266	232	82	152
v/c Ratio	0.80	0.08	0.70	0.17	0.07	0.37
Control Delay	52.2	22.3	36.9	1.5	10.5	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	22.3	36.9	1.5	10.5	7.8
Queue Length 50th (ft)	176	12	58	4	22	0
Queue Length 95th (ft)	#258	m46	117	6	48	51
Internal Link Dist (ft)	335			739	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	931	1236	1378	1096	453
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.05	0.22	0.17	0.07	0.34

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	397	418	93	91	846	80	323
v/c Ratio	0.03	0.13	0.11	0.61	0.69	0.44	0.09	0.53	0.40	0.66
Control Delay	35.6	36.0	18.2	25.0	25.5	33.0	19.5	1.3	32.7	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	36.0	18.2	25.0	25.5	33.0	19.5	1.3	32.7	23.1
Queue Length 50th (ft)	2	9	0	151	161	39	15	0	34	123
Queue Length 95th (ft)	14	35	20	#367	#392	93	35	0	83	225
Internal Link Dist (ft)		786			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	401	422	371	731	740	389	1339	1583	500	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.54	0.56	0.24	0.07	0.53	0.16	0.42

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	727	1020	845	136
v/c Ratio	0.37	0.20	0.53	0.71	0.85	0.25
Control Delay	39.1	4.8	18.4	10.6	35.1	4.8
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	39.1	4.8	19.0	10.6	35.2	4.8
Queue Length 50th (ft)	70	27	101	415	280	0
Queue Length 95th (ft)	126	57	m183	m641	300	38
Internal Link Dist (ft)		816	236			
Turn Bay Length (ft)	340				190	
Base Capacity (vph)	336	2152	1361	1441	1373	715
Starvation Cap Reductn	0	0	300	0	0	0
Spillback Cap Reductn	0	1	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.69	0.71	0.63	0.19

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	995	1104	365	584	684	672
v/c Ratio	0.24	0.42	0.74	0.48	0.91	1.08	0.94
Control Delay	25.2	9.1	17.1	2.5	50.8	84.3	47.4
Queue Delay	0.0	2.1	0.2	0.1	0.0	11.0	7.9
Total Delay	25.2	11.1	17.3	2.6	50.8	95.4	55.2
Queue Length 50th (ft)	17	153	124	0	366	~476	388
Queue Length 95th (ft)	m43	139	161	m17	#591	#721	#649
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	765	639	635	713
Starvation Cap Reductn	0	1198	0	40	0	0	0
Spillback Cap Reductn	0	156	49	0	0	16	35
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.83	0.77	0.51	0.91	1.11	0.99

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	525	1375	389	79	782	116	23	24	44	212	651
v/c Ratio	0.77	0.99	0.41	0.61	0.82	0.26	0.19	0.20	0.28	0.39	0.43
Control Delay	49.2	37.0	1.5	60.1	42.5	22.6	43.8	43.9	15.3	35.4	4.2
Queue Delay	0.0	12.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Total Delay	49.2	49.8	1.7	60.1	42.5	22.6	43.8	43.9	15.3	36.5	4.2
Queue Length 50th (ft)	171	#833	8	49	245	42	14	16	0	103	2
Queue Length 95th (ft)	m#221	m#617	m13	#106	318	89	40	41	32	m165	71
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	678	1395	937	142	956	450	185	186	213	538	1501
Starvation Cap Reductn	0	64	113	0	0	0	0	0	0	156	27
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.03	0.47	0.56	0.82	0.26	0.12	0.13	0.21	0.55	0.44

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	512	133
v/c Ratio	0.07	0.07	0.23	0.22	0.13
Control Delay	26.1	25.7	2.6	7.6	10.3
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.1	25.7	3.4	7.6	10.3
Queue Length 50th (ft)	14	14	1	64	39
Queue Length 95th (ft)	38	31	24	87	53
Internal Link Dist (ft)		119		820	739
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1169	2278	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.22	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	736	38	581	271	248	29	212	108
v/c Ratio	0.87	0.46	0.29	0.72	0.82	0.71	0.11	0.74	0.32
Control Delay	56.3	19.1	46.7	40.5	45.7	41.1	26.0	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	19.1	46.7	40.5	45.7	41.1	26.0	38.9	10.3
Queue Length 50th (ft)	255	150	23	176	180	148	18	131	
Queue Length 95th (ft)	#538	242	55	238	259	231	30	152	40
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	475	1605	159	809	407	426	272	891	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.46	0.24	0.72	0.67	0.58	0.08	0.54	0.26

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	400	105	479	134	634	52	872
v/c Ratio	0.80	0.59	0.62	0.71	0.65	0.55	0.41	0.54
Control Delay	87.5	32.6	51.1	38.3	46.2	15.8	45.9	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	32.6	51.1	38.3	46.2	15.8	45.9	22.0
Queue Length 50th (ft)	63	105	65	151	83	117	32	196
Queue Length 95th (ft)	#154	147	118	191	137	192	69	316
Internal Link Dist (ft)		207		2505		1967		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	897	212	1058	301	1834	230	1628
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.45	0.50	0.45	0.45	0.35	0.23	0.54

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	362	45	365	186	69	197	88
v/c Ratio	0.24	0.20	0.37	0.18	0.19	0.27	0.74	0.37
Control Delay	47.9	15.0	49.9	14.5	4.0	37.5	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	15.0	49.9	14.5	4.0	37.5	40.7	36.0
Queue Length 50th (ft)	16	54	28	49	0	40	116	50
Queue Length 95th (ft)	42	131	62	136	49	76	180	81
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1844	138	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.33	0.18	0.19	0.14	0.40	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	336	55	555	194	138	274	41	121	204
v/c Ratio	0.27	0.20	0.42	0.91	0.22	0.68	0.64	0.10	0.85	0.56
Control Delay	46.8	17.5	48.9	18.4	4.2	49.0	35.1	7.4	91.9	30.9
Queue Delay	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.5	48.9	19.2	4.7	49.0	35.1	7.4	91.9	30.9
Queue Length 50th (ft)	18	52	34	100	0	85	121	0	93	97
Queue Length 95th (ft)	46	115	71	196	47	144	206	23	#188	116
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1640	184	1783	894	286	671	586	142	538
Starvation Cap Reductn	0	0	0	876	380	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.20	0.34	0.61	0.38	0.52	0.41	0.07	0.85	0.30

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	460	128	713	247	127	38
v/c Ratio	0.04	0.26	0.67	0.32	0.79	0.34	0.25
Control Delay	47.3	18.0	57.2	6.6	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.3	57.2	6.8	42.7	7.2	36.5
Queue Length 50th (ft)	2	84	82	16	153	0	21
Queue Length 95th (ft)	11	174	m120	m231	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1754	210	2227	487	520	329
Starvation Cap Reductn	0	676	0	726	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.43	0.61	0.48	0.51	0.24	0.12

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	439	34	652	314	834	168	974
v/c Ratio	0.63	0.57	0.20	0.90	0.65	0.53	0.77	0.64
Control Delay	61.0	31.1	47.2	48.0	47.8	24.4	49.1	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.0	31.1	47.2	48.0	47.8	24.4	49.1	26.8
Queue Length 50th (ft)	44	54	17	162	98	214	105	269
Queue Length 95th (ft)	120	184	m49	#266	144	316	168	368
Internal Link Dist (ft)		271		416		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1034	181	789	481	1578	401	1511
Starvation Cap Reductn	0	0	0	0	0	0	0	68
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.42	0.19	0.83	0.65	0.53	0.56	0.67

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	429	82	642	240	394
v/c Ratio	0.26	0.22	0.44	0.31	0.40	0.73
Control Delay	16.1	8.8	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	8.8	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	19	79	23	30	25	51
Queue Length 95th (ft)	m28	115	55	93	51	#104
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2044	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.22	0.39	0.31	0.39	0.71

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.61	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	29	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	656	594	1096	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1133	1098
v/c Ratio	0.77	0.74	0.54	0.53
Control Delay	54.3	46.4	14.4	14.1
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.7	14.1
Queue Length 50th (ft)	94	136	231	220
Queue Length 95th (ft)	#144	185	303	289
Internal Link Dist (ft)		922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	369	631	2065	2079
Starvation Cap Reductn	0	0	371	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.66	0.53

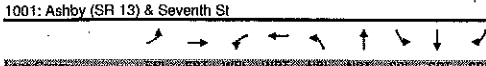
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	549	1055
v/c Ratio	0.44	0.98	0.90	0.37
Control Delay	25.3	45.4	12.4	12.8
Queue Delay	0.0	0.0	1.5	0.0
Total Delay	25.3	45.4	13.9	12.8
Queue Length 50th (ft)	136	315	94	191
Queue Length 95th (ft)	184	#582	127	161
Internal Link Dist (ft)	989		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	780	1825	2843
Starvation Cap Reductn	0	0	1047	0
Spillback Cap Reductn	14	0	0	55
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.97	0.71	0.38

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	586	457	620
v/c Ratio	0.68	0.36	0.75	0.26
Control Delay	25.3	13.5	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.5
Total Delay	25.3	13.5	34.4	5.1
Queue Length 50th (ft)	93	80	96	42
Queue Length 95th (ft)	130	131	#143	75
Internal Link Dist (ft)	399	1873		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1611	638	2462
Starvation Cap Reductn	0	0	0	1352
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.37	0.72	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

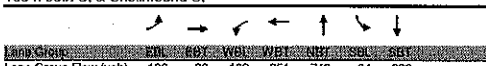


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1017	146	974	199	605	146	323	509
v/c Ratio	0.90	0.80	0.72	0.96	0.62	0.94	0.49	0.90	0.84
Control Delay	67.1	36.4	60.9	48.1	49.0	62.5	42.8	66.6	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.4	60.9	48.1	49.0	62.5	42.8	66.6	23.8
Queue Length 50th (ft)	210	336	99	~390	140	220	91	223	89
Queue Length 95th (ft)	#361	423	m112	m#435	m185	m#304	154	#378	#272
Internal Link Dist (ft)		1600		1293		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1277	225	1016	322	646	354	373	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.65	0.96	0.62	0.94	0.41	0.87	0.82

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	911	284	1226	196	1238	
v/c Ratio	1.33	0.62	0.80	1.04	1.10	0.81	1.18	
Control Delay	207.6	25.8	32.5	110.4	93.3	72.2	125.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	207.6	25.8	32.5	110.4	93.3	72.2	125.5	
Queue Length 50th (ft)	~194	314	278	~217	~516	136	~549	
Queue Length 95th (ft)	m#275	m375	367	#386	#653	#257	#686	
Internal Link Dist (ft)		1299	1505		696		1468	
Turn Bay Length (ft)	125			185		120		
Base Capacity (vph)	156	1517	1138	274	1118	241	1050	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.33	0.62	0.80	1.04	1.10	0.81	1.18	

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	106	89	162	351	749	94	296
v/c Ratio	0.62	0.15	0.38	0.53	0.94	0.24	0.30
Control Delay	32.4	16.6	25.4	17.3	30.4	8.4	6.2
Queue Delay	0.0	0.0	0.9	1.3	0.5	0.0	0.0
Total Delay	32.4	16.6	26.3	19.2	31.0	8.4	6.2
Queue Length 50th (ft)	53	23	55	67	218	13	37
Queue Length 95th (ft)	#100	53	110	150	#433	28	70
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	202	602	423	662	841	385	1082
Starvation Cap Reductn	0	0	102	172	0	0	0
Spillback Cap Reductn	0	0	0	0	10	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.15	0.50	0.72	0.90	0.25	0.27

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	424	35	394	141
v/c Ratio	0.32	0.07	0.29	0.54
Control Delay	1.5	3.4	3.9	20.6
Queue Delay	1.4	0.0	0.1	0.0
Total Delay	2.9	3.4	4.0	20.6
Queue Length 50th (ft)	8	9	90	42
Queue Length 95th (ft)	m10	11	82	83
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1346	523	1352	770
Starvation Cap Reductn	705	0	0	0
Spillback Cap Reductn	0	0	195	8
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.07	0.34	0.19

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	469	175	172	738	20	559
v/c Ratio	1.07	0.38	0.76	0.76	0.12	0.83
Control Delay	85.3	17.2	44.3	20.0	22.7	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.3	17.2	44.3	20.0	22.7	25.7
Queue Length 50th (ft)	~175	41	56	205	8	128
Queue Length 95th (ft)	#329	86	m#128	#476	m14	m#200
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	440	468	225	972	225	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.38	0.76	0.76	0.09	0.83

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	416	394	144	413	185	493
v/c Ratio	0.17	0.54	0.55	0.53	0.52	0.30	0.28	0.40
Control Delay	50.6	16.8	9.6	8.6	39.4	20.2	4.5	24.9
Queue Delay	0.0	0.3	1.3	1.1	0.0	0.4	0.4	0.0
Total Delay	50.6	17.1	10.9	9.7	39.4	20.6	4.9	24.9
Queue Length 50th (ft)	12	0	95	86	98	58	12	126
Queue Length 95th (ft)	35	52	135	118	m58	m74	m23	172
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	748	278	1358	671	1238
Starvation Cap Reductn	0	0	155	153	0	507	195	0
Spillback Cap Reductn	0	10	165	162	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.48	0.71	0.67	0.52	0.49	0.39	0.40

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	187	39	471	708	217	341
v/c Ratio	0.71	0.06	0.55	0.48	0.21	0.82
Control Delay	30.9	0.6	44.3	1.5	16.5	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	0.6	44.3	1.5	16.5	18.0
Queue Length 50th (ft)	59	0	127	5	75	70
Queue Length 95th (ft)	114	2	165	17	162	165
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	820	1155	1480	1018	592
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.05	0.41	0.48	0.21	0.58

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	369	63	319	339	12	724	1402	283	634
v/c Ratio	0.59	1.21	0.22	0.82	0.86	0.13	0.88	0.89	0.88	0.78
Control Delay	46.7	154.9	28.6	44.4	46.0	47.6	44.9	8.6	48.3	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	154.9	28.6	44.4	46.0	47.6	44.9	8.6	49.3	31.4
Queue Length 50th (ft)	109	~921	23	195	207	7	234	0	170	310
Queue Length 95th (ft)	#193	#506	62	#328	#350	26	#342	#16	#294	#603
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	306	322	291	445	447	241	868	1583	387	810
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.21	0.22	0.72	0.74	0.05	0.83	0.89	0.73	0.78

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1268	1165	982	347
v/c Ratio	0.46	0.47	0.95dr	0.93	0.91	0.50
Control Delay	45.4	5.2	18.5	17.2	46.0	8.5
Queue Delay	0.0	0.0	178.6	0.0	3.8	0.0
Total Delay	45.4	5.2	197.1	17.2	49.8	8.5
Queue Length 50th (ft)	94	71	410	654	335	29
Queue Length 95th (ft)	158	114	m362	m550	#445	106
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2210	1381	1399	1124	711
Starvation Cap Reductn	0	0	476	0	0	0
Spillback Cap Reductn	0	16	0	0	85	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.40	0.83	0.95	0.49

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1256	1834	431	601	809	570
v/c Ratio	0.44	0.84	1.09	0.57	1.06	1.37	1.66
Control Delay	64.7	15.0	77.4	6.2	92.1	208.3	332.0
Queue Delay	0.0	14.9	139.5	0.3	30.5	29.6	73.7
Total Delay	64.7	29.9	216.9	6.5	122.7	235.8	405.7
Queue Length 50th (ft)	108	82	~568	33	~493	~772	~991
Queue Length 95th (ft)	m140	100	m#534	m31	#723	#1036	#959
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	336	1489	1687	761	565	588	344
Starvation Cap Reductn	0	158	106	57	0	0	0
Spillback Cap Reductn	0	247	379	0	36	27	31
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.01	1.40	0.61	1.14	1.44	1.82

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	501	1124	771	342	1238	253	76	80	69	435	776
v/c Ratio	0.94	1.11	1.10	1.25	1.16	0.50	0.36	0.37	0.26	0.88	0.64
Control Delay	60.2	89.3	70.3	174.6	119.7	33.1	50.0	50.4	25.1	54.9	11.0
Queue Delay	0.0	21.7	6.6	0.0	190.5	0.0	0.0	0.0	0.0	34.2	0.1
Total Delay	60.2	111.0	76.9	174.6	310.2	33.1	50.0	50.4	25.1	89.0	11.1
Queue Length 50th (ft)	191	~491	~450	~296	~532	146	61	64	19	324	165
Queue Length 95th (ft)	m178	m#404	m#367	#494	#897	241	113	118	66	#475	119
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1011	700	274	1062	503	214	217	262	493	1209
Starvation Cap Reductn	0	44	10	0	0	0	0	0	0	52	46
Spillback Cap Reductn	0	0	0	0	285	0	0	0	0	0	14
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.16	1.12	1.25	1.59	0.50	0.36	0.37	0.26	1.06	0.67

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1182	256
v/c Ratio	0.17	0.17	0.45	0.67	0.42
Control Delay	33.2	32.0	7.8	15.5	42.0
Queue Delay	2.3	1.3	0.4	0.0	0.0
Total Delay	35.5	33.3	8.3	15.5	42.0
Queue Length 50th (ft)	61	64	73	255	179
Queue Length 95th (ft)	118	104	134	317	266
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1919	2069	610
Starvation Cap Reductn	352	752	548	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.63	0.57	0.42

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1095	21	796	522	565	72	256	160
v/c Ratio	1.24	1.06	0.23	1.09	0.77	0.80	0.24	0.80	0.40
Control Delay	197.5	77.8	55.4	100.2	40.1	41.1	47.3	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	3.8	7.6	0.0	0.0	0.0
Total Delay	197.5	77.8	55.4	100.2	43.9	48.7	47.3	54.1	15.9
Queue Length 50th (ft)	~182	293	15	~331	297	330	51	167	19
Queue Length 95th (ft)	#333	#627	41	#457	#562	#613	100	273	86
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1036	97	733	677	707	499	525	549
Starvation Cap Reductn	0	0	0	0	89	108	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.06	0.22	1.09	0.89	0.94	0.14	0.49	0.29

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	899	107	557	188	1408	118	1256
v/c Ratio	0.83	0.91	0.64	0.64	0.80	1.09	0.67	1.07
Control Delay	69.8	44.0	49.4	31.3	55.8	84.8	52.2	80.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	44.0	49.4	31.3	55.8	84.8	52.2	80.2
Queue Length 50th (ft)	90	250	59	139	104	~526	65	~466
Queue Length 95th (ft)	#194	#389	112	192	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	993	197	877	258	1288	197	1170
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.91	0.54	0.67	0.73	1.09	0.60	1.07

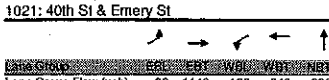
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	902	84	708	58	227	270	313
v/c Ratio	0.26	0.66	0.58	0.46	0.08	0.73	0.80	0.84
Control Delay	48.8	30.6	58.8	25.4	8.4	41.2	36.0	43.2
Queue Delay	0.0	2.3	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	33.0	58.8	25.9	8.4	41.2	36.0	43.2
Queue Length 50th (ft)	17	246	52	173	0	190	140	191
Queue Length 95th (ft)	44	#486	#127	#327	32	196	206	266
Internal Link Dist (ft)		240		256			303	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1365	152	1542	693	478	491	494
Starvation Cap Reductn	0	320	0	401	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.86	0.55	0.62	0.08	0.47	0.55	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	842	148	614	216	220	341	140	262	508
v/c Ratio	0.39	0.75	0.74	0.49	0.30	1.04	0.64	0.26	1.24	0.97
Control Delay	46.8	35.2	56.0	24.4	4.6	116.6	37.3	6.0	174.2	60.7
Queue Delay	0.0	6.6	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	41.8	56.0	25.4	4.9	116.6	37.3	6.0	174.2	60.7
Queue Length 50th (ft)	30	252	91	197	0	~152	189	0	~210	319
Queue Length 95th (ft)	64	328	#168	220	50	#297	285	44	#373	#468
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1120	230	1419	728	212	540	540	212	533
Starvation Cap Reductn	0	230	0	536	195	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.95	0.64	0.70	0.41	1.04	0.63	0.26	1.24	0.95

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

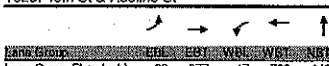


Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1146	166	948	936	301	193
v/c Ratio	0.18	0.93	0.75	0.66	0.87	0.56	0.72
Control Delay	39.9	47.4	49.6	19.9	48.4	9.2	45.1
Queue Delay	0.0	87.7	0.0	0.6	0.0	1.7	3.3
Total Delay	39.9	135.1	49.6	20.5	48.4	10.9	48.4
Queue Length 50th (ft)	18	~363	109	130	205	17	116
Queue Length 95th (ft)	46	#656	m59	m271	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	246	1232	301	1446	452	589	349
Starvation Cap Reductn	0	276	0	190	0	0	0
Spillback Cap Reductn	0	166	0	0	0	160	83
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.20	0.55	0.75	0.74	0.69	0.73

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1093	49	696	505	1282	281	1343
v/c Ratio	0.92	1.08	0.51	1.03	1.13	0.98	1.08	1.00
Control Delay	49.4	76.4	59.7	76.4	124.6	52.7	123.1	55.0
Queue Delay	0.0	15.2	0.0	0.0	17.7	0.0	0.0	13.0
Total Delay	49.4	91.7	59.7	76.4	142.3	52.7	123.1	68.0
Queue Length 50th (ft)	112	~382	32	~239	~193	418	~210	453
Queue Length 95th (ft)	m#131	m#440	m65	#330	#296	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1008	106	676	448	1307	259	1349
Starvation Cap Reductn	0	33	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	16	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.12	0.46	1.03	1.17	0.98	1.08	1.04

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	877	47	700	440	450
v/c Ratio	0.14	0.44	0.26	0.33	0.66	0.83
Control Delay	20.7	9.3	22.0	5.9	19.6	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	9.3	22.0	5.9	19.6	26.2
Queue Length 50th (ft)	9	126	13	35	50	51
Queue Length 95th (ft)	m9	m141	36	101	88	#117
Internal Link Dist (ft)		418		1192	922	269
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	248	2115	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.19	0.33	0.64	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	#4	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	748	924
Starvation Cap Reductn	0	0	0	0	96	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1599	1679
v/c Ratio	1.08	0.74	0.81	0.85
Control Delay	107.2	47.0	23.0	25.0
Queue Delay	0.0	0.0	2.5	0.0
Total Delay	107.2	47.0	25.5	25.0
Queue Length 50th (ft)	~197	129	436	478
Queue Length 95th (ft)	#306	180	555	609
Internal Link Dist (ft)		922	9	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1974
Starvation Cap Reductn	0	0	252	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.93	0.85

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1092	1614
v/c Ratio	0.46	1.39	0.66	0.52
Control Delay	27.1	211.1	13.8	10.7
Queue Delay	0.3	0.0	30.3	0.9
Total Delay	27.4	211.1	44.1	11.0
Queue Length 50th (ft)	113	~545	194	174
Queue Length 95th (ft)	159	#769	262	210
Internal Link Dist (ft)	983		192	399
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	555	1667	3103
Starvation Cap Reductn	0	0	618	0
Spillback Cap Reductn	158	0	0	790
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.39	1.05	0.70

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1067	788	908
v/c Ratio	0.96	0.82	0.88	0.38
Control Delay	61.0	37.5	46.6	8.5
Queue Delay	27.8	46.4	145.2	4.9
Total Delay	88.7	83.8	191.8	13.4
Queue Length 50th (ft)	308	367	269	134
Queue Length 95th (ft)	#437	#470	341	168
Internal Link Dist (ft)	399	1670		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1327	967	2384
Starvation Cap Reductn	0	0	370	1390
Spillback Cap Reductn	92	334	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.09	1.32	0.91

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1004: 65th Street & Shellmound St
2010 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	76	64	147	172	739	90	404
v/c Ratio	0.20	0.11	0.54	0.28	0.92	0.27	0.40
Control Delay	19.1	14.5	23.3	12.4	27.6	7.2	8.0
Queue Delay	0.0	0.0	3.2	1.4	0.5	0.0	0.0
Total Delay	19.1	14.5	26.4	13.8	28.1	7.2	8.0
Queue Length 50th (ft)	21	14	47	24	208	12	81
Queue Length 95th (ft)	52	39	95	69	#419	27	106
Internal Link Dist (ft)		499		63	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	376	593	492	619	853	335	1107
Starvation Cap Reductn	0	0	198	289	0	0	0
Spillback Cap Reductn	0	0	0	0	12	3	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.11	0.64	0.52	0.88	0.27	0.36

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1005: 65th Street & Overland Avenue
2010 Plus Alt#2 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	115	42	87	79
v/c Ratio	0.08	0.22	0.06	0.34
Control Delay	3.8	25.8	2.4	20.6
Queue Delay	0.5	0.0	0.0	0.0
Total Delay	4.3	25.8	2.4	20.6
Queue Length 50th (ft)	4	14	6	22
Queue Length 95th (ft)	m25	39	17	53
Internal Link Dist (ft)	63		854	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1371	236	1553	591
Starvation Cap Reductn	973	0	0	0
Spillback Cap Reductn	0	0	164	24
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.18	0.06	0.14

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1009: Shellmound Way & Christie Ave
2010 Plus Alt#2 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	512	478	164	366	353	501
v/c Ratio	0.14	0.33	0.92	0.87	0.75	0.31	0.48	0.46
Control Delay	35.6	12.5	33.1	28.2	31.7	13.0	2.0	30.1
Queue Delay	0.0	0.3	31.4	17.2	0.0	0.0	1.3	0.1
Total Delay	35.6	12.8	64.4	45.5	31.7	13.0	3.4	30.1
Queue Length 50th (ft)	35	17	389	338	31	95	0	146
Queue Length 95th (ft)	69	72	#567	#508	m144	m48	m6	198
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	444	556	555	219	1199	737	1080
Starvation Cap Reductn	0	0	96	92	0	0	208	0
Spillback Cap Reductn	0	69	108	107	0	0	0	60
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.39	1.05	0.99	0.75	0.31	0.67	0.49

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St
2010 Plus Alt#2 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	309	78	712	955	268	295
v/c Ratio	0.66	0.10	0.83	0.71	0.33	0.27
Control Delay	28.5	1.4	22.4	22.9	24.8	6.4
Queue Delay	0.3	0.0	0.4	2.6	0.0	0.0
Total Delay	28.7	1.4	22.8	25.4	24.8	6.4
Queue Length 50th (ft)	210	6	203	710	118	51
Queue Length 95th (ft)	279	10	m243	m819	237	112
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	980	1186	1347	817	1215
Starvation Cap Reductn	19	0	0	265	0	0
Spillback Cap Reductn	0	0	131	0	0	22
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.08	0.67	0.88	0.33	0.25

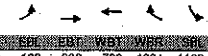
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2010 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	504	490	45	318	1175	147	502
v/c Ratio	0.21	0.16	0.06	0.79	0.77	0.31	0.34	0.74	0.82	0.80
Control Delay	35.8	35.6	20.7	35.7	34.0	35.4	23.8	3.2	32.6	29.4
Queue Delay	0.0	0.0	0.0	3.4	2.6	0.0	0.0	0.0	0.0	1.5
Total Delay	35.8	35.6	20.7	39.1	36.7	35.4	23.8	3.2	32.6	31.0
Queue Length 50th (ft)	13	11	0	250	240	21	64	0	69	219
Queue Length 95th (ft)	39	34	13	#488	#471	54	111	0	126	#417
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	337	354	307	637	636	920	1108	1593	450	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	23	68	68	0	0	0	0	91
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.86	0.86	0.14	0.29	0.74	0.33	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

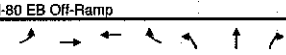
Queues
1012: Powell St & Frontage Rd
2010 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	783	1034	1188	263
v/c Ratio	0.68	0.16	0.59	0.74	0.89	0.35
Control Delay	51.4	14.3	20.9	16.7	34.0	4.9
Queue Delay	0.0	0.0	4.6	0.0	22.7	0.0
Total Delay	51.4	14.3	25.5	16.7	56.7	4.9
Queue Length 50th (ft)	85	55	229	539	396	16
Queue Length 95th (ft)	141	93	m314	712	427	60
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1900	1329	1399	1592	855
Starvation Cap Reductn	0	0	462	0	317	0
Spillback Cap Reductn	0	0	0	0	471	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.16	0.90	0.74	1.06	0.31

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

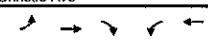
Queues
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1372	1397	437	420	705	683
v/c Ratio	0.73	1.16	0.83	0.64	0.57	0.89	1.75
Control Delay	67.6	97.6	36.4	7.4	27.1	31.8	366.5
Queue Delay	0.0	147.9	1.1	0.2	0.4	1.0	14.3
Total Delay	67.6	245.5	99.6	7.5	27.6	32.8	382.8
Queue Length 50th (ft)	71	~425	334	19	226	323	~754
Queue Length 95th (ft)	m107	#529	#423	m108	336	#616	#1144
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1677	806	734	793	391
Starvation Cap Reductn	0	269	103	50	0	0	0
Spillback Cap Reductn	0	80	112	0	75	16	7
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.48	0.89	0.58	0.64	0.91	1.78

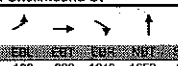
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2010 Plus Alt#2 SAT



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	553	1451	734	360	726	246	153	161	110	547	854
v/c Ratio	0.93	1.31	1.21	1.39	0.68	0.47	0.84	0.86	0.42	1.10	0.66
Control Delay	59.0	170.6	117.2	231.4	37.8	22.0	91.5	93.8	26.5	98.8	10.1
Queue Delay	0.0	13.6	2.8	0.0	0.3	0.0	0.0	0.0	0.0	68.2	2.3
Total Delay	59.0	184.2	119.9	231.4	38.1	22.0	91.5	93.8	26.5	167.0	12.4
Queue Length 50th (ft)	205	~669	~597	~358	237	84	121	127	25	~427	58
Queue Length 95th (ft)	m174	m#503	m#401	#545	304	161	m#235	m#249	m69	m#609	m170
Internal Link Dist (ft)		365			570			520		230	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	524	183	188	261	496	1300
Starvation Cap Reductn	0	25	3	0	0	0	0	0	0	78	305
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	56
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.34	1.22	1.39	0.72	0.47	0.84	0.86	0.42	1.31	0.85

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

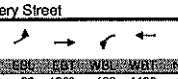


Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1653	348
v/c Ratio	0.21	0.22	0.88	0.89	0.41
Control Delay	23.3	22.9	31.7	18.7	15.1
Queue Delay	1.2	0.7	5.6	0.4	0.0
Total Delay	24.5	23.6	37.3	19.1	15.1
Queue Length 50th (ft)	78	82	436	560	186
Queue Length 95th (ft)	127	114	#540	148	195
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	58	122	0	94	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.48	0.97	0.90	0.41

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

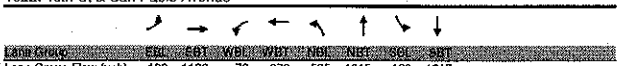
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	979	41	824	254	262	39	250	103
v/c Ratio	0.80	0.85	0.36	0.80	0.69	0.68	0.11	0.66	0.26
Control Delay	80.2	31.0	40.6	38.5	29.1	27.9	21.0	28.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.2	31.0	40.6	38.5	29.1	27.9	21.0	28.0	6.7
Queue Length 50th (ft)	37	204	16	169	90	90	12	89	0
Queue Length 95th (ft)	#120	#348	#46	#299	166	168	35	160	34
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	116	1155	109	923	438	458	436	459	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.85	0.38	0.89	0.58	0.57	0.09	0.54	0.22

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1269	190	1198	226	237	60
v/c Ratio	0.32	0.78	1.19	0.60	0.75	0.52	0.24
Control Delay	62.0	21.8	140.4	15.1	43.0	6.8	27.9
Queue Delay	0.0	41.0	0.0	3.8	0.0	0.1	0.0
Total Delay	62.0	62.8	140.4	19.0	43.0	6.9	27.9
Queue Length 50th (ft)	14	84	~144	63	140	0	28
Queue Length 95th (ft)	m24	#708	m#157	m#451	200	59	55
Internal Link Dist (ft)		1232		264	457		264
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1619	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	701	0	0	0
Spillback Cap Reductn	0	446	0	0	0	30	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.00	1.19	0.92	0.51	0.45	0.14

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1136	78	678	595	1015	160	1217
v/c Ratio	0.81	1.02	0.76	0.81	1.08	0.82	0.78	1.16
Control Delay	62.6	45.6	64.2	44.1	103.7	36.3	57.0	114.3
Queue Delay	0.0	20.9	0.0	4.1	64.5	0.0	0.0	0.5
Total Delay	62.6	66.5	64.2	48.2	168.2	36.3	57.0	114.8
Queue Length 50th (ft)	88	~403	50	212	~220	312	99	~491
Queue Length 95th (ft)	m166	#505	#128	#307	#328	#410	#184	#616
Internal Link Dist (ft)		264		168		434		3676
Turn Bay Length (ft)	165		90		250		195	
Base Capacity (vph)	248	1119	106	835	549	1243	259	1061
Starvation Cap Reductn	0	58	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	94	66	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.08	0.74	0.92	1.24	0.82	0.67	1.16

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #2
2030

Queues
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#2 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1324	124	881	125	349	72	287	214
v/c Ratio	1.08	0.84	0.70	1.05	0.55	0.75	0.24	0.81	0.49
Control Delay	97.5	31.5	50.1	82.9	51.2	49.7	41.7	74.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	31.5	50.1	82.9	51.2	49.7	41.7	74.5	9.3
Queue Length 50th (ft)	~470	416	86	~360	83	117	44	200	0
Queue Length 95th (ft)	#697	#538	m95	m#484	143	167	88	#354	65
Internal Link Dist (ft)		1800		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1562	193	839	257	519	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.84	0.64	1.05	0.49	0.67	0.24	0.89	0.48

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1002: Ashby (SR 13) & San Pablo Avenue

Marketplace Redevelopment
2030 Plus Alt#2 AM

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	884	229	919	125	1097
v/c Ratio	0.84	0.86	0.94	0.91	0.77	0.49	0.92
Control Delay	34.1	12.1	40.4	81.2	38.3	50.4	48.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	12.1	40.4	81.2	38.3	50.4	48.0
Queue Length 50th (ft)	19	66	283	161	315	82	~412
Queue Length 95th (ft)	m28	97	#412	#302	397	143	#560
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	186	1521	1013	257	1192	257	1197
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.62	0.87	0.89	0.77	0.49	0.92

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1004: 65th St & Shellmound St

Marketplace Redevelopment
2030 Plus Alt#2 AM

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	56	69	85	283	200	126	432
v/c Ratio	0.12	0.07	0.12	0.30	0.58	0.29	0.65
Control Delay	11.0	9.5	5.7	0.9	19.5	13.2	13.6
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	11.0	9.5	5.7	1.3	19.5	13.2	13.6
Queue Length 50th (ft)	10	12	8	0	55	29	98
Queue Length 95th (ft)	33	35	22	2	102	51	151
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	463	958	686	959	589	452	988
Starvation Cap Reductn	0	0	0	317	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.12	0.44	0.34	0.28	0.44

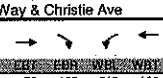
Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	249	53	191	193
v/c Ratio	0.18	0.07	0.14	0.63
Control Delay	3.5	4.0	3.9	22.2
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	3.9	4.0	3.9	22.2
Queue Length 50th (ft)	20	5	16	63
Queue Length 95th (ft)	56	17	46	109
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1379	787	1385	784
Starvation Cap Reductn	698	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.07	0.14	0.25

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	284	123	38	371	24	655
v/c Ratio	0.73	0.41	0.19	0.33	0.14	0.64
Control Delay	27.3	21.9	18.7	8.1	20.9	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.9	18.7	8.1	20.9	14.7
Queue Length 50th (ft)	53	31	11	35	7	81
Queue Length 95th (ft)	#153	70	27	157	23	#336
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	387	299	283	1109	288	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.41	0.13	0.33	0.08	0.64

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	213	199	63	199	255	358
v/c Ratio	0.65	0.59	0.83	0.77	0.09	0.08	0.22	0.16
Control Delay	72.9	20.3	82.0	75.1	0.8	0.5	0.9	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	72.9	20.3	82.0	75.1	0.8	0.5	1.3	6.4
Queue Length 50th (ft)	45	0	150	134	1	1	5	40
Queue Length 95th (ft)	#112	56	#269	#237	m1	1	18	58
Internal Link Dist (ft)	76			335		234		1534
Turn Bay Length (ft)						145		
Base Capacity (vph)	109	211	260	272	670	2368	1143	2214
Starvation Cap Reductn	0	0	0	0	0	0	468	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.79	0.73	0.09	0.08	0.38	0.16

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	SBL	SBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	215	40	300	201	138	162
v/c Ratio	0.73	0.07	0.69	0.14	0.13	0.41
Control Delay	47.7	21.9	37.9	1.1	10.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	21.9	37.8	1.1	10.9	7.8
Queue Length 50th (ft)	137	7	61	0	38	0
Queue Length 95th (ft)	224	m29	139	5	76	52
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	904	1236	1406	1097	460
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.04	0.24	0.14	0.13	0.35

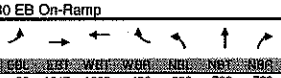
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	411	433	93	111	911	80	349
v/c Ratio	0.03	0.14	0.12	0.61	0.63	0.46	0.11	0.58	0.41	0.70
Control Delay	35.8	36.2	18.2	25.8	26.3	33.5	19.6	1.5	33.1	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.8	26.3	33.5	19.6	1.5	33.1	24.2
Queue Length 50th (ft)	2	9	0	163	173	40	19	0	94	136
Queue Length 95th (ft)	14	35	29	#385	#413	93	41	0	83	246
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	382	402	355	720	729	371	1269	1583	480	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.57	0.59	0.25	0.09	0.58	0.17	0.47

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	780	1103	886	151
v/c Ratio	0.38	0.22	0.59	0.77	0.86	0.26
Control Delay	39.1	5.1	18.7	12.9	34.9	4.5
Queue Delay	0.0	0.0	1.0	0.0	0.1	0.0
Total Delay	39.1	5.1	19.7	12.9	35.0	4.5
Queue Length 50th (ft)	71	31	106	553	272	0
Queue Length 95th (ft)	126	63	m195	m687	314	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2124	1323	1441	1373	724
Starvation Cap Reductn	0	0	285	0	0	0
Spillback Cap Reductn	0	1	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.75	0.77	0.86	0.21

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1047	1203	406	628	733	720
v/c Ratio	0.27	0.44	0.81	0.62	0.98	1.17	1.02
Control Delay	27.2	9.1	18.8	2.6	63.7	117.0	65.4
Queue Delay	0.0	2.2	0.5	0.1	0.0	38.2	50.3
Total Delay	27.2	11.3	19.3	2.7	63.7	155.2	115.7
Queue Length 50th (ft)	21	157	137	6	410	~559	~471
Queue Length 95th (ft)	m48	144	m190	m15	#657	#808	#732
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	783	639	629	707
Starvation Cap Reductn	0	1156	0	43	0	0	0
Spillback Cap Reductn	0	170	64	0	0	44	81
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.85	0.55	0.98	1.25	1.15

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	390	1601	334	75	843	112	22	23	42	204	651
v/c Ratio	0.57	1.14	0.37	0.50	0.89	0.26	0.19	0.19	0.28	0.38	0.43
Control Delay	42.2	90.8	1.6	58.4	47.2	23.3	43.9	44.0	15.4	36.4	4.5
Queue Delay	0.0	11.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Total Delay	42.2	102.4	1.8	58.4	47.2	23.3	43.9	44.0	15.4	37.4	4.5
Queue Length 50th (ft)	117	~656	9	47	271	42	14	14	0	100	24
Queue Length 95th (ft)	m143	m#735	m14	#95	#378	87	38	40	32	m150	81
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	687	1403	897	142	956	447	185	186	212	538	1508
Starvation Cap Reductn	0	32	128	0	0	0	0	0	0	159	27
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	1.17	0.43	0.53	0.88	0.26	0.12	0.12	0.20	0.54	0.44

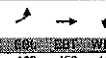
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	520	180
v/c Ratio	0.07	0.07	0.20	0.23	0.17
Control Delay	27.1	26.6	3.1	7.6	12.1
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.1	26.6	3.8	7.6	12.1
Queue Length 50th (ft)	15	14	0	65	53
Queue Length 95th (ft)	38	31	25	88	92
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2277	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.23	0.17

Intersection Summary

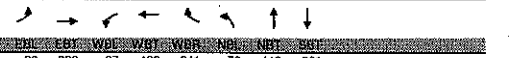
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	814	38	632	312	313	32	306	115
v/c Ratio	1.12	0.57	0.29	0.78	0.86	0.83	0.09	0.86	0.29
Control Delay	122.0	23.4	46.7	43.2	52.0	48.8	24.7	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.0	23.4	46.7	43.2	52.0	48.8	24.7	45.3	10.2
Queue Length 50th (ft)	~365	205	23	196	199	197	12	161	9
Queue Length 95th (ft)	#556	277	55	261	#322	#309	m26	#305	44
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	380	1434	159	810	407	426	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.57	0.24	0.78	0.77	0.73	0.09	0.78	0.27

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	456	111	564	132	809	52	1042
v/c Ratio	0.87	0.87	0.64	0.75	0.65	0.48	0.41	0.67
Control Delay	99.9	34.6	52.0	37.9	46.2	18.8	45.9	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	34.6	52.0	37.9	46.2	18.8	45.9	26.6
Queue Length 50th (ft)	70	126	69	178	82	170	32	264
Queue Length 95th (ft)	#171	168	124	217	136	270	69	#452
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	892	212	1058	301	1756	230	1546
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.51	0.52	0.53	0.44	0.46	0.23	0.67

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	382	87	426	341	78	440	261
v/c Ratio	0.25	0.32	0.56	0.90	0.41	0.17	0.93	0.79
Control Delay	48.4	26.6	58.3	24.5	5.1	29.3	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.6	58.3	24.5	5.5	29.3	56.0	41.8
Queue Length 50th (ft)	16	93	53	90	0	38	265	160
Queue Length 95th (ft)	43	148	#126	175	71	76	#442	222
Internal Link Dist (ft)		240		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1176	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.32	0.56	0.30	0.51	0.16	0.88	0.53

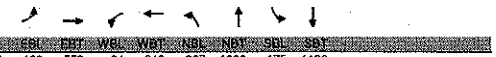
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	441	60	811	219	137	347	42	168	275
v/c Ratio	0.27	0.28	0.44	0.47	0.25	0.67	0.74	0.10	1.18	0.60
Control Delay	46.8	19.9	49.6	21.6	4.1	48.9	36.1	7.4	172.5	32.8
Queue Delay	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	19.9	49.6	23.2	4.5	48.9	36.1	7.4	172.5	32.8
Queue Length 50th (ft)	18	87	37	185	0	85	206	0	#194	125
Queue Length 95th (ft)	46	155	76	302	50	144	266	23	#266	183
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1569	165	1711	879	268	671	597	142	539
Starvation Cap Reductn	0	0	0	676	312	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.36	0.78	0.39	0.62	0.52	0.07	1.18	0.51

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	609	128	913	444	127	58
v/c Ratio	0.04	0.44	0.68	0.49	0.94	0.27	0.39
Control Delay	47.3	24.8	49.7	11.1	60.4	12.3	39.1
Queue Delay	0.0	0.7	0.0	0.6	0.0	0.0	0.0
Total Delay	47.3	25.5	49.7	11.7	60.4	12.3	39.1
Queue Length 50th (ft)	2	146	68	31	274	19	33
Queue Length 95th (ft)	11	234	m107	m282	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1393	208	1857	489	491	295
Starvation Cap Reductn	0	439	0	525	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.64	0.62	0.69	0.91	0.26	0.20

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	558	34	840	367	1020	175	1136
v/c Ratio	0.63	0.56	0.19	0.85	0.76	0.79	0.78	0.82
Control Delay	68.9	41.3	46.3	45.3	52.8	34.9	49.7	44.4
Queue Delay	0.0	0.0	0.0	0.1	2.2	0.0	0.0	0.1
Total Delay	68.9	41.3	46.3	45.4	55.1	34.9	49.7	44.4
Queue Length 50th (ft)	71	126	17	208	117	303	109	360
Queue Length 95th (ft)	126	234	m51	#421	#178	#447	174	#494
Internal Link Dist (ft)		271		419		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1167	194	974	481	1286	301	1293
Starvation Cap Reductn	0	12	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	4	40	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.49	0.18	0.87	0.83	0.79	0.58	0.92

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	506	117	828	240	409
v/c Ratio	0.31	0.28	0.59	0.41	0.40	0.75
Control Delay	17.8	9.7	32.8	7.7	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	9.7	32.8	7.7	16.0	26.3
Queue Length 50th (ft)	19	79	33	42	25	52
Queue Length 95th (ft)	m39	m116	#86	126	51	#107
Internal Link Dist (ft)		418		1192	922	269
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	246	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.28	0.55	0.41	0.39	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	447	63	183	5	298
v/c Ratio	0.63	0.06	0.44	0.01	0.52
Control Delay	9.9	4.3	10.2	11.0	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	4.3	10.2	11.0	5.5
Queue Length 50th (ft)	37	4	18	1	10
Queue Length 95th (ft)	#120	19	64	6	58
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	727	1192	647	736	844
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.05	0.28	0.01	0.35

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	79	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	565	570	617	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1355	1293
v/c Ratio	0.83	0.77	0.66	0.63
Control Delay	60.2	47.9	17.1	16.4
Queue Delay	0.0	0.0	0.8	0.0
Total Delay	60.2	47.9	17.7	16.4
Queue Length 50th (ft)	101	147	315	291
Queue Length 95th (ft)	#170	202	398	369
Internal Link Dist (ft)	2	922	3	796
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	321	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.76	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	670	1244
v/c Ratio	0.58	1.17	0.37	0.45
Control Delay	27.5	115.9	13.5	14.0
Queue Delay	0.1	0.0	3.3	0.0
Total Delay	27.6	115.9	16.8	14.1
Queue Length 50th (ft)	201	~560	120	169
Queue Length 95th (ft)	262	#797	159	197
Internal Link Dist (ft)	983		192	396
Turn Bay Length (ft)		70		
Base Capacity (vph)	1304	730	1789	2792
Starvation Cap Reductn	0	0	994	0
Spillback Cap Reductn	98	0	0	204
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.17	0.84	0.48

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1028: 35th St & San Pablo Avenue

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	708	560	705
v/c Ratio	0.71	0.47	0.88	0.29
Control Delay	25.2	15.7	45.2	5.4
Queue Delay	0.0	0.0	0.0	0.7
Total Delay	25.2	15.8	45.2	6.1
Queue Length 50th (ft)	108	106	122	53
Queue Length 95th (ft)	146	170	#206	94
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	638	2392
Starvation Cap Reductn	0	0	0	1252
Spillback Cap Reductn	47	76	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.49	0.88	0.62

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1001: Ashby (SR 13) & Seventh St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1054	156	1031	216	682	159	999	533
v/c Ratio	0.92	0.85	0.78	1.05	0.67	1.06	0.45	1.07	0.88
Control Delay	71.3	39.8	57.3	61.9	51.1	89.7	43.4	109.1	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	39.8	57.3	61.9	51.1	89.7	43.4	109.1	30.0
Queue Length 50th (ft)	219	356	108	428	152	471	99	~313	120
Queue Length 95th (ft)	#380	#458	m98	m341	m195	m#365	166	#503	#324
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	646	354	373	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.67	1.06	0.45	1.07	0.88

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1002: Ashby (SR 13) & San Pablo Avenue

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	987	294	1443	201	1366
v/c Ratio	1.61	0.67	1.05	1.07	1.29	0.83	1.32
Control Delay	324.4	26.5	74.7	120.0	170.9	74.7	182.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	324.4	26.5	74.7	120.0	170.9	74.7	182.9
Queue Length 50th (ft)	~220	344	~306	~232	~687	140	~666
Queue Length 95th (ft)	m#285	m399	#529	#402	#827	#266	#805
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	132	1518	938	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.61	0.67	1.05	1.07	1.29	0.83	1.32

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1004: 65th St & Shellmound St

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	105	89	162	639	707	98	477
v/c Ratio	0.78	0.13	0.34	0.77	0.98	0.56	0.52
Control Delay	63.0	13.5	15.1	13.9	50.0	11.0	11.0
Queue Delay	0.0	0.0	1.0	2.9	0.6	0.6	0.0
Total Delay	63.0	13.5	16.1	16.7	50.6	11.6	11.0
Queue Length 50th (ft)	34	20	33	27	226	16	91
Queue Length 95th (ft)	#117	47	74	#258	#445	36	159
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	134	686	482	834	719	276	959
Starvation Cap Reductn	0	0	151	107	0	0	0
Spillback Cap Reductn	0	0	0	0	2	43	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.13	0.49	0.88	0.99	0.42	0.50

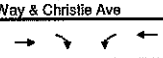
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	429	39	394	453
v/c Ratio	0.42	0.10	0.38	0.82
Control Delay	8.5	9.6	10.4	20.4
Queue Delay	1.3	0.0	0.0	0.2
Total Delay	9.8	9.6	10.4	20.6
Queue Length 50th (ft)	59	8	71	146
Queue Length 95th (ft)	m80	25	166	195
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1031	373	1036	821
Starvation Cap Reductn	393	0	0	0
Spillback Cap Reductn	0	0	32	47
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.10	0.39	0.59

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

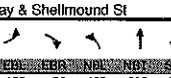
Lane Group	EBT	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	493	175	172	795	20	616
v/c Ratio	1.14	0.38	0.76	0.82	0.12	0.92
Control Delay	110.4	17.2	44.8	22.9	22.6	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.4	17.2	44.8	22.9	22.6	35.3
Queue Length 50th (ft)	#193	41	56	229	8	166
Queue Length 95th (ft)	#353	86	m#128	#523	m14	m#245
Internal Link Dist (ft)	863	1768		875		514
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	433	466	225	972	225	672
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.38	0.76	0.82	0.09	0.92

Intersection Summary
Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



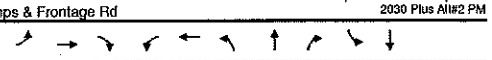
Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	456	432	137	355	169	509
v/c Ratio	0.17	0.54	0.80	0.58	0.51	0.26	0.26	0.41
Control Delay	50.6	16.8	10.3	9.3	31.1	20.7	5.5	25.0
Queue Delay	0.0	0.2	1.3	1.1	0.0	0.0	0.3	0.0
Total Delay	50.6	17.1	11.7	10.4	31.1	20.7	5.8	25.0
Queue Length 50th (ft)	12	0	102	86	38	51	14	131
Queue Length 95th (ft)	35	52	162	144	m74	m82	m38	177
Internal Link Dist (ft)	128			395		234		1534
Turn Bay Length (ft)						145		
Base Capacity (vph)	144	219	755	749	270	1358	661	1242
Starvation Cap Reductn	0	0	93	92	0	0	183	0
Spillback Cap Reductn	0	8	136	134	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47	0.74	0.70	0.51	0.26	0.35	0.41

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



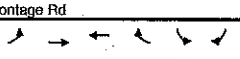
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	155	36	499	686	293	389
v/c Ratio	0.53	0.05	0.85	0.48	0.30	0.90
Control Delay	26.8	1.0	37.4	2.3	20.5	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	1.0	37.4	2.3	20.5	26.2
Queue Length 50th (ft)	54	0	105	6	117	133
Queue Length 95th (ft)	101	4	128	17	228	227
Internal Link Dist (ft)	935			793	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	866	1155	1422	936	571
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.04	0.43	0.48	0.30	0.68

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	298	312	12	759	1480	283	668
v/c Ratio	0.59	1.20	0.22	0.80	0.83	0.13	0.90	0.93	0.85	0.81
Control Delay	46.2	152.3	28.4	42.4	43.7	47.4	46.6	13.4	48.8	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	152.3	28.4	42.4	43.7	47.4	46.6	13.4	48.8	32.5
Queue Length 50th (ft)	105	~307	22	178	189	7	240	0	165	321
Queue Length 95th (ft)	#193	#506	62	282	#315	26	#369	#122	#294	#653
Internal Link Dist (ft)		785			23		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	308	324	282	440	446	242	879	1593	386	826
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.20	0.22	0.67	0.70	0.05	0.86	0.93	0.73	0.81

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1347	1247	960	361
v/c Ratio	0.46	0.49	0.99c(	0.89	0.91	0.52
Control Delay	45.6	5.8	21.3	19.4	45.0	8.1
Queue Delay	0.0	0.0	184.0	0.0	1.3	0.0
Total Delay	45.6	5.8	205.2	19.4	46.3	8.1
Queue Length 50th (ft)	95	87	~452	714	324	27
Queue Length 95th (ft)	160	134	m388	m634	#410	105
Internal Link Dist (ft)		618	296			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2219	1369	1390	1124	723
Starvation Cap Reductn	0	0	441	0	0	0
Spillback Cap Reductn	0	9	0	0	84	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.49	1.43	0.89	0.90	0.50

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1187	1861	464	603	800	574
v/c Ratio	0.45	0.80	1.10	0.60	1.07	1.35	1.65
Control Delay	64.4	14.2	83.4	6.8	93.2	196.4	330.5
Queue Delay	0.0	9.4	157.5	0.4	20.9	37.9	83.4
Total Delay	64.4	23.6	240.9	7.1	123.1	234.3	413.9
Queue Length 50th (ft)	111	84	~584	42	~496	~752	~996
Queue Length 95th (ft)	m145	102	m#532	m36	#726	#1015	#961
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	592	347
Starvation Cap Reductn	0	182	108	58	0	0	0
Spillback Cap Reductn	0	282	410	0	37	35	35
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.99	1.46	0.65	1.14	1.44	1.84

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	399	1191	745	325	1274	241	72	76	66	419	812
v/c Ratio	0.75	1.17	1.05	1.19	1.20	0.48	0.34	0.95	0.25	0.85	0.67
Control Delay	55.2	113.8	48.5	151.6	134.1	33.4	49.6	49.9	25.2	48.7	10.4
Queue Delay	0.0	24.4	5.6	0.0	209.4	0.0	0.0	0.0	0.0	31.5	0.2
Total Delay	55.2	138.2	54.0	151.6	343.5	33.4	49.6	49.9	25.2	80.2	10.6
Queue Length 50th (ft)	149	~543	268	~272	~564	140	57	61	19	201	159
Queue Length 95th (ft)	m144	m#463	m410	#469	#733	233	110	113	65	#445	128
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200			30	180			
Base Capacity (vph)	691	1017	708	274	1062	501	214	217	259	493	1218
Starvation Cap Reductn	0	46	10	0	0	0	0	0	0	92	48
Spillback Cap Reductn	0	0	0	0	298	0	0	0	0	0	46
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	1.23	1.07	1.19	1.67	0.48	0.34	0.95	0.25	1.04	0.70

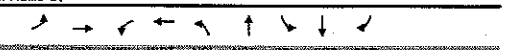
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1015: Christie Ave & Shellmound St

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1201	313
v/c Ratio	0.17	0.17	0.44	0.58	0.51
Control Delay	32.3	31.0	8.3	15.6	42.4
Queue Delay	2.3	1.0	0.6	0.0	0.0
Total Delay	34.6	32.3	8.8	15.6	42.4
Queue Length 50th (ft)	62	65	81	262	228
Queue Length 95th (ft)	118	104	138	324	323
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1868	2069	810
Starvation Cap Reductn	351	750	576	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.64	0.58	0.51

Intersection Summary

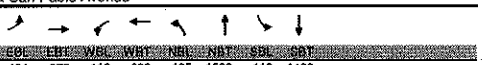
1016: Powell St & Hollis St



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1196	24	845	563	661	73	314	158
v/c Ratio	1.35	1.23	0.26	1.15	0.90	1.01	0.20	0.83	0.36
Control Delay	232.1	144.5	56.4	123.4	55.7	75.8	43.4	53.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	10.0	35.6	0.0	0.0	0.0
Total Delay	232.1	144.5	56.4	123.4	65.7	114.3	43.4	53.4	14.2
Queue Length 50th (ft)	~207	~564	17	~370	395	~509	49	216	16
Queue Length 95th (ft)	m#354	m#697	45	#498	#678	#818	m88	301	79
Internal Link Dist (ft)		159		1493		357		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	976	97	733	624	653	499	525	546
Starvation Cap Reductn	0	0	0	0	51	62	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.23	0.25	1.15	0.98	1.12	0.15	0.60	0.29

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1017: Stanford Ave & San Pablo Avenue



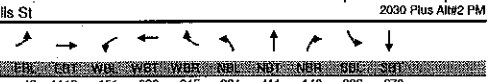
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	975	112	608	195	1592	118	1460
v/c Ratio	0.97	0.97	0.85	0.69	0.82	1.26	0.67	1.28
Control Delay	99.3	53.1	50.5	32.3	58.0	151.5	52.2	161.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	53.1	50.5	32.3	58.0	151.5	52.2	161.9
Queue Length 50th (ft)	116	282	61	154	108	~649	65	~601
Queue Length 95th (ft)	#243	#423	#118	212	#213	#786	#131	#737
Internal Link Dist (ft)		207		2595		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1010	197	976	258	1265	197	1141
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.97	0.57	0.62	0.76	1.26	0.60	1.28

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1018: 40th St & Horton St

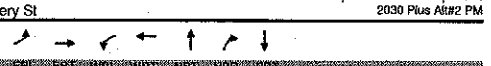
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	959	166	795	113	245	640	711
v/c Ratio	0.31	1.19	1.34	0.82	0.23	0.51	1.10	1.45
Control Delay	50.1	130.1	234.7	43.4	7.4	35.4	106.5	241.8
Queue Delay	0.0	67.3	19.4	2.3	0.0	0.0	0.0	1.3
Total Delay	50.1	197.4	254.1	45.7	7.4	35.4	106.5	243.1
Queue Length 50th (ft)	21	~381	~199	263	0	192	~383	~826
Queue Length 95th (ft)	51	#510	#270	#392	43	210	#590	#852
Internal Link Dist (ft)		246		256			993	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	809	124	979	500	478	489	492
Starvation Cap Reductn	0	92	0	85	0	0	0	0
Spillback Cap Reductn	0	14	4	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.34	1.38	0.89	0.23	0.51	1.10	1.45

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



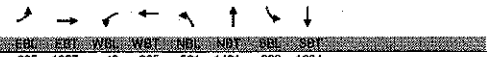
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1113	151	836	245	224	411	140	332	670
v/c Ratio	0.39	1.01	0.74	0.60	0.39	1.06	0.76	0.26	1.57	1.25
Control Delay	46.8	64.6	56.8	27.4	4.5	121.4	43.0	6.0	297.9	152.8
Queue Delay	0.0	95.9	0.0	5.4	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	160.4	56.8	32.7	5.0	121.4	43.0	6.0	297.3	152.8
Queue Length 50th (ft)	30	~410	99	232	0	~157	238	0	~306	~542
Queue Length 95th (ft)	64	#542	#173	314	52	#305	#362	44	m#369	m#598
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1102	280	1400	738	212	540	540	212	535
Starvation Cap Reductn	0	208	0	492	190	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.24	0.66	0.92	0.45	1.06	0.76	0.26	1.57	1.25

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1483	166	1141	535	302	209
v/c Ratio	0.19	1.34	0.78	0.87	1.18	0.59	0.76
Control Delay	40.1	189.3	50.3	24.5	136.2	19.4	46.7
Queue Delay	0.0	130.7	0.0	7.2	0.0	4.0	4.9
Total Delay	40.1	318.9	50.3	31.7	136.2	23.4	51.6
Queue Length 50th (ft)	19	~644	95	~408	~411	71	126
Queue Length 95th (ft)	48	#903	m53	m#281	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1108	301	1305	454	515	348
Starvation Cap Reductn	0	198	0	137	0	0	0
Spillback Cap Reductn	0	80	0	0	0	130	84
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.53	0.55	0.99	1.18	0.80	0.79

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1357	49	825	561	1451	298	1634
v/c Ratio	0.96	1.33	0.61	1.22	1.26	1.09	1.20	1.23
Control Delay	98.3	178.1	57.1	146.2	170.6	86.3	159.0	138.0
Queue Delay	2.1	22.4	0.0	6.5	0.0	1.8	0.0	21.3
Total Delay	40.5	200.6	57.1	152.6	170.6	88.1	159.0	159.3
Queue Length 50th (ft)	122	~570	32	~335	~232	~547	~232	~682
Queue Length 95th (ft)	m77	m#394	m67	m#434	#339	#685	#396	#823
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1019	106	674	446	1307	249	1333
Starvation Cap Reductn	0	37	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.38	0.46	1.24	1.26	1.10	1.20	1.27

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1062	47	804	440	485
v/c Ratio	0.25	0.53	0.28	0.41	0.66	0.86
Control Delay	20.6	11.5	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	11.5	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	164	13	49	50	52
Queue Length 95th (ft)	m17	m153	36	128	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1987	249	1957	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.53	0.19	0.41	0.64	0.83

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1024: Mandela Pkwy & Horton St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	563	112	349	160	780
v/c Ratio	1.10	0.13	1.09	0.21	1.02
Control Delay	90.7	13.6	110.1	12.2	57.7
Queue Delay	0.0	0.0	0.0	0.0	15.2
Total Delay	90.7	13.6	110.1	12.2	72.9
Queue Length 50th (ft)	291	33	~209	40	~386
Queue Length 95th (ft)	#494	64	#380	79	#642
Internal Link Dist (ft)		1606	582	425	393
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	751	768
Starvation Cap Reductn	0	0	0	0	33
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.10	0.13	1.09	0.21	1.06

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1025: W. MacArthur Blvd & Emery St

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	588	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1026: Adeline St & San Pablo Avenue

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1794	2022
v/c Ratio	1.11	0.74	0.91	1.02
Control Delay	117.3	47.0	29.2	50.8
Queue Delay	0.0	0.0	16.1	0.0
Total Delay	117.3	47.0	45.3	50.8
Queue Length 50th (ft)	~206	130	545	~774
Queue Length 95th (ft)	#315	180	#757	#930
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1970	1974
Starvation Cap Reductn	0	0	225	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.02	1.02

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1027: 36th St & San Pablo Avenue

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1212	1947
v/c Ratio	0.62	1.58	0.78	0.83
Control Delay	30.2	292.8	17.5	12.2
Queue Delay	1.0	0.0	62.1	2.3
Total Delay	31.3	292.8	79.6	14.5
Queue Length 50th (ft)	168	~860	245	232
Queue Length 95th (ft)	227	#989	338	278
Internal Link Dist (ft)	983		192	396
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	536	1555	3103
Starvation Cap Reductn	0	0	484	0
Spillback Cap Reductn	186	0	0	978
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	1.58	1.13	0.92

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	1017	1207	976	1055
v/c Ratio	1.14	0.97	1.01	0.44
Control Delay	113.0	54.1	71.1	9.1
Queue Delay	82.7	156.6	248.3	11.3
Total Delay	195.7	209.7	319.4	20.4
Queue Length 50th (ft)	~441	~434	~360	164
Queue Length 95th (ft)	#573	#586	#500	205
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1307
Spillback Cap Reductn	127	359	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.32	1.35	1.69	0.98

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	82	64	147	351	710	98	627
v/c Ratio	0.41	0.10	0.93	0.48	0.91	0.29	0.84
Control Delay	27.1	14.4	13.6	3.6	25.4	7.5	11.2
Queue Delay	0.0	0.0	1.0	0.3	0.0	0.0	0.0
Total Delay	27.1	14.4	14.5	3.9	25.4	7.5	11.2
Queue Length 50th (ft)	28	14	25	0	194	13	114
Queue Length 95th (ft)	#76	39	54	0	#394	29	193
Internal Link Dist (ft)		493		63	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	202	615	447	736	850	339	1104
Starvation Cap Reductn	0	0	136	84	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.10	0.47	0.54	0.84	0.29	0.57

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	122	47	87	262
v/c Ratio	0.12	0.23	0.07	0.66
Control Delay	4.7	25.2	5.3	22.4
Queue Delay	1.3	0.0	0.0	0.0
Total Delay	6.0	25.2	5.3	22.4
Queue Length 50th (ft)	0	16	10	85
Queue Length 95th (ft)	m19	41	30	133
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1022	266	1199	592
Starvation Cap Reductn	737	0	0	0
Spillback Cap Reductn	0	0	13	10
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.18	0.07	0.45

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	538	502	155	313	322	511
v/c Ratio	0.14	0.34	0.94	0.89	0.75	0.27	0.46	0.48
Control Delay	35.6	13.5	37.6	31.3	40.5	16.6	2.5	30.9
Queue Delay	0.0	0.4	54.2	33.6	0.0	0.0	1.0	0.1
Total Delay	35.6	13.8	91.8	64.9	40.5	16.6	3.5	30.9
Queue Length 50th (ft)	35	21	~386	~354	~98	~98	1	149
Queue Length 95th (ft)	69	76	#610	#551	m#184	m61	m16	202
Internal Link Dist (ft)	195			342		235		1656
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	439	596	568	207	1161	705	1060
Starvation Cap Reductn	0	0	97	92	0	0	186	0
Spillback Cap Reductn	0	70	114	112	0	0	0	58
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.40	1.12	1.05	0.75	0.27	0.62	0.51

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St
2030 Plus Alt#2 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	283	73	751	929	386	305
v/c Ratio	0.80	0.09	0.84	0.69	0.48	0.28
Control Delay	32.3	1.5	22.1	21.1	27.5	7.1
Queue Delay	0.1	0.0	0.4	1.8	0.0	0.0
Total Delay	32.4	1.5	22.5	23.0	27.5	7.1
Queue Length 50th (ft)	184	7	213	680	197	61
Queue Length 95th (ft)	255	11	m243	m778	350	127
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	945	1186	1356	806	1203
Starvation Cap Reductn	11	0	0	264	0	0
Spillback Cap Reductn	0	0	124	0	0	7
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.08	0.71	0.85	0.48	0.26

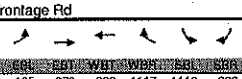
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	452	440	45	357	1196	147	544
v/c Ratio	0.22	0.17	0.07	0.76	0.74	0.32	0.34	0.76	0.63	0.79
Control Delay	35.9	35.6	20.7	34.1	32.7	35.7	23.5	3.4	33.3	31.7
Queue Delay	0.0	0.0	0.0	2.4	1.9	0.0	0.0	0.0	0.0	1.6
Total Delay	35.9	35.6	20.7	36.5	34.6	35.7	23.5	3.4	33.3	33.2
Queue Length 50th (ft)	13	11	0	215	206	21	73	0	69	246
Queue Length 95th (ft)	39	34	13	#421	#405	54	124	0	126	#470
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210			55		175			135	
Base Capacity (vph)	322	339	294	595	596	306	1196	1583	491	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	17	61	61	0	0	0	0	65
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.85	0.82	0.15	0.31	0.76	0.34	0.83

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

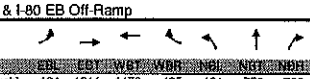
Queues
1012: Powell St & Frontage Rd
2030 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	820	1117	1110	282
v/c Ratio	0.68	0.19	0.60	0.80	0.80	0.36
Control Delay	51.4	13.0	19.5	19.6	34.4	4.3
Queue Delay	0.0	0.0	8.0	0.0	103.7	0.0
Total Delay	51.4	13.0	27.6	19.6	138.0	4.3
Queue Length 50th (ft)	87	61	248	608	373	10
Queue Length 95th (ft)	143	106	m312	m763	397	57
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1953	1376	1399	1592	873
Starvation Cap Reductn	0	0	513	0	283	0
Spillback Cap Reductn	0	2	0	0	686	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.19	0.95	0.80	1.23	0.32

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1311	1473	495	464	756	733
v/c Ratio	0.72	1.10	0.89	0.59	0.63	0.95	1.87
Control Delay	69.1	78.1	42.3	7.8	28.9	41.7	424.5
Queue Delay	0.0	200.0	10.5	0.2	0.4	54.7	267.1
Total Delay	69.1	278.0	52.8	8.0	29.3	96.5	691.6
Queue Length 50th (ft)	76	~365	374	31	262	392	~881
Queue Length 95th (ft)	m129	#487	#508	m120	382	#704	#1277
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	200	1197	1654	838	734	794	391
Starvation Cap Reductn	0	267	92	50	0	0	0
Spillback Cap Reductn	0	349	162	0	47	124	94
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.55	1.00	0.63	0.68	1.13	2.47

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	420	1538	827	380	816	247	153	161	110	556	898
v/c Ratio	0.71	1.46	1.36	1.39	0.77	0.48	0.84	0.86	0.42	1.12	0.69
Control Delay	53.4	235.0	186.0	231.4	40.8	23.6	91.5	93.8	26.5	104.1	11.0
Queue Delay	0.0	19.1	2.0	0.0	0.5	0.0	0.0	0.0	0.0	91.9	3.6
Total Delay	53.4	254.0	188.1	231.4	41.3	23.6	91.5	93.8	26.5	196.0	14.6
Queue Length 50th (ft)	152	~791	~777	~358	275	91	121	127	25	~439	69
Queue Length 95th (ft)	m128	m#603	m#538	#545	350	169	m#235	m#249	m69	m#592	m193
Internal Link Dist (ft)		966			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	606	274	1062	517	183	186	261	496	1289
Starvation Cap Reductn	0	39	2	0	0	0	0	0	0	79	238
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	134
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.50	1.37	1.39	0.81	0.48	0.84	0.86	0.42	1.33	0.90

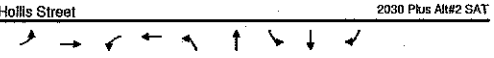
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1682	451
v/c Ratio	0.22	0.22	0.83	0.90	0.53
Control Delay	23.5	23.1	28.4	19.5	17.1
Queue Delay	1.2	0.7	2.2	0.5	0.0
Total Delay	24.6	23.7	30.6	20.0	17.1
Queue Length 50th (ft)	79	82	312	566	275
Queue Length 95th (ft)	127	114	370	148	212
Internal Link Dist (ft)		150		620	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	856
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	54	112	0	28	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.92	0.53

Intersection Summary

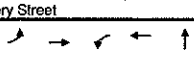
Queues
1016: Powell St & Hollis Street
2030 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1112	43	840	305	337	40	308	107
v/c Ratio	1.00	1.01	0.41	0.96	0.77	0.81	0.10	0.76	0.25
Control Delay	126.5	57.5	43.3	49.3	35.2	36.5	21.2	33.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.5	57.5	43.3	49.3	35.2	36.5	21.2	33.4	6.7
Queue Length 50th (ft)	~52	~294	19	~187	118	130	19	118	0
Queue Length 95th (ft)	#142	#413	#51	#307	#227	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	110	1098	104	876	426	449	425	448	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.01	0.41	0.96	0.71	0.75	0.09	0.69	0.24

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street
2030 Plus Alt#2 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT
Lane Group Flow (vph)	21	1566	190	1447	469	238	79
v/c Ratio	0.34	1.17	1.19	0.84	1.06	0.48	0.31
Control Delay	58.4	111.3	129.3	21.9	97.0	16.0	30.5
Queue Delay	0.0	148.2	0.0	90.9	0.0	0.1	0.0
Total Delay	58.4	259.6	129.3	120.8	97.0	16.1	30.5
Queue Length 50th (ft)	11	~587	~144	333	~330	45	42
Queue Length 95th (ft)	m27	#922	m#117	m#491	#525	117	72
Internal Link Dist (ft)		1232		264	457		264
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	525	0	0	0
Spillback Cap Reductn	0	294	0	0	0	12	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.51	1.19	1.22	1.06	0.49	0.18

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue — 2030 Plus Alt#2 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1342	78	836	663	1232	170	1504
v/c Ratio	0.90	1.22	0.76	1.02	1.21	1.00	0.80	1.43
Control Delay	60.8	113.6	84.2	74.9	147.2	59.5	59.7	226.9
Queue Delay	0.0	35.5	0.0	52.8	347.6	0.0	0.0	1.2
Total Delay	60.8	149.1	84.2	127.7	494.9	59.5	59.7	228.1
Queue Length 50th (ft)	114	~539	50	~393	~267	~451	105	~687
Queue Length 95th (ft)	m138	m#426	#128	#427	#378	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1104	105	819	549	1232	239	1054
Starvation Cap Reductn	0	66	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	96	215	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.30	0.74	1.16	1.69	1.00	0.71	1.43

Intersection Summary
~: Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
#: 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m: Volume for 95th percentile queue is metered by upstream signal.

5:00 pm Baseline
Fehr & Peers Associates, Inc.
Synchro 6 Report
Page 12

SYNCHRO QUEUE SHEETS
ALTERNATIVE #3
BASE YEAR

Queues
1001: Ashby (SR 13) & Seventh St — Marketplace Redevelopment, Existing Plus Alt#3 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1174	111	692	95	236	64	199	202
v/c Ratio	0.97	0.67	0.64	0.68	0.51	0.62	0.25	0.74	0.50
Control Delay	68.2	22.7	46.7	54.0	50.1	44.9	42.2	53.3	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	22.7	46.7	54.0	50.1	44.9	42.2	53.3	9.2
Queue Length 50th (ft)	375	306	77	271	65	76	40	135	0
Queue Length 95th (ft)	#596	433	m130	#353	115	114	79	210	63
Internal Link Dist (ft)		1600		1209		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1752	193	1024	257	520	308	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.67	0.58	0.68	0.37	0.45	0.21	0.62	0.46

Intersection Summary
#: 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m: Volume for 95th percentile queue is metered by upstream signal.

1/29/2007
Fehr & Peers Associates, Inc.
Synchro 6 Report
Page 1

Queues
1002: Ashby (SR 13) & San Pablo Avenue — Marketplace Redevelopment, Existing Plus Alt#3 AM

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	860	736	141	603	123	793
v/c Ratio	0.47	0.77	0.88	0.67	0.40	0.48	0.50
Control Delay	17.6	19.0	36.4	54.1	24.0	50.1	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	19.0	36.4	54.1	24.0	50.1	24.4
Queue Length 50th (ft)	17	152	252	96	148	81	200
Queue Length 95th (ft)	m20	85	288	160	231	141	314
Internal Link Dist (ft)		1299	1605		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	219	1522	1131	257	1489	257	1571
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.57	0.85	0.55	0.40	0.48	0.50

Intersection Summary
m: Volume for 95th percentile queue is metered by upstream signal.

1/29/2007
Fehr & Peers Associates, Inc.
Synchro 6 Report
Page 2

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	103	39	309	25	472
v/c Ratio	0.72	0.36	0.20	0.28	0.14	0.46
Control Delay	25.7	20.9	18.7	8.0	21.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	20.9	18.7	8.0	21.0	10.0
Queue Length 50th (ft)	51	25	11	28	7	51
Queue Length 95th (ft)	#148	61	31	131	24	177
Internal Link Dist (ft)	668	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	392	285	283	1109	283	1022
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.36	0.14	0.28	0.09	0.46

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	348	366	166	422
v/c Ratio	0.22	0.22	0.20	0.28
Control Delay	7.1	3.2	1.7	17.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.1	3.2	1.7	17.3
Queue Length 50th (ft)	21	4	0	84
Queue Length 95th (ft)	38	3	m0	118
Internal Link Dist (ft)	335	234		1634
Turn Bay Length (ft)			145	
Base Capacity (vph)	1577	1628	818	1518
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.22	0.20	0.28

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	120	16	242	195	97	158
v/c Ratio	0.58	0.03	0.52	0.13	0.08	0.49
Control Delay	44.3	28.6	40.6	0.4	9.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	28.6	40.6	0.4	9.9	8.6
Queue Length 50th (ft)	82	2	58	3	21	0
Queue Length 95th (ft)	142	23	45	4	57	55
Internal Link Dist (ft)	935			733	1707	
Turn Bay Length (ft)	230		145			80
Base Capacity (vph)	972	826	1296	1498	1169	457
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.02	0.20	0.13	0.08	0.35

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	347	366	96	45	767	65	322
v/c Ratio	0.03	0.12	0.10	0.62	0.86	0.42	0.04	0.48	0.31	0.60
Control Delay	35.4	35.5	18.2	23.5	23.9	31.9	18.5	1.1	32.4	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	35.5	18.2	23.5	23.9	31.9	18.5	1.1	32.4	21.7
Queue Length 50th (ft)	2	9	0	123	130	36	6	0	24	108
Queue Length 95th (ft)	14	36	20	#286	#322	95	20	0	71	224
Internal Link Dist (ft)		789			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	440	463	406	739	749	428	1486	1589	541	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.04	0.47	0.49	0.22	0.03	0.48	0.12	0.39

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT
Lane Group Flow (vph)	129	441	739	899	734	139
v/c Ratio	0.38	0.19	0.50	0.62	0.84	0.28
Control Delay	39.3	4.0	17.6	7.1	36.5	5.2
Queue Delay	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	39.3	4.0	18.1	7.1	36.5	5.2
Queue Length 50th (ft)	72	25	108	260	230	0
Queue Length 95th (ft)	129	53	m147	m378	271	42
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2263	1481	1441	1371	717
Starvation Cap Reductn	0	0	325	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.64	0.62	0.53	0.19

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	869	998	326	533	636	624
v/c Ratio	0.25	0.37	0.67	0.45	0.84	0.97	0.86
Control Delay	21.0	9.6	20.3	3.0	41.5	53.4	36.1
Queue Delay	0.0	1.4	0.1	0.0	0.0	0.8	0.1
Total Delay	21.0	11.0	20.4	3.0	41.5	54.1	36.2
Queue Length 50th (ft)	14	149	121	3	318	351	322
Queue Length 95th (ft)	m43	138	151	18	#513	#620	#557
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	321	2360	1484	726	639	655	715
Starvation Cap Reductn	0	1227	0	0	0	0	0
Spillback Cap Reductn	0	98	29	0	0	3	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.69	0.45	0.83	0.98	0.87

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	492	1201	347	49	647	103	24	25	46	156	646
v/c Ratio	0.71	0.86	0.39	0.38	0.68	0.23	0.21	0.22	0.30	0.29	0.43
Control Delay	48.4	21.7	1.5	38.9	26.1	13.5	44.7	44.8	15.4	33.6	9.7
Queue Delay	0.0	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	23.4	1.6	38.9	26.1	13.5	44.7	44.8	15.4	33.6	9.7
Queue Length 50th (ft)	184	263	6	20	111	19	15	15	0	89	65
Queue Length 95th (ft)	m200	m#518	m13	m47	142	m41	42	43	34	145	108
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	692	1408	914	142	956	452	185	186	215	540	1518
Starvation Cap Reductn	0	92	123	0	0	0	0	0	0	0	78
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.91	0.44	0.35	0.68	0.23	0.13	0.13	0.21	0.29	0.45

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	406	118
v/c Ratio	0.03	0.03	0.14	0.03	0.22	0.26	0.18
Control Delay	19.4	19.0	2.4	45.0	19.4	18.1	34.8
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.1	34.8
Queue Length 50th (ft)	6	9	0	4	0	83	74
Queue Length 95th (ft)	26	22	21	19	24	116	125
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1563	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.02	0.03	0.11	0.26	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	634	37	492	248	216	28	153	101
v/c Ratio	0.73	0.37	0.28	0.61	0.78	0.65	0.12	0.83	0.34
Control Delay	28.9	10.7	46.6	37.0	44.2	39.4	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	10.7	46.6	37.0	44.2	39.4	31.3	38.9	9.9
Queue Length 50th (ft)	233	114	22	143	155	127	16	95	0
Queue Length 95th (ft)	m#432	m225	54	198	235	200	29	100	39
Internal Link Dist (ft)		159		1493		967		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	532	1724	159	810	409	428	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.37	0.23	0.61	0.61	0.50	0.08	0.39	0.25

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	294	97	427	112	548	53	702
v/c Ratio	0.63	0.53	0.59	0.71	0.61	0.28	0.41	0.39
Control Delay	65.8	29.6	50.0	39.4	45.6	13.4	45.9	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	29.6	50.0	39.4	45.6	13.4	45.9	16.9
Queue Length 50th (ft)	47	66	60	134	69	94	33	140
Queue Length 95th (ft)	#108	107	111	177	120	152	70	222
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	902	212	1059	301	1977	230	1817
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.46	0.40	0.37	0.28	0.23	0.39

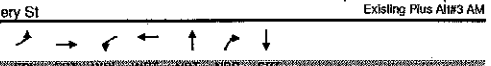
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	246	47	327	66	67	91	38
v/c Ratio	0.26	0.12	0.38	0.15	0.07	0.38	0.48	0.16
Control Delay	48.0	10.8	50.1	11.3	4.6	43.1	31.3	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	10.8	50.1	11.3	4.6	43.1	31.3	28.6
Queue Length 50th (ft)	16	28	29	39	0	41	38	17
Queue Length 95th (ft)	42	75	64	106	26	82	87	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1984	140	2145	986	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.12	0.34	0.15	0.07	0.14	0.18	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	212	55	404	183	134	241	42	76	145
v/c Ratio	0.28	0.13	0.42	0.22	0.20	0.67	0.57	0.13	0.59	0.42
Control Delay	46.9	15.4	46.9	17.2	4.2	48.6	34.4	9.0	62.2	31.7
Queue Delay	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.4	46.9	17.7	4.7	48.6	34.4	9.0	62.2	31.7
Queue Length 50th (ft)	19	27	34	65	0	83	150	0	50	88
Queue Length 95th (ft)	47	70	71	142	46	140	181	25	#103	93
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1679	164	1825	905	266	671	469	142	537
Starvation Cap Reductn	0	0	0	955	398	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.34	0.46	0.36	0.50	0.36	0.09	0.54	0.27

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	311	75	580	164	120	37
v/c Ratio	0.04	0.17	0.53	0.26	0.87	0.28	0.26
Control Delay	47.3	17.8	49.9	8.2	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.8	49.9	8.4	52.9	6.6	37.5
Queue Length 50th (ft)	2	56	43	22	99	0	21
Queue Length 95th (ft)	11	120	m90	187	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1803	195	2066	337	515	323
Starvation Cap Reductn	0	0	0	696	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.38	0.41	0.69	0.23	0.11

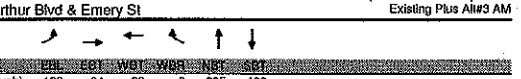
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	316	32	477	260	785	147	795
v/c Ratio	0.62	0.51	0.18	0.75	0.54	0.45	0.73	0.49
Control Delay	60.1	39.6	47.1	43.0	44.7	20.7	47.6	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	39.6	47.1	43.0	44.7	20.7	47.6	21.6
Queue Length 50th (ft)	45	42	16	106	80	183	92	194
Queue Length 95th (ft)	122	141	m49	188	121	290	149	279
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1024	190	781	481	1731	301	1629
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.31	0.17	0.63	0.54	0.45	0.49	0.49

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	337	7	481	145	318
v/c Ratio	0.27	0.15	0.05	0.23	0.27	0.60
Control Delay	12.5	5.8	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	5.8	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	46	2	21	16	36
Queue Length 95th (ft)	m24	88	11	67	36	68
Internal Link Dist (ft)		418		1192	922	299
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2249	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.23	0.24	0.55

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	64	29	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.28	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1021	860
v/c Ratio	0.57	0.58	0.44	0.37
Control Delay	46.2	43.7	9.8	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.8	9.0
Queue Length 50th (ft)	58	76	154	120
Queue Length 95th (ft)	92	112	238	188
Internal Link Dist (ft)	2	922	3	796
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2316	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.44	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	485	757
v/c Ratio	0.35	0.96	0.25	0.25
Control Delay	25.8	30.5	10.8	10.4
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	25.8	30.5	11.4	10.4
Queue Length 50th (ft)	92	236	81	87
Queue Length 95th (ft)	130	#487	111	112
Internal Link Dist (ft)	983		192	396
Turn Bay Length (ft)		70		
Base Capacity (vph)	1238	812	1978	3052
Starvation Cap Reductn	0	0	1091	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.89	0.55	0.25

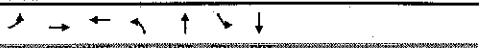
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	524	240	540
v/c Ratio	0.51	0.27	0.46	0.20
Control Delay	22.3	8.9	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	8.9	28.9	3.2
Queue Length 50th (ft)	41	53	50	25
Queue Length 95th (ft)	71	96	78	45
Internal Link Dist (ft)	999	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1395	1950	636	2689
Starvation Cap Reductn	0	0	0	1596
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.38	0.49

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	813	114	867	185	569	141	284	501
v/c Ratio	0.87	0.80	0.61	0.80	0.59	0.90	0.44	0.84	0.93
Control Delay	61.6	29.1	68.0	28.1	47.9	56.2	43.1	57.2	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	29.1	68.0	28.1	47.9	56.2	43.1	57.2	20.8
Queue Length 50th (ft)	194	239	77	260	129	205	87	191	71
Queue Length 95th (ft)	#330	317	m111	#433	m179	m#279	149	#313	#246
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1962	228	1090	322	646	354	373	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.80	0.51	0.80	0.57	0.88	0.40	0.76	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

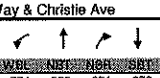


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	863	187	1093	197	994
v/c Ratio	0.78	0.69	0.89	0.76	0.74	0.82	0.68
Control Delay	46.6	32.2	35.9	58.7	32.2	72.7	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	32.2	35.9	58.7	32.2	72.7	30.9
Queue Length 50th (ft)	76	300	295	126	328	157	295
Queue Length 95th (ft)	m118	m333	318	#217	#545	#258	#490
Internal Link Dist (ft)		1299	1605		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	173	1518	1249	274	1469	241	1457
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.53	0.69	0.68	0.74	0.82	0.68

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

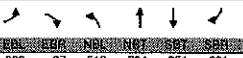
Lane Group	EBT	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	425	184	177	699	21	505
v/c Ratio	1.00	0.39	0.80	0.72	0.12	0.76
Control Delay	66.2	17.4	45.7	18.3	22.5	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	17.4	45.7	18.3	22.5	22.6
Queue Length 50th (ft)	132	44	56	191	6	116
Queue Length 95th (ft)	#295	90	m#127	#444	m16	174
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	427	475	225	972	225	666
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.39	0.79	0.72	0.09	0.76

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	774	525	251	678
v/c Ratio	0.48	0.33	0.31	0.46
Control Delay	9.0	2.8	0.7	21.9
Queue Delay	1.2	0.6	1.0	0.0
Total Delay	10.2	3.4	1.6	21.9
Queue Length 50th (ft)	157	13	0	168
Queue Length 95th (ft)	98	m11	m0	220
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1610	1609	813	1481
Starvation Cap Reductn	575	679	340	0
Spillback Cap Reductn	180	0	0	23
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.56	0.53	0.47

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	233	37	513	704	251	261
v/c Ratio	0.75	0.05	0.58	0.50	0.20	0.64
Control Delay	24.5	0.1	22.5	3.4	21.8	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.5	0.1	22.5	3.4	21.8	19.5
Queue Length 50th (ft)	62	0	64	28	109	68
Queue Length 95th (ft)	103	m0	80	505	196	147
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	883	1155	1402	857	533
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.04	0.44	0.50	0.29	0.49

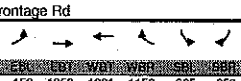
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

1011: I-80 WB Ramps & Frontage Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NB1	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	270	285	12	705	1349	274	625
v/c Ratio	0.59	1.18	0.21	0.76	0.80	0.13	0.85	0.85	0.84	0.77
Control Delay	44.6	143.4	28.1	39.2	40.2	47.0	40.5	6.5	45.3	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	143.4	28.1	39.2	40.2	47.0	40.5	6.5	45.3	29.4
Queue Length 50th (ft)	103	~304	22	156	166	7	206	0	163	273
Queue Length 95th (ft)	#202	#524	64	254	268	26	#328	0	#261	#589
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	923	340	306	453	456	251	904	1583	402	820
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.18	0.21	0.60	0.63	0.05	0.78	0.85	0.68	0.76

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1012: Powell St & Frontage Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1221	1152	865	359
v/c Ratio	0.47	0.46	0.86	0.82	0.87	0.51
Control Delay	45.8	4.9	15.6	16.6	41.9	6.3
Queue Delay	0.0	0.0	154.6	0.0	0.4	0.0
Total Delay	45.8	4.9	170.2	16.6	42.3	6.3
Queue Length 50th (ft)	97	68	375	643	296	11
Queue Length 95th (ft)	163	117	m358	m579	357	79
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2273	1427	1399	1124	745
Starvation Cap Reductn	0	0	518	0	0	0
Spillback Cap Reductn	0	6	0	0	44	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.46	1.34	0.82	0.80	0.48

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

1013: Powell St & I-80 EB Off-Ramp

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1140	1775	516	598	744	498
v/c Ratio	0.46	0.77	1.06	0.69	1.06	1.26	1.43
Control Delay	65.3	13.4	64.7	10.3	90.5	168.8	232.9
Queue Delay	0.0	2.1	127.5	0.5	8.6	2.0	0.0
Total Delay	65.3	15.5	192.2	10.8	99.1	170.7	232.9
Queue Length 50th (ft)	111	73	~538	66	~488	~684	~798
Queue Length 95th (ft)	m156	100	m#589	m75	#716	#942	#1150
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	930	1480	1667	753	565	590	349
Starvation Cap Reductn	0	212	115	49	0	0	0
Spillback Cap Reductn	0	89	366	0	12	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.89	1.34	0.73	1.08	1.29	1.43

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1014: Powell St & Christie Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NB1	NBR	SBT	SBR
Lane Group Flow (vph)	576	925	636	282	1075	223	78	82	72	406	949
v/c Ratio	1.08	0.92	0.90	1.03	1.01	0.44	0.36	0.38	0.27	0.82	0.78
Control Delay	94.7	39.2	19.9	108.6	68.5	28.4	50.2	50.5	24.8	42.7	12.0
Queue Delay	0.0	3.6	1.7	0.0	165.7	0.0	0.0	0.0	0.0	26.6	0.4
Total Delay	94.7	42.8	21.6	108.6	235.2	28.4	50.2	50.5	24.8	69.3	12.4
Queue Length 50th (ft)	~238	283	293	~214	~408	103	63	66	20	253	59
Queue Length 95th (ft)	m#246	m299	m336	#382	#554	177	116	121	68	#429	107
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	504	214	217	264	494	1208
Starvation Cap Reductn	0	42	18	0	0	0	0	0	0	98	32
Spillback Cap Reductn	0	0	0	0	296	0	0	0	0	0	43
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.96	0.93	1.03	1.40	0.44	0.36	0.38	0.27	1.03	0.81

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1059	288
v/c Ratio	0.13	0.12	0.45	0.42	0.51	0.68	0.43
Control Delay	30.4	29.2	6.0	50.5	12.6	25.8	44.2
Queue Delay	1.3	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	31.7	29.2	6.7	50.5	12.6	25.8	44.2
Queue Length 50th (ft)	61	50	0	35	0	297	209
Queue Length 95th (ft)	102	82	136	73	52	371	295
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1725	241	307	1603	668
Starvation Cap Reductn	377	0	575	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.67	0.21	0.34	0.68	0.43

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	901	22	683	551	484	63	215	170
v/c Ratio	1.14	0.87	0.24	0.93	0.75	0.63	0.25	0.82	0.47
Control Delay	160.0	46.6	55.7	63.5	36.0	31.2	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	6.6	2.7	0.0	0.0	0.0
Total Delay	160.0	46.6	55.7	63.5	42.7	33.8	43.8	49.2	12.1
Queue Length 50th (ft)	~153	292	15	248	297	249	30	134	3
Queue Length 95th (ft)	#295	#490	42	#363	#569	457	93	241	92
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1040	97	731	732	763	499	525	556
Starvation Cap Reductn	0	0	0	0	136	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.87	0.23	0.93	0.92	0.82	0.13	0.41	0.31

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	626	109	477	152	1189	122	1053
v/c Ratio	0.76	0.85	0.64	0.55	0.71	0.91	0.69	0.85
Control Delay	59.5	38.4	49.9	29.5	47.6	40.4	53.4	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	38.4	49.9	29.5	47.6	40.4	53.4	37.5
Queue Length 50th (ft)	78	220	60	114	83	386	67	307
Queue Length 95th (ft)	#165	#317	113	161	145	#520	#137	#467
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	981	197	977	256	1308	197	1234
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.64	0.55	0.49	0.59	0.91	0.62	0.85

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	869	87	651	29	234	232	182
v/c Ratio	0.25	0.67	0.57	0.96	0.04	0.76	0.89	0.65
Control Delay	48.1	25.4	57.5	20.0	9.9	41.8	32.3	39.3
Queue Delay	0.0	1.6	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	48.1	26.9	57.5	20.6	9.9	41.8	32.3	39.3
Queue Length 50th (ft)	16	201	59	105	0	145	111	109
Queue Length 95th (ft)	42	#438	#120	273	23	203	171	154
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1533	158	1797	784	476	492	492
Starvation Cap Reductn	0	444	0	748	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.80	0.55	0.62	0.04	0.49	0.47	0.37

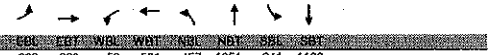
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	726	153	541	196	208	299	125	192	384
v/c Ratio	0.39	0.57	0.74	0.35	0.26	0.98	0.69	0.28	0.91	0.90
Control Delay	46.8	27.7	56.3	22.0	4.5	102.9	38.3	6.2	84.2	42.4
Queue Delay	0.0	1.1	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.9	56.3	22.8	4.9	102.9	38.3	6.2	84.2	42.4
Queue Length 50th (ft)	31	190	94	123	0	134	179	0	125	237
Queue Length 95th (ft)	67	273	#177	192	48	#279	247	42	#256	287
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1284	234	1531	757	212	640	530	212	631
Starvation Cap Reductn	0	321	0	647	240	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.75	0.65	0.61	0.38	0.98	0.65	0.24	0.91	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	945	135	859	328	255	191
v/c Ratio	0.16	0.72	0.70	0.59	0.86	0.50	0.71
Control Delay	40.0	33.4	52.2	18.6	47.6	8.6	45.0
Queue Delay	0.0	13.0	0.0	0.4	0.0	0.0	0.0
Total Delay	40.0	46.4	52.2	19.0	47.6	8.6	45.0
Queue Length 50th (ft)	19	286	91	110	201	12	115
Queue Length 95th (ft)	47	#486	m54	m#288	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1305	301	1454	452	562	448
Starvation Cap Reductn	0	352	0	188	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.99	0.45	0.68	0.73	0.45	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	900	50	591	457	1051	241	1163
v/c Ratio	0.92	0.91	0.52	0.92	1.02	0.78	0.95	0.85
Control Delay	57.3	36.5	61.3	48.9	92.9	32.6	90.0	34.9
Queue Delay	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	38.9	61.3	48.9	92.9	32.6	90.0	35.8
Queue Length 50th (ft)	145	74	33	184	~160	311	155	353
Queue Length 95th (ft)	m#239	#357	m71	#251	#259	394	#308	#462
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	251	986	106	678	446	1345	253	1373
Starvation Cap Reductn	0	34	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.95	0.47	0.87	1.02	0.78	0.95	0.89

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	725	10	596	276	377
v/c Ratio	0.10	0.33	0.07	0.27	0.49	0.66
Control Delay	20.7	6.4	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	6.4	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	96	3	27	35	36
Queue Length 95th (ft)	m7	m113	14	81	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2219	248	2177	649	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.04	0.27	0.43	0.59

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	99	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	0	9	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	894
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1158	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

Lane Group	EBL	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1293	1431
v/c Ratio	0.69	0.63	0.60	0.66
Control Delay	46.8	43.3	14.4	15.7
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.8	15.7
Queue Length 50th (ft)	90	88	255	302
Queue Length 95th (ft)	131	127	380	447
Internal Link Dist (ft)	2	922	9	798
Turn Bay Length (ft)				
Base Capacity (vph)	468	596	2171	2185
Starvation Cap Reductn	0	0	393	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.73	0.66

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	921	1335
v/c Ratio	0.31	1.02	0.47	0.43
Control Delay	25.4	67.5	10.6	9.7
Queue Delay	0.1	0.0	5.4	0.1
Total Delay	25.5	67.5	16.0	9.8
Queue Length 50th (ft)	75	~262	137	193
Queue Length 95th (ft)	111	#502	181	163
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	585	1946	3103
Starvation Cap Reductn	0	0	950	0
Spillback Cap Reductn	148	0	0	563
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.02	0.92	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	949	643	778
v/c Ratio	0.82	0.61	0.82	0.31
Control Delay	44.3	26.5	43.5	6.6
Queue Delay	0.2	0.8	12.7	1.9
Total Delay	44.6	27.3	56.2	8.5
Queue Length 50th (ft)	216	261	223	95
Queue Length 95th (ft)	272	385	270	140
Internal Link Dist (ft)	990	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1526
Spillback Cap Reductn	36	319	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.76	0.97	0.79

Intersection Summary

Queues
1009: Shellmound Way & Christie Ave
Existing Plus Alt#3 SAT

Lane Group	WBL	WBT	NBR	SBT
Lane Group Flow (vph)	1001	541	448	705
v/c Ratio	0.58	0.37	0.53	0.52
Control Delay	7.1	12.6	8.2	25.5
Queue Delay	1.8	1.5	5.6	0.1
Total Delay	8.9	14.1	14.1	25.6
Queue Length 50th (ft)	59	147	239	191
Queue Length 95th (ft)	66	m122	m221	247
Internal Link Dist (ft)	842	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1732	1480	850	1357
Starvation Cap Reductn	536	720	337	0
Spillback Cap Reductn	384	0	25	108
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.71	0.87	0.56

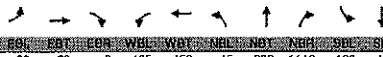
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St
Existing Plus Alt#3 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	403	55	717	942	308	301
v/c Ratio	0.89	0.06	0.81	0.75	0.44	0.28
Control Delay	27.5	0.1	17.2	20.8	30.1	6.8
Queue Delay	0.9	0.0	0.0	2.9	0.0	0.0
Total Delay	28.3	0.1	17.2	23.7	30.1	6.8
Queue Length 50th (ft)	96	0	190	661	164	56
Queue Length 95th (ft)	#398	m0	m201	m776	276	118
Internal Link Dist (ft)	342			739	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1018	1186	1252	704	1122
Starvation Cap Reductn	15	0	0	203	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.05	0.61	0.90	0.44	0.27

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

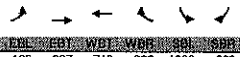
Queues
1011: I-80 WB Ramps & Frontage Rd
Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	465	452	45	282	1146	130	479
v/c Ratio	0.21	0.16	0.06	0.71	0.69	0.30	0.31	0.72	0.58	0.80
Control Delay	35.8	35.5	20.7	31.0	29.8	35.3	23.1	2.9	32.6	28.5
Queue Delay	0.0	0.0	0.0	1.2	1.0	0.0	0.0	0.0	0.0	0.7
Total Delay	35.8	35.5	20.7	32.2	30.8	35.3	23.1	2.9	32.6	29.1
Queue Length 50th (ft)	13	11	0	228	213	21	55	0	61	206
Queue Length 95th (ft)	39	34	13	#436	#422	54	97	0	115	#388
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	843	861	313	655	657	327	1119	1583	455	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	15	62	62	0	0	0	0	62
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.78	0.76	0.14	0.25	0.72	0.29	0.79

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

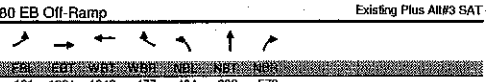
Queues
1012: Powell St & Frontage Rd
Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	749	998	1068	263
v/c Ratio	0.68	0.15	0.53	0.71	0.88	0.36
Control Delay	51.4	12.5	18.0	15.6	35.0	4.3
Queue Delay	0.0	0.0	2.9	0.0	7.9	0.0
Total Delay	51.4	12.5	20.9	15.6	42.9	4.3
Queue Length 50th (ft)	85	49	220	518	367	8
Queue Length 95th (ft)	141	84	302	674	400	54
Internal Link Dist (ft)		918	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2012	1415	1399	1592	868
Starvation Cap Reductn	0	0	535	0	261	0
Spillback Cap Reductn	0	0	0	0	465	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.15	0.85	0.71	0.97	0.30

Intersection Summary

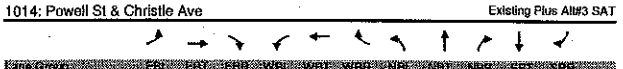
Queues
1013: Powell St & I-80 EB Off-Ramp
Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1264	1342	477	404	602	579
v/c Ratio	0.74	1.06	0.80	0.57	0.55	0.76	1.48
Control Delay	67.5	63.2	30.5	5.3	26.5	20.1	251.3
Queue Delay	0.0	143.9	0.6	0.2	0.3	0.0	0.0
Total Delay	67.5	207.1	31.3	5.5	26.9	20.1	251.3
Queue Length 50th (ft)	69	~869	397	38	217	207	~962
Queue Length 95th (ft)	m115	#446	404	m61	320	362	#959
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1678	832	734	795	392
Starvation Cap Reductn	0	265	119	51	0	0	0
Spillback Cap Reductn	0	0	66	0	64	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.30	0.86	0.61	0.60	0.76	1.48

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

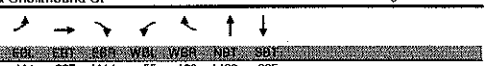
Queues
1014: Powell St & Christie Ave
Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	692	1109	620	293	480	235	153	161	110	507	1079
v/c Ratio	1.17	0.95	1.01	1.07	0.45	0.42	0.84	0.86	0.42	1.02	0.80
Control Delay	126.5	29.9	30.9	119.0	32.9	15.2	91.5	93.8	26.5	73.9	30.3
Queue Delay	21.3	2.4	1.3	0.0	0.1	0.2	0.0	0.0	0.0	88.3	2.2
Total Delay	147.8	32.3	32.2	119.0	32.9	15.4	91.5	93.8	26.5	162.2	32.5
Queue Length 50th (ft)	~297	240	~209	250	144	61	121	127	25	~391	423
Queue Length 95th (ft)	m#270	m219	m185	#401	193	121	m#235	m#249	m69	#582	495
Internal Link Dist (ft)		365			570			520		295	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1169	616	274	1062	555	183	188	261	497	1344
Starvation Cap Reductn	0	25	3	0	0	0	0	0	0	89	147
Spillback Cap Reductn	24	0	0	0	53	53	0	0	0	0	21
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.97	1.01	1.07	0.48	0.47	0.84	0.86	0.42	1.24	0.90

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

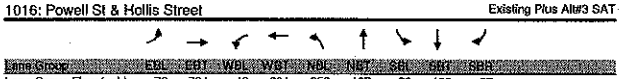
Queues
1015: Christie Ave & Shellmound St
Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1438	365
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.88	0.56
Control Delay	31.3	30.3	32.9	50.5	12.1	24.4	34.7
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.9	0.0
Total Delay	32.5	31.0	34.9	50.5	12.6	24.8	34.7
Queue Length 50th (ft)	67	69	260	38	0	533	248
Queue Length 95th (ft)	135	117	381	78	57	630	#388
Internal Link Dist (ft)		150				820	730
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1641	241	328	1639	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	11	0	0	0	38	23	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.45	0.89	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street
Existing Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	724	40	681	250	187	38	190	97
v/c Ratio	0.56	0.46	0.33	0.48	0.67	0.48	0.11	0.54	0.26
Control Delay	50.0	17.5	37.9	22.0	26.4	22.6	21.2	25.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	17.5	37.9	22.0	26.4	22.6	21.2	25.0	6.8
Queue Length 50th (ft)	27	97	15	119	84	57	12	64	0
Queue Length 95th (ft)	#93	#219	44	#223	163	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		90				70		
Base Capacity (vph)	129	1588	123	1426	467	488	458	493	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.46	0.33	0.48	0.54	0.38	0.08	0.39	0.21

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

Existing Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1043	165	1073	204	197	59
v/c Ratio	0.32	0.63	1.04	0.53	0.72	0.48	0.24
Control Delay	62.4	14.5	104.5	13.6	42.4	7.0	27.7
Queue Delay	0.0	0.3	0.0	1.2	0.0	0.0	0.0
Total Delay	62.4	14.8	104.5	14.8	42.4	7.0	27.7
Queue Length 50th (ft)	14	41	~117	67	126	0	27
Queue Length 95th (ft)	m22	#540	m#169	m#431	182	54	55
Internal Link Dist (ft)		1232		264	457		284
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1660	159	2034	441	530	445
Starvation Cap Reductn	0	0	0	678	0	0	0
Spillback Cap Reductn	0	164	0	0	0	9	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.70	1.04	0.79	0.46	0.38	0.13

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

Existing Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	943	75	539	529	728	123	943
v/c Ratio	0.80	0.85	0.74	0.64	0.95	0.57	0.58	0.91
Control Delay	63.6	18.6	80.7	37.4	71.0	27.8	50.5	45.3
Queue Delay	0.0	1.5	0.0	0.7	16.1	0.0	0.0	0.1
Total Delay	63.6	20.1	80.7	38.1	87.1	27.8	50.5	45.4
Queue Length 50th (ft)	84	266	48	160	172	192	77	292
Queue Length 95th (ft)	#217	#362	#121	219	#274	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1110	105	839	549	1287	239	1041
Starvation Cap Reductn	0	60	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	39	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.90	0.71	0.72	1.03	0.57	0.51	0.91

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #3
2010

Queues
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2010 Plus Alt#3 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1233	109	813	123	303	64	223	208
v/c Ratio	0.97	0.73	0.63	0.86	0.51	0.69	0.24	0.79	0.50
Control Delay	67.5	26.0	51.0	57.0	51.7	46.6	41.8	56.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	26.0	51.0	57.0	51.7	46.6	41.8	56.5	9.2
Queue Length 50th (ft)	374	358	79	321	83	99	40	151	0
Queue Length 95th (ft)	#593	476	m113	#465	141	143	79	#241	64
Internal Link Dist (ft)		1600		1289		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1678	193	944	267	521	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.73	0.56	0.86	0.46	0.58	0.21	0.69	0.47

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	890	770	204	779	124	951
v/c Ratio	0.75	0.71	0.84	0.83	0.57	0.48	0.69
Control Delay	23.7	15.7	34.0	68.5	29.9	50.2	32.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	15.7	34.0	68.5	29.9	50.2	32.4
Queue Length 50th (ft)	24	80	246	141	226	82	293
Queue Length 95th (ft)	m31	67	291	#258	323	142	#441
Internal Link Dist (ft)		1299	1505		896		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	207	1522	1113	257	1359	257	1376
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.58	0.69	0.79	0.57	0.48	0.69

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	69	69	100	167	279	125	334
v/c Ratio	0.12	0.08	0.15	0.19	0.70	0.29	0.47
Control Delay	12.5	11.2	9.9	3.3	20.3	11.5	11.1
Queue Delay	0.0	0.0	0.3	0.3	0.0	0.0	0.0
Total Delay	12.5	11.2	10.3	3.6	20.3	11.5	11.1
Queue Length 50th (ft)	14	13	16	0	79	27	67
Queue Length 95th (ft)	42	38	42	28	131	44	99
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	587	900	646	872	597	448	990
Starvation Cap Reductn	0	0	261	354	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.08	0.26	0.32	0.47	0.28	0.34

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	281	26	205	73
v/c Ratio	0.19	0.03	0.13	0.33
Control Delay	2.0	2.3	2.2	21.5
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	2.3	2.3	2.2	21.5
Queue Length 50th (ft)	18	2	14	21
Queue Length 95th (ft)	50	7	33	52
Internal Link Dist (ft)	114		863	743
Turn Bay Length (ft)				
Base Capacity (vph)	1563	835	1569	780
Starvation Cap Reductn	758	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.03	0.13	0.09

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	313	127	38	323	24	553
v/c Ratio	0.84	0.44	0.19	0.29	0.14	0.54
Control Delay	38.2	22.6	18.4	7.8	20.9	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	22.6	18.4	7.8	20.9	11.6
Queue Length 50th (ft)	67	32	10	30	7	63
Queue Length 95th (ft)	#186	73	27	137	23	#234
Internal Link Dist (ft)	663	1768		675		814
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	374	291	283	1109	283	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.44	0.13	0.29	0.08	0.54

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	213	199	62	331	157	471
v/c Ratio	0.65	0.59	0.83	0.77	0.11	0.14	0.14	0.21
Control Delay	72.9	20.3	82.1	75.2	0.5	0.4	0.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	82.1	75.2	0.5	0.4	0.2	6.8
Queue Length 50th (ft)	45	0	140	133	1	1	0	55
Queue Length 95th (ft)	#112	56	#268	#236	m1	1	m0	76
Internal Link Dist (ft)	75			335		284		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	588	2366	1110	2211
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.79	0.73	0.11	0.14	0.14	0.21

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	112	45	266	255	106	196
v/c Ratio	0.59	0.09	0.56	0.17	0.09	0.57
Control Delay	39.3	20.9	38.3	0.5	9.0	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	20.9	38.3	0.5	9.0	8.5
Queue Length 50th (ft)	66	0	56	2	20	0
Queue Length 95th (ft)	m113	m30	75	5	55	61
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	826	1236	1513	1178	487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.05	0.22	0.17	0.09	0.40

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WB1	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	400	421	93	96	952	80	329
v/c Ratio	0.03	0.14	0.11	0.81	0.63	0.44	0.10	0.60	0.40	0.66
Control Delay	35.8	36.0	18.2	25.1	25.6	33.1	19.6	1.7	32.8	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	18.2	25.1	25.6	33.1	19.6	1.7	32.8	23.4
Queue Length 50th (ft)	2	9	0	153	163	39	16	0	34	126
Queue Length 95th (ft)	14	35	20	#370	#396	93	36	0	83	230
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	397	418	368	730	739	366	1329	1583	496	759
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.55	0.57	0.24	0.07	0.60	0.16	0.43

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	755	1103	859	136
v/c Ratio	0.37	0.20	0.56	0.77	0.85	0.24
Control Delay	39.1	4.9	17.4	14.1	35.0	4.7
Queue Delay	0.0	0.0	0.8	0.0	0.0	0.0
Total Delay	39.1	4.9	18.3	14.1	35.0	4.7
Queue Length 50th (ft)	70	28	97	584	262	0
Queue Length 95th (ft)	126	58	m184	m721	303	38
Internal Link Dist (ft)		618	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2138	1340	1441	1378	715
Starvation Cap Reductn	0	0	294	0	0	0
Spillback Cap Reductn	0	1	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.72	0.77	0.64	0.19

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	1007	1215	376	560	655	645
v/c Ratio	0.24	0.42	0.82	0.49	0.88	1.03	0.91
Control Delay	25.7	9.0	20.7	2.6	45.7	69.8	41.9
Queue Delay	0.0	2.0	0.4	0.1	0.0	7.8	4.1
Total Delay	25.7	11.0	21.0	2.7	45.7	77.6	46.0
Queue Length 50th (ft)	17	163	154	9	343	#432	361
Queue Length 95th (ft)	m42	139	238	m16	#555	#675	#610
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	762	639	636	711
Starvation Cap Reductn	0	1185	0	41	0	0	0
Spillback Cap Reductn	0	143	46	0	0	14	33
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.84	0.84	0.52	0.88	1.05	0.95

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	458	1375	389	79	782	103	23	24	44	241	771
v/c Ratio	0.66	0.98	0.41	0.61	0.82	0.23	0.20	0.21	0.29	0.45	0.61
Control Delay	46.7	35.5	1.6	60.1	42.5	22.5	44.4	44.4	15.5	37.7	5.5
Queue Delay	0.0	9.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0
Total Delay	46.7	44.7	1.8	60.1	42.5	22.5	44.4	44.4	15.5	39.3	5.6
Queue Length 50th (ft)	146	~326	7	49	245	37	14	15	0	125	25
Queue Length 95th (ft)	m183	m#638	m13	#106	318	61	40	41	32	m184	81
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	690	1407	932	142	956	447	185	186	213	537	1509
Starvation Cap Reductn	0	56	109	0	0	0	0	0	0	158	25
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	1.02	0.47	0.56	0.82	0.23	0.12	0.13	0.21	0.64	0.52

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	535	157
v/c Ratio	0.07	0.07	0.23	0.23	0.15
Control Delay	26.1	25.9	2.6	7.7	10.6
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.1	25.9	3.3	7.7	10.6
Queue Length 50th (ft)	14	14	0	67	46
Queue Length 95th (ft)	38	31	23	91	64
Internal Link Dist (ft)		119		620	793
Turn Bay Length (ft)	200				
Base Capacity (vph)	445	910	1190	2277	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.23	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	765	38	570	267	248	29	212	108
v/c Ratio	0.67	0.47	0.20	0.70	0.81	0.72	0.11	0.74	0.32
Control Delay	57.5	19.0	46.7	40.0	45.5	41.4	28.0	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	19.0	46.7	40.0	45.5	41.4	28.0	38.9	10.3
Queue Length 50th (ft)	254	155	23	172	166	149	13	131	1
Queue Length 95th (ft)	#538	250	55	233	255	231	30	152	40
Internal Link Dist (ft)		159		1493		987		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	478	1615	159	810	407	426	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.47	0.24	0.70	0.66	0.58	0.08	0.54	0.26

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1017: Stanford Ave & San Pablo Avenue

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	408	105	466	134	634	52	672
v/c Ratio	0.80	0.60	0.62	0.69	0.65	0.35	0.41	0.54
Control Delay	87.5	33.1	51.1	38.0	46.2	15.9	45.9	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	33.1	51.1	38.0	46.2	15.9	45.9	22.2
Queue Length 50th (ft)	63	108	65	146	93	118	32	197
Queue Length 95th (ft)	#154	152	118	185	137	193	69	317
Internal Link Dist (ft)		207		2595		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	695	212	1058	301	1831	230	1624
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.46	0.50	0.44	0.45	0.35	0.23	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1018: 40th St & Horton St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	387	45	371	186	86	197	88
v/c Ratio	0.24	0.21	0.37	0.19	0.19	0.34	0.74	0.37
Control Delay	47.9	14.8	49.9	14.5	4.0	38.3	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	14.8	49.9	14.5	4.0	38.3	40.7	36.0
Queue Length 50th (ft)	16	56	28	44	0	50	116	50
Queue Length 95th (ft)	42	137	62	138	49	91	180	81
Internal Link Dist (ft)		240		258			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1840	138	1990	971	479	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.21	0.33	0.19	0.19	0.18	0.40	0.18

Intersection Summary

1019: 40th St & Hollis St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	341	55	555	197	144	268	41	138	206
v/c Ratio	0.27	0.21	0.42	0.31	0.22	0.69	0.62	0.10	0.97	0.58
Control Delay	46.8	17.5	48.9	18.5	4.2	49.6	34.8	7.4	116.7	31.1
Queue Delay	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.5	48.9	19.3	4.7	49.6	34.8	7.4	116.7	31.1
Queue Length 50th (ft)	18	59	34	100	0	89	166	0	95	99
Queue Length 95th (ft)	46	116	71	196	48	149	202	23	#217	119
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1638	164	1781	894	266	671	596	142	539
Starvation Cap Reductn	0	0	0	872	378	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.21	0.34	0.61	0.38	0.54	0.40	0.07	0.97	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

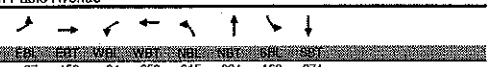
1021: 40th St & Emery St

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	477	128	715	247	127	38
v/c Ratio	0.04	0.27	0.67	0.32	0.79	0.34	0.25
Control Delay	47.3	18.1	57.2	8.6	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.4	57.2	8.8	42.7	7.2	36.5
Queue Length 50th (ft)	2	88	62	18	153	0	21
Queue Length 95th (ft)	11	181	m120	m231	221	45	45
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1755	210	2227	487	520	329
Starvation Cap Reductn	0	673	0	725	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.44	0.61	0.48	0.51	0.24	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

1022: 40th St & San Pablo Avenue



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	456	34	653	315	834	168	974
v/c Ratio	0.63	0.59	0.21	0.90	0.65	0.53	0.77	0.64
Control Delay	61.5	30.9	47.3	48.1	47.9	24.4	49.1	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.5	30.9	47.3	48.1	47.9	24.4	49.1	26.8
Queue Length 50th (ft)	44	53	17	162	99	214	105	269
Queue Length 95th (ft)	119	190	m50	#267	144	318	168	368
Internal Link Dist (ft)		271		418		796		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1038	179	789	481	1578	301	1511
Starvation Cap Reductn	0	0	0	0	0	0	0	68
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.44	0.19	0.83	0.65	0.53	0.56	0.67

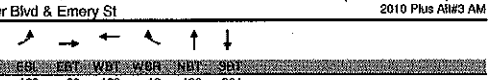
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1023: 40th St & Adeline St

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	436	82	644	240	394
v/c Ratio	0.28	0.23	0.44	0.31	0.40	0.73
Control Delay	16.5	8.8	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	8.8	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	20	80	23	40	25	51
Queue Length 95th (ft)	m29	113	55	93	51	#104
Internal Link Dist (ft)		438		1192	992	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2045	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.23	0.39	0.31	0.39	0.71

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1025: W. MacArthur Blvd & Emery St



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.51	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	6	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	658	594	1090	1061
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

1026: Adeline St & San Pablo Avenue

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1135	1107
v/c Ratio	0.72	0.74	0.54	0.53
Control Delay	54.3	46.4	14.4	14.2
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.7	14.2
Queue Length 50th (ft)	94	136	232	222
Queue Length 95th (ft)	#144	185	304	292
Internal Link Dist (ft)		2	922	3	798
Turn Bay Length (ft)					
Base Capacity (vph)	389	631	2085	2079
Starvation Cap Reductn	0	0	370	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.65	0.53

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	553	756	551	1066
v/c Ratio	0.44	0.99	0.30	0.36
Control Delay	25.3	45.7	12.5	12.9
Queue Delay	0.0	0.0	1.6	0.0
Total Delay	25.3	45.7	14.0	12.9
Queue Length 50th (ft)	136	316	94	133
Queue Length 95th (ft)	184	#583	128	164
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1302	779	1822	2939
Starvation Cap Reductn	0	0	1046	0
Spillback Cap Reductn	14	0	0	56
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.97	0.71	0.39

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	589	457	629
v/c Ratio	0.68	0.37	0.75	0.25
Control Delay	25.3	13.5	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.6
Total Delay	25.3	13.5	34.4	5.2
Queue Length 50th (ft)	93	81	96	43
Queue Length 95th (ft)	130	131	#143	76
Internal Link Dist (ft)	599	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1611	698	2462
Starvation Cap Reductn	0	0	0	1347
Spillback Cap Reductn	35	11	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.37	0.72	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1019	146	974	196	610	146	332	509
v/c Ratio	0.90	0.80	0.72	0.96	0.61	0.94	0.43	0.92	0.83
Control Delay	67.1	36.7	59.1	45.1	48.7	63.5	42.7	69.9	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.7	59.1	45.1	48.7	63.5	42.7	69.9	23.4
Queue Length 50th (ft)	210	336	100	~389	137	222	91	230	87
Queue Length 95th (ft)	#361	424	m103	m#398	m177	m#299	154	#393	#270
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1271	225	1011	322	646	354	373	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.65	0.96	0.61	0.94	0.41	0.89	0.82

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	934	284	1257	196	1262
v/c Ratio	1.40	0.62	0.91	1.04	1.13	0.81	1.20
Control Delay	233.5	25.7	42.6	110.4	103.7	72.2	134.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	233.5	25.7	42.6	110.4	103.7	72.2	134.2
Queue Length 50th (ft)	~199	314	311	~217	~540	136	~567
Queue Length 95th (ft)	m#278	m374	#450	#386	#578	#257	#705
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	148	1517	1024	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	0.62	0.91	1.04	1.13	0.81	1.20

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	145	89	219	351	760	94	433
v/c Ratio	0.72	0.15	0.52	0.59	0.94	0.25	0.43
Control Delay	46.9	16.6	27.8	16.8	31.7	8.5	8.2
Queue Delay	0.0	0.0	2.0	1.8	1.1	0.0	0.0
Total Delay	46.9	16.6	29.8	18.5	32.9	8.5	8.2
Queue Length 50th (ft)	49	23	78	67	221	13	67
Queue Length 95th (ft)	#142	53	#155	149	#441	28	116
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	201	599	421	660	841	381	1087
Starvation Cap Reductn	0	0	96	169	0	0	0
Spillback Cap Reductn	0	0	0	0	16	5	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.15	0.67	0.71	0.92	0.25	0.40

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	458	35	449	141
v/c Ratio	0.34	0.07	0.33	0.54
Control Delay	1.6	3.5	4.2	20.6
Queue Delay	1.6	0.0	0.1	0.0
Total Delay	3.2	3.5	4.3	20.6
Queue Length 50th (ft)	8	0	43	42
Queue Length 95th (ft)	m11	11	96	83
Internal Link Dist (ft)	114		668	749
Turn Bay Length (ft)				
Base Capacity (vph)	1346	478	1352	770
Starvation Cap Reductn	684	0	0	0
Spillback Cap Reductn	0	0	241	2
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.07	0.40	0.18

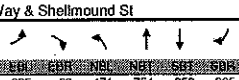
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	503	202	172	738	20	588
v/c Ratio	1.19	0.43	0.78	0.76	0.12	0.87
Control Delay	131.0	18.3	44.3	20.0	22.6	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	131.0	18.3	44.3	20.0	22.6	29.6
Queue Length 50th (ft)	~205	50	56	205	8	157
Queue Length 95th (ft)	#366	100	m#128	#476	m13	m#265
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	422	472	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.43	0.76	0.76	0.09	0.87

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	19	100	377	358	144	515	253	665
v/c Ratio	0.17	0.54	0.50	0.46	0.72	0.98	0.95	0.53
Control Delay	50.6	16.8	7.8	6.9	42.2	20.7	4.9	27.7
Queue Delay	0.0	1.2	0.9	0.8	0.0	0.7	0.6	0.0
Total Delay	50.6	18.1	8.7	7.7	42.2	21.4	5.5	27.7
Queue Length 50th (ft)	12	0	74	66	53	78	19	185
Queue Length 95th (ft)	35	52	116	100	m64	m78	m14	243
Internal Link Dist (ft)	128			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	747	201	1358	713	1246
Starvation Cap Reductn	0	0	97	95	0	500	200	0
Spillback Cap Reductn	0	32	164	162	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.53	0.64	0.61	0.72	0.60	0.49	0.54

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

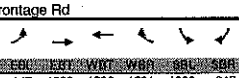


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	235	39	471	754	253	265
v/c Ratio	0.76	0.06	0.83	0.54	0.27	0.65
Control Delay	29.5	0.7	38.1	2.4	19.4	19.6
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	29.5	0.7	38.1	2.7	19.4	19.6
Queue Length 50th (ft)	89	0	102	14	103	68
Queue Length 95th (ft)	238	m2	114	18	193	147
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	883	1155	1401	929	534
Starvation Cap Reductn	0	0	0	174	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.04	0.41	0.61	0.27	0.50

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

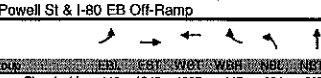
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	357	372	12	733	1467	283	645
v/c Ratio	0.61	1.24	0.22	0.87	0.91	0.14	0.90	0.93	0.86	0.80
Control Delay	48.0	169.7	28.9	50.4	53.2	47.6	48.0	12.3	51.0	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	169.7	28.9	50.4	53.2	47.6	48.0	12.3	51.0	33.1
Queue Length 50th (ft)	109	~322	23	226	237	7	238	0	171	320
Queue Length 95th (ft)	#193	#506	62	#389	#411	26	#350	#104	#294	#618
Internal Link Dist (ft)		785				24		715		241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	299	313	283	442	444	235	848	1583	378	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.24	0.22	0.81	0.84	0.05	0.86	0.93	0.75	0.80

Intersection Summary
Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1306	1201	1069	347
v/c Ratio	0.46	0.47	1.00dr	0.86	0.96	0.50
Control Delay	45.4	5.4	21.3	18.9	54.3	10.3
Queue Delay	0.0	0.0	211.9	0.0	4.5	0.0
Total Delay	45.4	5.4	233.2	18.9	58.8	10.3
Queue Length 50th (ft)	94	71	431	684	377	42
Queue Length 95th (ft)	158	114	m363	m553	#514	124
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340				190	
Base Capacity (vph)	322	2179	1308	1399	1124	696
Starvation Cap Reductn	0	0	477	0	0	0
Spillback Cap Reductn	0	0	0	0	37	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.48	0.86	0.98	0.50

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1343	1907	447	601	827	589
v/c Ratio	0.44	0.90	1.15	0.59	1.06	1.40	1.72
Control Delay	64.5	17.1	93.7	5.8	92.1	217.8	360.5
Queue Delay	0.0	41.8	158.3	0.3	31.5	31.2	74.4
Total Delay	64.5	58.9	252.0	6.2	123.6	249.1	434.9
Queue Length 50th (ft)	108	82	~613	32	~493	~800	~1047
Queue Length 95th (ft)	m132	m94	m#579	m33	#723	#1065	#1015
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	336	1489	1687	761	565	590	342
Starvation Cap Reductn	0	155	107	57	0	0	0
Spillback Cap Reductn	0	256	403	0	39	28	30
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.09	1.49	0.63	1.14	1.47	1.89

Intersection Summary
Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	626	1123	772	342	1236	297	76	80	69	440	867
v/c Ratio	1.18	1.11	1.10	1.25	1.16	0.58	0.36	0.37	0.26	0.89	0.72
Control Delay	130.7	89.1	70.8	174.4	119.7	35.3	50.0	50.4	25.1	59.8	11.9
Queue Delay	0.0	23.2	10.0	0.0	238.6	0.0	0.0	0.0	0.0	51.1	0.2
Total Delay	130.7	112.2	80.8	174.4	358.3	35.3	50.0	50.4	25.1	110.9	12.1
Queue Length 50th (ft)	~278	~491	~488	~296	~693	173	61	64	19	316	136
Queue Length 95th (ft)	m#227	m366	m263	#494	#697	279	113	118	66	#487	180
Internal Link Dist (ft)		965			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1012	701	274	1062	508	214	217	262	493	1209
Starvation Cap Reductn	0	47	15	0	0	0	0	0	0	95	47
Spillback Cap Reductn	0	0	0	0	334	0	0	0	0	0	49
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	1.16	1.13	1.25	1.70	0.58	0.36	0.37	0.26	1.11	0.75

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1226	292
v/c Ratio	0.17	0.17	0.46	0.59	0.48
Control Delay	33.1	32.0	8.9	15.9	41.4
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	35.4	33.3	9.4	15.9	41.4
Queue Length 50th (ft)	61	64	89	270	207
Queue Length 95th (ft)	118	104	148	334	302
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1885	2089	610
Starvation Cap Reductn	352	752	544	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.69	0.59	0.48

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1100	21	808	553	565	72	256	160
v/c Ratio	1.24	1.06	0.23	1.10	0.92	0.80	0.24	0.80	0.40
Control Delay	197.9	78.9	55.4	105.6	42.9	41.2	47.2	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	6.2	7.5	0.0	0.0	0.0
Total Delay	197.9	78.9	55.4	105.6	49.1	48.6	47.2	54.1	15.9
Queue Length 50th (ft)	~182	228	15	~341	332	333	51	187	13
Queue Length 95th (ft)	#328	#630	41	#467	#614	#615	100	273	86
Internal Link Dist (ft)		159		1403		357		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1037	97	735	677	707	499	526	540
Starvation Cap Reductn	0	0	0	0	84	107	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.06	0.22	1.10	0.93	0.94	0.14	0.49	0.29

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	895	107	569	188	1408	118	1256
v/c Ratio	0.83	0.90	0.64	0.65	0.80	1.09	0.67	1.08
Control Delay	69.8	43.4	49.4	31.6	55.8	85.1	52.2	80.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	43.4	49.4	31.6	55.8	85.1	52.2	80.8
Queue Length 50th (ft)	90	247	59	143	104	~526	65	~486
Queue Length 95th (ft)	#194	#365	112	196	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	994	197	972	256	1297	197	1168
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.90	0.54	0.58	0.73	1.09	0.60	1.08

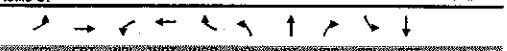
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1018: 40th St & Horton St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	939	84	718	58	262	270	313
v/c Ratio	0.26	0.71	0.58	0.48	0.09	0.80	0.77	0.84
Control Delay	48.8	32.3	58.8	26.2	8.4	42.5	35.4	43.2
Queue Delay	0.0	3.6	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	35.7	58.8	26.7	8.4	42.5	35.4	43.2
Queue Length 50th (ft)	17	264	52	181	0	162	138	191
Queue Length 95th (ft)	44	#492	#127	#334	32	227	206	266
Internal Link Dist (ft)		246		256			363	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1331	152	1508	679	478	491	494
Starvation Cap Reductn	0	292	0	377	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.90	0.55	0.63	0.09	0.55	0.55	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

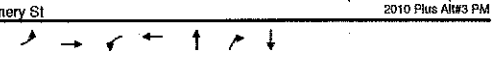
1019: 40th St & Hollis St



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	851	148	614	244	229	343	140	275	505
v/c Ratio	0.39	0.76	0.74	0.43	0.33	1.08	0.65	0.26	1.30	0.97
Control Delay	46.8	35.3	56.0	24.3	4.5	127.9	37.5	6.0	197.4	60.0
Queue Delay	0.0	8.9	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	42.2	56.0	25.4	4.9	127.9	37.5	6.0	197.4	60.0
Queue Length 50th (ft)	30	256	91	157	0	#164	190	0	#227	317
Queue Length 95th (ft)	64	333	#168	220	52	#312	286	44	#395	#485
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1124	230	1423	746	212	540	540	212	533
Starvation Cap Reductn	0	228	0	536	190	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.95	0.64	0.69	0.44	1.08	0.64	0.26	1.30	0.95

Intersection Summary
Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

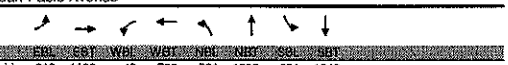
1021: 40th St & Emery St



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1159	166	977	336	301	193
v/c Ratio	0.18	0.94	0.75	0.68	0.87	0.58	0.72
Control Delay	39.9	48.8	49.6	20.3	48.4	9.2	45.1
Queue Delay	0.0	91.8	0.0	0.7	0.0	17.7	3.2
Total Delay	39.9	140.7	49.6	21.0	48.4	10.9	48.3
Queue Length 50th (ft)	18	969	103	134	205	17	116
Queue Length 95th (ft)	46	#666	m57	m273	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1232	301	1445	452	689	349
Starvation Cap Reductn	0	274	0	189	0	0	0
Spillback Cap Reductn	0	179	0	0	0	151	82
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.21	0.55	0.78	0.74	0.69	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1022: 40th St & San Pablo Avenue



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1108	49	709	521	1282	281	1343
v/c Ratio	0.92	1.10	0.51	1.05	1.17	0.98	1.09	1.00
Control Delay	49.1	81.2	59.6	81.7	137.1	52.7	123.6	55.1
Queue Delay	0.0	15.7	0.0	0.0	36.4	0.0	0.0	13.1
Total Delay	49.1	96.8	59.6	81.7	173.5	52.7	123.6	68.2
Queue Length 50th (ft)	112	~391	32	~248	~204	418	~210	~458
Queue Length 95th (ft)	m124	m#443	m66	#342	#308	#576	#370	#612
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1010	106	676	446	1307	256	1348
Starvation Cap Reductn	0	33	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	30	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.13	0.46	1.05	1.25	0.98	1.09	1.04

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	892	47	711	440	450
v/c Ratio	0.14	0.44	0.26	0.34	0.66	0.89
Control Delay	20.6	9.3	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	9.3	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	127	13	96	50	51
Queue Length 95th (ft)	m9	m140	36	103	88	#117
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	246	2115	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.19	0.34	0.64	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	565	513
v/c Ratio	0.76	0.45	0.59	0.12	0.76	0.56
Control Delay	25.7	18.2	27.2	11.4	24.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	167	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1616	1685
v/c Ratio	1.08	0.74	0.82	0.85
Control Delay	107.2	47.0	23.4	25.2
Queue Delay	0.0	0.0	2.9	0.0
Total Delay	107.2	47.0	26.2	25.2
Queue Length 50th (ft)	~197	129	445	482
Queue Length 95th (ft)	#306	180	566	613
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	595	1974	1974
Starvation Cap Reductn	0	0	250	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.94	0.85

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1109	1621
v/c Ratio	0.45	1.39	0.67	0.52
Control Delay	27.1	213.4	14.0	10.7
Queue Delay	0.3	0.0	33.2	0.4
Total Delay	27.4	213.4	47.3	11.1
Queue Length 50th (ft)	113	~549	196	175
Queue Length 95th (ft)	159	#772	268	212
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	553	1659	3103
Starvation Cap Reductn	0	0	612	0
Spillback Cap Reductn	158	0	0	792
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.39	1.06	0.70

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	851	1104	788	916
v/c Ratio	0.96	0.69	0.88	0.38
Control Delay	61.0	38.2	46.6	8.5
Queue Delay	27.8	54.2	145.2	5.1
Total Delay	88.7	92.4	191.8	13.6
Queue Length 50th (ft)	308	376	269	135
Queue Length 95th (ft)	#437	#503	341	171
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1927	897	2384
Starvation Cap Reductn	0	0	370	1385
Spillback Cap Reductn	92	336	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.11	1.42	0.92

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	138	64	245	172	837	90	645
v/c Ratio	0.41	0.12	0.63	0.90	0.98	0.28	0.61
Control Delay	22.7	14.6	30.3	11.5	44.6	7.4	10.5
Queue Delay	0.0	0.0	49.0	2.3	37.3	0.1	0.0
Total Delay	22.7	14.6	79.3	13.7	81.9	7.5	10.5
Queue Length 50th (ft)	41	14	83	28	261	12	122
Queue Length 95th (ft)	88	39	#175	68	#504	27	204
Internal Link Dist (ft)		493		63	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	340	539	391	570	852	317	1110
Starvation Cap Reductn	0	0	161	279	0	0	0
Spillback Cap Reductn	0	0	0	0	89	20	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.12	1.07	0.59	1.10	0.30	0.58

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	193	42	184	79
v/c Ratio	0.14	0.22	0.12	0.34
Control Delay	4.2	25.8	2.4	20.6
Queue Delay	0.8	0.0	0.0	0.0
Total Delay	5.1	25.8	2.4	20.6
Queue Length 50th (ft)	7	14	13	22
Queue Length 95th (ft)	m43	39	33	53
Internal Link Dist (ft)	83		854	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1385	236	1663	691
Starvation Cap Reductn	937	0	0	0
Spillback Cap Reductn	0	0	995	62
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.18	0.16	0.15

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	545	509	164	546	454	775
v/c Ratio	0.14	0.38	0.95	0.90	1.59	0.47	0.64	0.74
Control Delay	35.6	27.7	39.8	33.1	292.7	13.0	4.3	37.9
Queue Delay	0.0	4.0	84.3	60.5	0.0	1.2	5.6	0.5
Total Delay	35.6	32.5	124.1	93.6	292.7	14.3	9.9	38.5
Queue Length 50th (ft)	33	60	400	367	~168	53	32	266
Queue Length 95th (ft)	69	120	#625	#562	m#179	m56	m19	330
Internal Link Dist (ft)	185			342		236		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	389	586	586	103	1154	709	1054
Starvation Cap Reductn	0	0	90	89	0	382	194	0
Spillback Cap Reductn	15	177	138	136	0	0	38	66
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.70	1.19	1.13	1.59	0.71	0.88	0.78

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St — 2010 Plus Alt#3 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	410	78	712	1034	330	359
v/c Ratio	0.91	0.09	0.85	0.83	0.46	0.33
Control Delay	32.3	1.0	22.5	30.8	30.1	7.3
Queue Delay	6.4	0.0	0.2	6.1	0.0	0.0
Total Delay	38.7	1.0	22.7	39.0	30.1	7.3
Queue Length 50th (ft)	265	4	228	784	190	73
Queue Length 95th (ft)	#432	m6	m227	m851	295	146
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1036	1186	1263	721	1137
Starvation Cap Reductn	55	0	0	191	0	0
Spillback Cap Reductn	0	0	80	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.08	0.64	0.97	0.46	0.32

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd — 2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	572	555	45	333	1412	147	520
v/c Ratio	0.22	0.17	0.06	0.99	0.90	0.31	0.34	0.89	0.63	0.79
Control Delay	35.8	35.6	20.7	50.9	46.2	35.6	23.6	9.3	32.9	30.2
Queue Delay	0.0	0.0	0.0	25.8	17.9	0.0	0.0	0.0	0.0	7.4
Total Delay	35.8	35.6	20.7	76.7	64.1	35.6	23.6	9.3	32.9	37.6
Queue Length 50th (ft)	13	11	0	~332	~312	21	67	0	60	291
Queue Length 95th (ft)	39	34	13	#574	#558	54	116	#59	126	#439
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	329	346	301	615	616	313	1108	1583	441	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	51	69	69	0	0	0	0	159
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	1.05	1.01	0.14	0.30	0.59	0.33	0.63

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd — 2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	917	1151	1338	263
v/c Ratio	0.89	0.17	0.79	0.82	0.92	0.33
Control Delay	51.4	16.1	25.4	21.7	35.1	6.0
Queue Delay	0.0	0.0	30.7	0.0	99.9	0.0
Total Delay	51.4	16.1	56.2	21.7	129.1	6.0
Queue Length 50th (ft)	85	61	309	632	438	25
Queue Length 95th (ft)	141	93	m320	m708	513	73
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340				190	
Base Capacity (vph)	290	1776	1260	1399	1592	841
Starvation Cap Reductn	0	0	387	0	358	0
Spillback Cap Reductn	0	0	0	0	483	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.17	1.05	0.82	1.21	0.31

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp — 2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1522	1649	463	420	734	712
v/c Ratio	0.79	1.27	0.99	0.56	0.57	0.93	1.83
Control Delay	67.6	150.2	47.7	4.8	27.1	37.1	403.1
Queue Delay	0.0	114.3	51.9	0.2	0.7	2.0	17.2
Total Delay	67.6	264.4	99.6	5.0	27.8	39.1	420.2
Queue Length 50th (ft)	73	~490	~431	18	229	362	~830
Queue Length 95th (ft)	m98	#614	#616	m39	336	#667	#1225
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275				400	625	
Base Capacity (vph)	209	1197	1674	822	734	793	390
Starvation Cap Reductn	0	200	98	55	0	0	0
Spillback Cap Reductn	0	66	213	0	103	18	6
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.53	1.13	0.60	0.67	0.95	1.86

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	760	1451	734	380	726	321	153	161	110	607	1132
v/c Ratio	1.26	1.31	1.21	1.30	0.68	0.59	0.84	0.86	0.42	1.23	0.87
Control Delay	172.8	170.8	117.4	231.4	37.8	24.4	91.5	93.8	26.5	146.5	23.8
Queue Delay	0.0	16.2	2.6	0.0	0.8	0.0	0.0	0.0	0.0	122.6	47.5
Total Delay	172.8	186.0	120.0	231.4	38.6	24.4	91.5	93.8	26.5	269.1	71.3
Queue Length 50th (ft)	~450	~667	~506	~359	237	116	121	127	25	~520	252
Queue Length 95th (ft)	m#232	m#430	m196	#545	304	211	m#235	m#249	m69	m#688	m412
Internal Link Dist (ft)		966			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1106	606	274	1062	545	183	188	261	495	1300
Starvation Cap Reductn	0	28	3	0	0	0	0	0	0	91	271
Spillback Cap Reductn	0	0	0	0	115	0	0	0	0	0	184
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	1.35	1.22	1.39	0.77	0.59	0.84	0.86	0.42	1.50	1.10

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1732	411
v/c Ratio	0.21	0.22	0.88	0.93	0.48
Control Delay	23.4	23.0	31.8	21.4	12.9
Queue Delay	1.2	0.7	5.6	1.8	0.0
Total Delay	24.6	23.7	37.5	23.2	12.9
Queue Length 50th (ft)	76	62	336	527	234
Queue Length 95th (ft)	127	114	#540	#772	308
Internal Link Dist (ft)		150		620	739
Turn Bay Length (ft)	200				
Base Capacity (vph)	844	1348	1411	1863	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	170	355	0	54	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.96	0.48

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street
2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	1040	41	846	307	262	39	250	103
v/c Ratio	0.82	0.91	0.38	0.94	0.78	0.63	0.11	0.66	0.26
Control Delay	84.6	36.8	41.4	45.2	34.2	27.7	21.3	28.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.6	36.8	41.4	45.2	34.2	27.7	21.3	28.7	6.7
Queue Length 50th (ft)	38	~237	16	177	113	90	13	92	0
Queue Length 95th (ft)	#120	#368	#46	#311	#228	166	35	160	34
Internal Link Dist (ft)		922		1493		3824		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	113	1138	107	900	437	457	428	450	453
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.91	0.38	0.94	0.70	0.57	0.09	0.56	0.23

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street
2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1308	190	1247	226	237	60
v/c Ratio	0.32	0.81	1.19	0.62	0.76	0.52	0.24
Control Delay	62.3	23.0	137.2	15.7	43.0	6.8	27.9
Queue Delay	0.0	54.6	0.0	5.9	0.0	0.1	0.0
Total Delay	62.3	77.6	137.2	21.6	43.0	6.9	27.9
Queue Length 50th (ft)	13	92	~144	66	140	0	28
Queue Length 95th (ft)	m24	#735	m#152	m#470	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1621	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	695	0	0	0
Spillback Cap Reductn	0	448	0	0	0	90	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.12	1.19	0.95	0.51	0.45	0.14

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue — 2010 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1174	78	699	622	1015	160	1217
v/c Ratio	0.81	1.06	0.76	0.84	1.13	0.93	0.78	1.16
Control Delay	62.5	55.2	84.2	45.8	119.9	36.3	57.0	114.3
Queue Delay	0.0	22.7	0.0	6.2	76.6	0.0	0.0	0.5
Total Delay	62.5	77.9	84.2	52.0	196.5	36.3	57.0	114.8
Queue Length 50th (ft)	88	~427	50	221	~238	312	99	~481
Queue Length 95th (ft)	m162	#527	#128	#323	#348	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1112	106	893	549	1249	239	1051
Starvation Cap Reductn	0	56	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	74	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.11	0.74	0.96	1.31	0.82	0.67	1.16

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

5:00 pm Baseline
Fehr & Peers Associates, Inc.

Synchro 6 Report
Page 12

SYNCHRO QUEUE SHEETS
ALTERNATIVE #3
2030

Queues
1001: Ashby (SR 13) & Seventh St — Marketplace Redevelopment, 2030 Plus Alt#3 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1319	124	881	127	354	72	287	214
v/c Ratio	1.08	0.89	0.70	1.05	0.56	0.76	0.24	0.91	0.48
Control Delay	97.5	31.4	48.4	81.3	51.4	50.0	41.7	74.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	31.4	48.4	81.3	51.4	50.0	41.7	74.5	9.3
Queue Length 50th (ft)	~479	417	84	~381	84	118	44	200	0
Queue Length 95th (ft)	#697	#534	m89	m#445	146	169	88	#354	65
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1580	199	836	257	620	306	922	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.83	0.64	1.05	0.49	0.68	0.24	0.89	0.48

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1/29/2007
Fehr & Peers Associates, Inc.

Synchro 6 Report
Page 1

Queues
1002: Ashby (SR 13) & San Pablo Avenue — Marketplace Redevelopment, 2030 Plus Alt#3 AM

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	898	229	946	125	1099	
v/c Ratio	0.83	0.64	0.96	0.91	0.84	0.49	0.97	
Control Delay	36.7	11.0	46.9	81.2	42.6	50.4	57.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	36.7	11.0	46.9	81.2	42.6	50.4	57.1	
Queue Length 50th (ft)	19	65	301	161	327	82	~414	
Queue Length 95th (ft)	m28	97	#444	#302	#438	143	#562	
Internal Link Dist (ft)		1299	1505		696		1488	
Turn Bay Length (ft)	125			165		120		
Base Capacity (vph)	161	1521	962	257	1129	257	1136	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.80	0.62	0.93	0.89	0.84	0.49	0.97	

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1/29/2007
Fehr & Peers Associates, Inc.

Synchro 6 Report
Page 2

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	60	69	100	283	240	126	522
v/c Ratio	0.18	0.07	0.15	0.30	0.62	0.29	0.76
Control Delay	12.4	10.1	6.6	1.2	18.7	12.5	15.7
Queue Delay	0.0	0.0	0.4	0.5	0.0	0.0	0.0
Total Delay	12.4	10.1	7.0	1.6	18.7	12.5	15.7
Queue Length 50th (ft)	16	12	10	0	62	29	196
Queue Length 95th (ft)	47	36	27	6	114	49	196
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	445	922	662	932	594	452	969
Starvation Cap Reductn	0	0	298	315	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.07	0.27	0.46	0.40	0.28	0.83

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	282	53	205	193
v/c Ratio	0.20	0.07	0.16	0.69
Control Delay	3.9	4.1	3.9	22.2
Queue Delay	0.4	0.0	0.0	0.1
Total Delay	4.3	4.1	3.9	22.2
Queue Length 50th (ft)	22	5	19	63
Queue Length 95th (ft)	68	17	49	109
Internal Link Dist (ft)	114		869	743
Turn Bay Length (ft)				
Base Capacity (vph)	1380	736	1585	794
Starvation Cap Reductn	678	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.07	0.15	0.25

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	127	38	371	24	666
v/c Ratio	0.85	0.44	0.19	0.33	0.14	0.65
Control Delay	40.7	22.6	18.7	8.1	20.9	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	22.6	18.7	8.1	20.9	15.0
Queue Length 50th (ft)	69	32	11	35	7	83
Queue Length 95th (ft)	#191	73	27	157	23	#344
Internal Link Dist (ft)	683	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	371	291	283	1109	283	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.44	0.13	0.33	0.08	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	299	223	63	234	127	463
v/c Ratio	0.65	0.59	0.90	0.83	0.11	0.10	0.12	0.21
Control Delay	72.9	20.3	93.9	83.5	0.7	0.6	0.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	20.3	93.9	83.5	0.7	0.6	0.2	6.9
Queue Length 50th (ft)	45	0	188	151	1	1	0	64
Queue Length 95th (ft)	#112	56	#312	#277	1	1	0	75
Internal Link Dist (ft)	75			995		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	568	2340	1093	2202
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.89	0.82	0.11	0.10	0.12	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	87	40	300	224	162	213
v/c Ratio	0.52	0.09	0.61	0.15	0.14	0.64
Control Delay	37.4	19.4	40.0	0.4	8.8	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	19.4	40.0	0.4	8.8	9.8
Queue Length 50th (ft)	50	4	79	2	95	5
Queue Length 95th (ft)	m91	m26	84	4	79	71
Internal Link Dist (ft)	335			739	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	902	1236	1539	1199	494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.05	0.24	0.15	0.14	0.43

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	409	432	93	116	1015	80	354
v/c Ratio	0.03	0.14	0.12	0.61	0.63	0.45	0.12	0.64	0.41	0.71
Control Delay	35.8	36.2	18.2	25.8	26.4	33.5	19.6	2.0	33.1	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.8	26.4	33.5	19.6	2.0	33.1	24.3
Queue Length 50th (ft)	2	10	0	163	174	40	20	0	34	139
Queue Length 95th (ft)	14	35	20	#384	#412	93	42	0	83	250
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	383	403	355	719	728	371	1292	1583	480	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.57	0.59	0.25	0.09	0.64	0.17	0.48

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	810	1183	888	151
v/c Ratio	0.38	0.22	0.62	0.82	0.86	0.26
Control Delay	39.1	5.1	17.7	16.6	34.9	4.5
Queue Delay	0.0	0.0	1.2	0.0	0.1	0.0
Total Delay	39.1	5.1	18.9	16.6	35.0	4.5
Queue Length 50th (ft)	71	32	109	656	272	0
Queue Length 95th (ft)	126	63	m182	m746	315	40
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2122	1315	1441	1578	724
Starvation Cap Reductn	0	0	285	0	0	0
Spillback Cap Reductn	0	1	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.79	0.82	0.66	0.21

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1049	1314	423	604	705	692
v/c Ratio	0.27	0.44	0.89	0.53	0.95	1.12	0.98
Control Delay	27.3	9.1	23.6	2.7	55.8	98.8	55.4
Queue Delay	0.0	2.2	1.7	0.2	0.0	34.8	44.7
Total Delay	27.3	11.3	25.5	2.9	55.8	133.6	100.1
Queue Length 50th (ft)	21	158	179	11	366	~515	417
Queue Length 95th (ft)	m49	143	m#291	m14	#621	#762	#689
Internal Link Dist (ft)		238	985			1448	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	794	639	631	707
Starvation Cap Reductn	0	1154	0	44	0	0	0
Spillback Cap Reductn	0	68	68	0	0	43	86
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.93	0.56	0.95	1.20	1.11

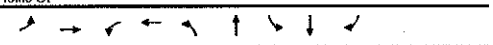
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	315	1601	334	75	843	99	22	23	42	231	771
v/c Ratio	0.46	1.14	0.37	0.59	0.88	0.22	0.19	0.20	0.28	0.43	0.51
Control Delay	41.3	89.9	1.7	58.4	47.2	23.0	44.1	44.3	15.5	38.6	6.0
Queue Delay	0.0	8.6	0.2	0.0	2.6	0.0	0.0	0.0	0.0	1.5	0.0
Total Delay	41.3	98.5	1.9	58.4	49.7	23.0	44.1	44.3	15.5	40.1	6.1
Queue Length 50th (ft)	92	~652	8	47	271	37	14	14	0	120	66
Queue Length 95th (ft)	m117	m#759	m14	#95	#378	79	38	40	32	m165	m90
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	690	1407	899	142	956	445	185	186	212	537	1510
Starvation Cap Reductn	0	24	125	0	0	0	0	0	0	161	26
Spillback Cap Reductn	0	0	0	0	48	0	0	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	1.16	0.44	0.53	0.93	0.22	0.12	0.12	0.20	0.61	0.52

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

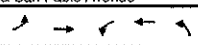
Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	543	205
v/c Ratio	0.07	0.07	0.20	0.24	0.20
Control Delay	27.1	26.5	3.1	7.7	11.1
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.1	26.5	3.8	7.7	11.1
Queue Length 50th (ft)	16	14	0	68	61
Queue Length 95th (ft)	38	31	25	93	87
Internal Link Dist (ft)		119		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2279	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.24	0.20

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	843	38	621	309	313	32	306	115
v/c Ratio	1.11	0.58	0.29	0.77	0.86	0.83	0.09	0.86	0.29
Control Delay	119.6	23.4	46.7	42.5	51.6	48.9	24.7	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.6	23.4	46.7	42.5	51.6	48.9	24.7	45.3	10.2
Queue Length 50th (ft)	~363	211	23	192	197	196	12	159	0
Queue Length 95th (ft)	#556	286	55	256	#318	#309	m26	#305	44
Internal Link Dist (ft)		159		1493		357		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	383	1444	159	810	407	426	372	361	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.58	0.24	0.77	0.76	0.73	0.09	0.78	0.27

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	466	111	552	132	808	52	1042
v/c Ratio	0.67	0.69	0.64	0.79	0.65	0.46	0.41	0.68
Control Delay	99.9	35.1	52.0	37.5	46.2	19.0	45.9	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	35.1	52.0	37.5	46.2	19.0	45.9	26.8
Queue Length 50th (ft)	70	131	69	179	82	170	32	264
Queue Length 95th (ft)	#171	173	124	211	136	272	69	#458
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	890	212	1058	301	1753	230	1543
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.52	0.52	0.52	0.44	0.46	0.23	0.68

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	407	87	432	341	95	440	261
v/c Ratio	0.25	0.35	0.56	0.31	0.41	0.21	0.93	0.79
Control Delay	48.4	26.4	58.3	24.6	5.1	29.9	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.4	58.3	24.6	5.5	29.9	56.0	41.8
Queue Length 50th (ft)	16	97	53	91	0	47	206	160
Queue Length 95th (ft)	43	155	#126	177	71	89	#442	222
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1176	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.35	0.56	0.31	0.51	0.20	0.88	0.69

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	447	60	611	222	143	343	42	165	277
v/c Ratio	0.27	0.29	0.44	0.48	0.25	0.69	0.73	0.10	1.30	0.70
Control Delay	46.8	20.0	49.6	21.7	4.1	49.5	35.8	7.3	214.1	32.9
Queue Delay	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	20.0	49.6	23.3	4.5	49.5	35.8	7.3	214.1	32.9
Queue Length 50th (ft)	18	80	47	186	0	89	203	0	~157	125
Queue Length 95th (ft)	46	156	76	302	50	149	262	23	#294	181
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	169	1565	165	1707	878	266	671	597	142	539
Starvation Cap Reductn	0	0	0	670	309	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.29	0.36	0.78	0.39	0.54	0.51	0.07	1.30	0.51

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	627	128	916	444	127	58
v/c Ratio	0.04	0.46	0.68	0.49	0.94	0.27	0.39
Control Delay	47.3	25.1	49.6	11.1	60.4	12.3	39.1
Queue Delay	0.0	0.7	0.0	0.8	0.0	0.0	0.0
Total Delay	47.3	25.9	49.6	11.7	60.4	12.3	39.1
Queue Length 50th (ft)	2	152	58	31	274	19	33
Queue Length 95th (ft)	11	243	m107	m283	#457	64	65
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1392	208	1857	480	491	295
Starvation Cap Reductn	0	435	0	524	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.66	0.62	0.69	0.91	0.26	0.20

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	575	34	841	369	1020	175	1136
v/c Ratio	0.63	0.54	0.23	0.86	0.77	0.79	0.78	0.92
Control Delay	69.1	35.1	49.0	45.5	53.2	34.9	49.7	44.3
Queue Delay	0.0	0.1	0.0	0.1	2.3	0.0	0.0	0.1
Total Delay	69.1	35.2	49.0	45.5	55.5	34.9	49.7	44.4
Queue Length 50th (ft)	70	55	19	210	118	303	109	360
Queue Length 95th (ft)	126	240	m51	#421	#180	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1169	160	974	481	1286	301	1233
Starvation Cap Reductn	0	60	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	3	41	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.52	0.21	0.87	0.84	0.79	0.58	0.92

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	513	117	829	240	409
v/c Ratio	0.31	0.29	0.59	0.41	0.40	0.75
Control Delay	18.7	9.1	32.8	7.7	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	9.1	32.8	7.7	16.0	26.3
Queue Length 50th (ft)	26	61	33	42	25	52
Queue Length 95th (ft)	m40	m115	#86	127	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.29	0.55	0.41	0.39	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	463	63	183	5	317	
v/c Ratio	0.65	0.06	0.44	0.01	0.55	
Control Delay	10.8	4.4	10.2	10.8	5.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.8	4.4	10.2	10.8	5.4	
Queue Length 50th (ft)	39	4	18	1	10	
Queue Length 95th (ft)	#138	19	65	6	59	
Internal Link Dist (ft)		1606	582	425	393	
Turn Bay Length (ft)	105					
Base Capacity (vph)	728	1192	646	732	854	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.64	0.05	0.28	0.01	0.37	

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.36	0.72	0.07	0.77	0.33
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	543	555	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	SBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1357	1303
v/c Ratio	0.63	0.77	0.68	0.64
Control Delay	60.2	47.9	17.2	16.6
Queue Delay	0.0	0.0	0.6	0.0
Total Delay	60.2	47.9	17.8	16.6
Queue Length 50th (ft)	101	147	316	295
Queue Length 95th (ft)	#170	202	398	374
Internal Link Dist (ft)		2	922	3	798
Turn Bay Length (ft)					
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	321	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.78	0.64

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	672	1253
v/c Ratio	0.58	1.18	0.88	0.45
Control Delay	27.5	116.6	13.5	14.1
Queue Delay	0.1	0.0	3.3	0.0
Total Delay	27.6	116.6	16.8	14.1
Queue Length 50th (ft)	201	~561	120	185
Queue Length 95th (ft)	262	#797	160	199
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1504	729	1789	2792
Starvation Cap Reductn	0	0	993	0
Spillback Cap Reductn	38	0	0	205
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	1.18	0.84	0.48

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	531	710	560	715
v/c Ratio	0.71	0.47	0.88	0.80
Control Delay	25.2	15.8	45.2	5.4
Queue Delay	0.0	0.1	0.0	0.7
Total Delay	25.2	15.8	45.2	6.1
Queue Length 50th (ft)	108	107	122	54
Queue Length 95th (ft)	146	171	#206	96
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	636	2392
Starvation Cap Reductn	0	0	0	1247
Spillback Cap Reductn	47	76	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.49	0.88	0.62

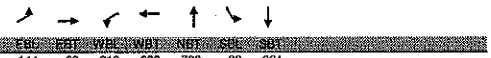
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1056	156	1031	213	685	159	407	533
v/c Ratio	0.92	0.85	0.76	1.05	0.66	1.08	0.45	1.09	0.87
Control Delay	71.3	39.9	57.2	61.7	50.6	91.4	43.4	115.4	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	39.9	57.2	61.7	50.6	91.4	43.4	115.4	29.6
Queue Length 50th (ft)	219	355	108	~428	149	~274	99	~325	119
Queue Length 95th (ft)	#380	#459	m92	m310	m189	m#358	166	#517	#321
Internal Link Dist (ft)		1600		1209		973		1045	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	364	1242	225	981	322	645	354	373	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.85	0.69	1.05	0.66	1.06	0.45	1.09	0.87

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

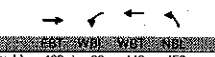
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	1010	294	1474	201	1411
v/c Ratio	1.70	0.67	1.16	1.07	1.32	0.83	1.34
Control Delay	363.6	26.4	112.7	120.0	183.0	74.7	193.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	363.6	26.4	112.7	120.0	183.0	74.7	193.0
Queue Length 50th (ft)	~226	344	~441	~232	~711	140	~686
Queue Length 95th (ft)	m#290	m399	#573	#402	#852	#266	#826
Internal Link Dist (ft)		1209	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	125	1518	874	274	1116	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.70	0.67	1.16	1.07	1.32	0.83	1.34

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



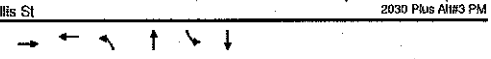
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	144	89	219	639	730	98	664
v/c Ratio	1.07	0.13	0.45	0.76	1.01	0.36	0.73
Control Delay	129.7	13.5	17.2	13.9	57.5	11.2	15.5
Queue Delay	0.0	0.0	1.8	0.6	1.6	0.7	0.0
Total Delay	129.7	13.5	19.0	17.4	59.1	12.0	15.5
Queue Length 50th (ft)	~64	20	49	45	~247	16	186
Queue Length 95th (ft)	#160	47	104	#255	#464	36	265
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	134	686	482	840	720	269	962
Starvation Cap Reductn	0	0	139	123	0	0	0
Spillback Cap Reductn	0	10	0	0	4	46	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.13	0.64	0.89	1.02	0.44	0.69

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



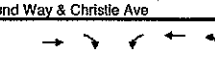
Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	463	39	449	453
v/c Ratio	0.45	0.12	0.49	0.82
Control Delay	8.6	9.9	11.0	20.4
Queue Delay	1.5	0.0	0.0	0.3
Total Delay	10.1	9.9	11.1	20.7
Queue Length 50th (ft)	65	6	84	146
Queue Length 95th (ft)	m84	26	195	195
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1033	336	1036	821
Starvation Cap Reductn	377	0	0	0
Spillback Cap Reductn	0	0	42	65
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.12	0.45	0.80

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	527	202	172	795	20	644
v/c Ratio	1.27	0.43	0.78	0.82	0.12	0.96
Control Delay	161.0	18.3	44.8	22.9	22.8	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.0	18.3	44.8	22.9	22.8	42.2
Queue Length 50th (ft)	~225	50	56	229	8	174
Queue Length 95th (ft)	#389	100	m#128	#523	m14	m#314
Internal Link Dist (ft)	883	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	416	472	225	972	225	673
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.43	0.76	0.82	0.09	0.96

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	412	390	137	413	231	680
v/c Ratio	0.17	0.54	0.55	0.52	0.70	0.50	0.33	0.54
Control Delay	50.6	16.8	8.3	7.4	47.4	21.5	5.2	27.8
Queue Delay	0.0	0.6	1.2	1.0	0.0	0.4	0.5	0.0
Total Delay	50.6	17.5	9.5	8.4	47.4	21.9	5.6	27.8
Queue Length 50th (ft)	12	0	75	64	48	60	19	190
Queue Length 95th (ft)	35	52	131	114	m86	m85	m37	248
Internal Link Dist (ft)	128			935		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	219	755	748	196	1358	699	1261
Starvation Cap Reductn	0	0	94	93	0	510	180	0
Spillback Cap Reductn	0	19	161	158	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.50	0.69	0.66	0.70	0.49	0.45	0.54

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	216	36	499	731	319	303
v/c Ratio	0.76	0.05	0.85	0.51	0.34	0.80
Control Delay	30.4	0.7	39.4	2.1	20.5	26.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	30.4	0.7	39.4	2.3	20.5	26.8
Queue Length 50th (ft)	87	0	107	6	136	110
Queue Length 95th (ft)	189	m1	118	17	253	194
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	858	1156	1426	939	523
Starvation Cap Reductn	0	0	0	176	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.04	0.43	0.58	0.34	0.58

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	389	63	311	325	12	767	1545	283	678
v/c Ratio	0.60	1.22	0.22	0.82	0.85	0.13	0.91	0.98	0.86	0.82
Control Delay	46.8	158.6	28.6	44.0	45.5	47.5	48.5	20.3	49.5	33.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	158.6	28.6	44.0	45.5	47.5	48.5	20.3	49.5	33.7
Queue Length 50th (ft)	107	~318	23	189	200	7	248	0	169	338
Queue Length 95th (ft)	#193	#506	62	#315	#336	26	#374	#210	#294	#666
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	304	320	289	441	443	259	871	1583	385	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.22	0.22	0.71	0.73	0.05	0.88	0.98	0.74	0.82

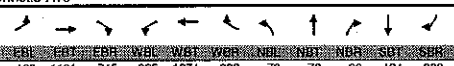
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1385	1283	997	361
v/c Ratio	0.46	0.49	1.04dr	0.92	0.92	0.51
Control Delay	45.6	5.9	28.2	21.1	47.0	8.9
Queue Delay	0.0	0.0	206.1	0.0	2.8	0.0
Total Delay	45.6	5.9	234.3	21.1	49.8	8.9
Queue Length 50th (ft)	95	87	~492	746	342	33
Queue Length 95th (ft)	160	134	m391	m636	#458	113
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	422	2199	1375	1399	1124	716
Starvation Cap Reductn	0	0	444	0	0	0
Spillback Cap Reductn	0	10	0	0	62	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.50	1.49	0.92	0.94	0.50

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1221	1932	470	603	818	592
v/c Ratio	0.45	0.62	1.15	0.61	1.07	1.38	1.71
Control Delay	64.2	14.5	99.8	6.2	93.2	207.1	355.2
Queue Delay	0.0	17.5	175.6	0.4	30.8	40.9	89.3
Total Delay	64.2	32.0	275.4	6.6	124.0	248.0	444.6
Queue Length 50th (ft)	111	84	~627	37	~496	~779	~1044
Queue Length 95th (ft)	m142	m101	m#577	m35	#726	#1042	#1015
Internal Link Dist (ft)		236	385			1446	
Turn Bay Length (ft)	275				400	625	
Base Capacity (vph)	338	1480	1687	768	565	594	346
Starvation Cap Reductn	0	181	199	56	0	0	0
Spillback Cap Reductn	0	290	491	0	38	37	96
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.02	1.54	0.86	1.14	1.47	1.91

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

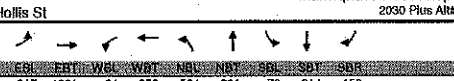


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	469	1191	745	325	1274	283	72	78	66	424	888
v/c Ratio	0.88	1.17	1.05	1.19	1.20	0.56	0.34	0.35	0.25	0.86	0.73
Control Delay	57.2	114.2	48.8	151.2	134.1	35.3	49.6	49.9	25.2	54.8	12.2
Queue Delay	0.0	25.0	7.3	0.0	256.3	0.0	0.0	0.0	0.0	41.9	0.4
Total Delay	57.2	139.1	56.2	151.2	390.4	35.3	49.6	49.9	25.2	96.8	12.5
Queue Length 50th (ft)	177	~845	~281	~272	~564	167	67	61	19	300	139
Queue Length 95th (ft)	m167	m#456	m246	#470	#733	271	110	113	65	#463	159
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	505	214	217	259	493	1215
Starvation Cap Reductn	0	47	13	0	0	0	0	0	0	99	47
Spillback Cap Reductn	0	0	0	0	343	0	0	0	0	0	55
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.23	1.07	1.19	1.77	0.56	0.34	0.35	0.25	1.08	0.77

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	95	199	829	1245	348
v/c Ratio	0.17	0.17	0.45	0.60	0.57
Control Delay	32.3	31.0	9.2	16.0	44.5
Queue Delay	2.3	1.3	0.0	0.0	0.0
Total Delay	34.5	32.3	9.8	16.0	44.5
Queue Length 50th (ft)	82	85	93	277	267
Queue Length 95th (ft)	118	104	149	342	357
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1842	2069	610
Starvation Cap Reductn	351	750	574	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.60	0.65	0.60	0.57

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1201	24	859	594	661	73	314	158
v/c Ratio	1.35	1.23	0.25	1.17	0.85	1.01	0.20	0.83	0.38
Control Delay	232.2	146.7	56.4	130.5	63.4	75.6	43.4	53.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	18.9	40.9	0.0	0.0	0.0
Total Delay	232.2	146.7	56.4	130.5	82.3	116.5	43.4	53.4	14.2
Queue Length 50th (ft)	207	~566	17	~381	418	~509	49	216	16
Queue Length 95th (ft)	m#353	m#701	45	#510	#727	#817	m88	301	79
Internal Link Dist (ft)		159		1493		367		560	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	975	97	733	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	50	65	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.23	0.25	1.17	1.03	1.12	0.15	0.60	0.29

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	971	112	622	195	1592	118	1460
v/c Ratio	0.97	0.90	0.65	0.70	0.82	1.26	0.67	1.28
Control Delay	99.3	52.0	50.5	32.7	58.0	152.5	52.2	163.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	52.0	50.5	32.7	58.0	152.5	52.2	163.0
Queue Length 50th (ft)	110	260	61	159	108	~649	65	~601
Queue Length 95th (ft)	#243	#420	#118	217	#213	#786	#131	#737
Internal Link Dist (ft)		207		2595		1367		641
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1013	197	976	266	1262	197	1130
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.96	0.57	0.64	0.76	1.26	0.60	1.28

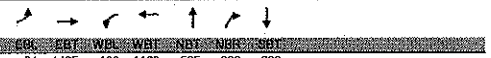
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	995	166	804	113	280	540	711
v/c Ratio	0.31	1.29	1.34	0.82	0.23	0.59	1.10	1.45
Control Delay	50.1	146.4	234.7	44.0	7.4	37.5	106.5	241.8
Queue Delay	0.0	68.1	24.8	2.5	0.0	0.0	0.0	1.3
Total Delay	50.1	214.5	259.2	46.5	7.4	37.5	106.5	243.1
Queue Length 50th (ft)	21	~405	~139	267	0	155	~369	~686
Queue Length 95th (ft)	51	#534	#270	#399	43	241	#590	#852
Internal Link Dist (ft)		248		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	811	124	975	500	478	489	492
Starvation Cap Reductn	0	90	0	84	0	0	0	0
Spillback Cap Reductn	0	17	5	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.36	1.39	0.90	0.23	0.59	1.10	1.45

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1121	151	836	274	234	413	140	344	667
v/c Ratio	0.39	1.02	0.74	0.60	0.36	1.10	0.76	0.26	1.62	1.25
Control Delay	46.8	66.6	58.8	27.4	4.5	134.7	43.2	6.0	321.0	150.3
Queue Delay	0.0	97.5	0.0	5.4	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	164.1	56.8	32.7	5.0	134.7	43.2	6.0	321.0	150.3
Queue Length 50th (ft)	30	~418	93	232	0	~171	240	0	~324	~537
Queue Length 95th (ft)	64	#548	#173	314	55	#321	#377	44	m#382	m#585
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1101	230	1400	756	212	540	540	212	535
Starvation Cap Reductn	0	207	0	492	185	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.25	0.66	0.92	0.48	1.10	0.76	0.26	1.62	1.25

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1495	166	1169	535	302	209
v/c Ratio	0.19	1.35	0.78	0.90	1.18	0.69	0.76
Control Delay	40.1	192.3	50.4	25.0	136.2	19.4	46.7
Queue Delay	0.0	133.1	0.0	11.1	0.0	4.0	4.8
Total Delay	40.1	325.4	50.4	36.1	136.2	23.4	51.4
Queue Length 50th (ft)	19	~652	95	~427	~411	71	126
Queue Length 95th (ft)	48	#912	m51	m#285	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			190	
Base Capacity (vph)	249	1109	301	1305	454	515	349
Starvation Cap Reductn	0	200	0	136	0	0	0
Spillback Cap Reductn	0	83	0	0	0	138	83
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.64	0.55	1.09	1.18	0.80	0.79

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1369	49	837	577	1431	298	1634
v/c Ratio	0.95	1.34	0.51	1.24	1.29	1.09	1.20	1.23
Control Delay	38.2	183.3	57.1	153.4	184.7	86.3	159.0	138.0
Queue Delay	2.1	21.4	0.0	6.6	0.0	1.8	0.0	21.3
Total Delay	40.4	204.7	57.1	160.0	184.7	88.1	159.0	159.3
Queue Length 50th (ft)	123	~577	32	~344	~243	~547	~232	~682
Queue Length 95th (ft)	m76	m#395	m65	m#446	#350	#685	#398	#823
Internal Link Dist (ft)		273		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1019	106	674	446	1307	249	1333
Starvation Cap Reductn	0	35	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.39	0.46	1.26	1.29	1.10	1.20	1.27

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1067	47	817	440	485
v/c Ratio	0.25	0.54	0.26	0.42	0.66	0.86
Control Delay	20.6	11.5	22.0	9.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	11.5	22.0	9.2	19.6	29.7
Queue Length 50th (ft)	22	185	19	44	50	52
Queue Length 95th (ft)	m17	m152	36	131	89	#125
Internal Link Dist (ft)		410		1102	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1987	248	1955	690	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.54	0.19	0.42	0.64	0.83

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	597	112	349	160	807
v/c Ratio	1.16	0.13	1.09	0.21	1.04
Control Delay	114.8	13.6	110.1	12.2	64.8
Queue Delay	0.0	0.0	0.0	0.0	16.6
Total Delay	114.8	13.6	110.1	12.2	81.6
Queue Length 50th (ft)	~335	33	~209	40	~443
Queue Length 95th (ft)	#540	64	#380	79	#670
Internal Link Dist (ft)		1606	582	426	399
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	750	775
Starvation Cap Reductn	0	0	0	0	32
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.16	0.13	1.09	0.21	1.09

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.03	0.73
Control Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.8	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	393	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1811	2029
v/c Ratio	1.11	0.74	0.92	1.03
Control Delay	117.3	47.0	30.1	51.8
Queue Delay	0.0	0.0	18.5	0.0
Total Delay	117.3	47.0	48.6	51.8
Queue Length 50th (ft)	~206	130	556	~780
Queue Length 95th (ft)	#315	180	#771	#935
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	596	1976	1974
Starvation Cap Reductn	0	0	222	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.86	1.03	1.03

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1229	1955
v/c Ratio	0.62	1.58	0.79	0.63
Control Delay	30.2	295.5	18.0	12.2
Queue Delay	1.0	0.0	65.6	2.4
Total Delay	31.3	295.5	83.5	14.6
Queue Length 50th (ft)	168	~963	252	294
Queue Length 95th (ft)	227	#891	349	280
Internal Link Dist (ft)	685		192	598
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	534	1555	3103
Starvation Cap Reductn	0	0	477	0
Spillback Cap Reductn	186	0	0	977
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	1.58	1.14	0.92

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1224	976	1062
v/c Ratio	1.14	0.98	1.01	0.45
Control Delay	113.0	57.0	71.1	9.1
Queue Delay	85.0	163.6	246.3	11.7
Total Delay	198.0	220.5	319.4	20.9
Queue Length 50th (ft)	~441	444	~360	160
Queue Length 95th (ft)	#573	#601	#500	207
Internal Link Dist (ft)	399	1679		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1303
Spillback Cap Reductn	130	361	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.33	1.39	1.59	0.99

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

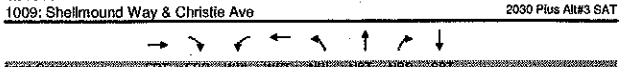
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	143	64	245	351	799	98	956
v/c Ratio	0.80	0.12	0.62	0.51	0.95	0.30	0.91
Control Delay	57.9	14.6	29.8	5.8	36.5	7.6	21.5
Queue Delay	0.0	0.0	5.8	0.8	13.1	0.1	0.0
Total Delay	57.9	14.6	29.6	6.5	49.7	7.7	21.5
Queue Length 50th (ft)	50	14	54	0	237	13	245
Queue Length 95th (ft)	#145	39	#162	39	#470	29	#515
Internal Link Dist (ft)		493		63	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	179	546	398	685	848	326	1109
Starvation Cap Reductn	0	0	102	126	0	0	0
Spillback Cap Reductn	0	0	0	0	60	14	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.12	0.83	0.63	1.01	0.31	0.86

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	200	47	184	262
v/c Ratio	0.19	0.23	0.15	0.66
Control Delay	5.6	25.2	5.5	22.4
Queue Delay	2.1	0.0	0.0	0.1
Total Delay	7.8	25.2	5.6	22.5
Queue Length 50th (ft)	10	16	22	85
Queue Length 95th (ft)	m34	41	56	133
Internal Link Dist (ft)	65		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1030	266	1199	592
Starvation Cap Reductn	691	0	0	0
Spillback Cap Reductn	0	0	167	31
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.18	0.18	0.47

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1009: Shellmound Way & Christie Ave
2030 Plus Alt#3 SAT



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	56	148	576	537	155	416	412	785
v/c Ratio	0.14	0.38	0.97	0.92	1.60	0.37	0.56	0.76
Control Delay	35.6	29.1	49.4	39.2	322.7	17.6	3.2	39.9
Queue Delay	0.0	5.9	109.0	63.7	0.0	0.7	2.3	1.1
Total Delay	35.6	35.0	158.4	122.9	322.7	18.3	5.5	40.4
Queue Length 50th (ft)	33	63	406	372	~157	58	3	260
Queue Length 95th (ft)	69	124	#676	#610	m#226	m70	m17	335
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	385	596	589	97	1120	741	1031
Starvation Cap Reductn	0	0	91	84	0	393	205	0
Spillback Cap Reductn	15	182	139	137	0	0	31	89
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.73	1.26	1.19	1.60	0.57	0.77	0.83

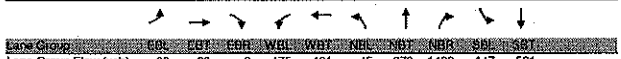
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St
2030 Plus Alt#3 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	373	73	751	1008	448	378
v/c Ratio	0.91	0.08	0.87	0.78	0.59	0.35
Control Delay	33.5	1.1	23.0	26.9	32.8	8.0
Queue Delay	0.6	0.0	0.4	6.0	0.0	0.0
Total Delay	34.1	1.1	23.4	33.0	32.8	8.0
Queue Length 50th (ft)	238	0	213	755	246	84
Queue Length 95th (ft)	m#347	m7	m241	m817	#454	163
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1001	1186	1294	756	1163
Starvation Cap Reductn	18	0	0	235	0	0
Spillback Cap Reductn	0	0	120	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.07	0.70	0.95	0.59	0.33

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd
2030 Plus Alt#3 SAT



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	475	461	45	370	1433	147	561
v/c Ratio	0.22	0.17	0.07	0.80	0.77	0.32	0.35	0.91	0.63	0.81
Control Delay	35.9	35.6	20.7	36.7	34.8	35.7	23.6	10.4	33.3	33.0
Queue Delay	0.0	0.0	0.0	4.4	5.2	0.0	0.0	0.0	0.0	3.0
Total Delay	35.9	35.6	20.7	41.0	39.1	35.7	23.6	10.4	33.3	35.9
Queue Length 50th (ft)	13	11	0	230	220	21	76	0	69	257
Queue Length 95th (ft)	39	34	13	#450	#433	54	128	#83	126	#491
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	596	308	1136	1583	431	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	22	67	67	0	0	0	0	83
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.90	0.87	0.15	0.33	0.91	0.34	0.88

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	950	1238	1172	282
v/c Ratio	0.68	0.20	0.71	0.86	0.88	0.37
Control Delay	51.4	13.9	22.7	24.7	34.0	4.8
Queue Delay	0.0	0.0	43.3	0.0	144.1	0.0
Total Delay	51.4	13.9	66.0	24.7	178.1	4.8
Queue Length 50th (ft)	87	64	315	730	891	16
Queue Length 95th (ft)	143	108	m318	m739	420	62
Internal Link Dist (ft)			818	215		
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1893	1343	1999	1592	865
Starvation Cap Reductn	0	0	466	0	311	0
Spillback Cap Reductn	0	2	0	0	702	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.20	1.08	0.86	1.32	0.33

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1373	1724	529	464	784	762
v/c Ratio	0.77	1.15	1.04	0.62	0.63	0.99	1.95
Control Delay	69.3	98.5	63.1	5.0	28.9	50.0	457.1
Queue Delay	0.0	210.7	97.0	0.0	0.0	66.0	245.2
Total Delay	69.3	309.3	150.0	5.3	29.5	116.0	702.3
Queue Length 50th (ft)	78	~424	~534	22	262	436	~955
Queue Length 95th (ft)	m123	#530	m#655	m40	382	#751	#1357
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	860	734	793	391
Starvation Cap Reductn	0	271	90	54	0	0	0
Spillback Cap Reductn	0	349	269	0	84	122	93
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.62	1.24	0.66	0.69	1.17	2.66

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	538	1538	827	380	816	321	153	161	110	616	1185
v/c Ratio	0.91	1.48	1.36	1.99	0.77	0.60	0.84	0.86	0.42	1.24	0.92
Control Delay	56.8	235.1	186.1	231.4	40.8	26.2	91.5	93.8	26.5	152.8	27.2
Queue Delay	0.0	21.0	2.0	0.0	2.4	0.0	0.0	0.0	0.0	126.4	92.0
Total Delay	56.8	256.1	188.1	231.4	43.2	26.2	91.5	93.8	26.5	279.1	119.2
Queue Length 50th (ft)	199	~791	~776	~358	275	125	121	127	25	~595	282
Queue Length 95th (ft)	m160	m#558	m#483	#545	350	222	m#235	m#249	m69	m#670	m#472
Internal Link Dist (ft)		365			570			520		295	
Turn Bay Length (ft)	400			200			55	120			
Base Capacity (vph)	593	1057	606	274	1062	536	183	188	261	495	1293
Starvation Cap Reductn	0	33	2	0	0	0	0	0	0	92	264
Spillback Cap Reductn	0	0	0	0	137	0	0	0	0	0	311
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	1.50	1.37	1.99	0.88	0.60	0.84	0.86	0.42	1.53	1.21

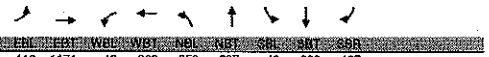
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1760	514
v/c Ratio	0.22	0.22	0.83	0.94	0.60
Control Delay	23.5	23.1	28.5	22.7	16.2
Queue Delay	1.2	0.7	2.2	2.3	0.0
Total Delay	24.7	23.8	30.8	25.0	16.2
Queue Length 50th (ft)	79	82	312	645	394
Queue Length 95th (ft)	127	114	370	#795	460
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1863	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	134	279	0	49	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.97	0.60

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street
2030 Plus Alt#3 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1171	43	862	359	337	40	308	107
v/c Ratio	1.02	1.07	0.42	1.00	0.87	0.78	0.10	0.75	0.26
Control Delay	130.2	74.5	43.6	56.1	44.9	36.4	21.2	34.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	74.5	43.6	56.1	44.9	36.4	21.2	34.0	6.7
Queue Length 50th (ft)	~52	~314	18	~208	144	130	13	118	0
Queue Length 95th (ft)	#142	#436	#51	#319	#284	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2871	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	108	1092	103	865	428	448	421	445	451
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.07	0.42	1.00	0.84	0.75	0.10	0.70	0.24

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street — 2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1605	190	1496	469	239	79
v/c Ratio	0.34	1.20	1.19	0.87	1.06	0.48	0.31
Control Delay	58.3	123.3	129.3	22.4	97.0	16.0	30.5
Queue Delay	0.0	179.2	0.0	116.3	0.0	0.3	0.0
Total Delay	58.3	302.5	129.3	137.7	97.0	16.3	30.5
Queue Length 50th (ft)	11	~815	~144	344	~390	45	42
Queue Length 95th (ft)	m28	#952	m#105	m#496	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	522	0	0	0
Spillback Cap Reductn	0	353	0	0	0	40	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.60	1.19	1.26	1.06	0.52	0.18

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue — 2030 Plus Alt#3 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1383	78	858	690	1232	170	1504
v/c Ratio	0.90	1.25	0.76	1.05	1.26	1.00	0.80	1.43
Control Delay	61.1	129.1	84.2	82.0	166.3	59.5	59.7	226.9
Queue Delay	0.0	35.3	0.0	57.2	409.3	0.0	0.0	1.2
Total Delay	61.1	164.4	84.2	139.2	575.7	59.5	59.7	228.1
Queue Length 50th (ft)	113	~564	50	~319	~285	~451	105	~687
Queue Length 95th (ft)	m135	m#432	#128	#444	#398	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3576
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1107	106	819	549	1232	239	1054
Starvation Cap Reductn	0	66	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	231	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.33	0.74	1.19	2.17	1.00	0.71	1.43

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #4
BASE YEAR

Queues
1001: Ashby (SR 13) & Seventh St — Marketplace Redevelopment — Existing Plus Alt#4 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	1182	111	692	99	237	64	210	202
v/c Ratio	0.97	0.68	0.64	0.68	0.53	0.62	0.24	0.76	0.50
Control Delay	68.2	23.1	46.8	52.7	50.5	45.1	42.0	54.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	23.1	46.8	52.7	50.5	45.1	42.0	54.6	9.2
Queue Length 50th (ft)	375	315	78	271	67	77	40	143	0
Queue Length 95th (ft)	#596	436	m119	#354	119	115	79	220	63
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	583	1740	193	1011	257	519	306	322	441
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.68	0.58	0.68	0.39	0.46	0.21	0.65	0.46

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	660	754	141	601	123	825
v/c Ratio	0.45	0.71	0.80	0.67	0.43	0.48	0.56
Control Delay	15.0	16.3	36.4	54.1	26.4	50.1	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	16.3	36.4	54.1	26.4	50.1	27.5
Queue Length 50th (ft)	15	107	256	96	167	81	225
Queue Length 95th (ft)	m15	65	293	160	240	141	346
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	213	1522	1052	257	1397	257	1478
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.57	0.72	0.55	0.43	0.48	0.66

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	137	39	309	25	501
v/c Ratio	0.71	0.46	0.20	0.28	0.14	0.49
Control Delay	25.2	22.9	18.7	8.0	21.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	22.9	18.7	8.0	21.0	10.3
Queue Length 50th (ft)	51	35	11	28	7	84
Queue Length 95th (ft)	#146	77	31	131	24	191
Internal Link Dist (ft)		663	1788		675		314
Turn Bay Length (ft)				110		75	
Base Capacity (vph)	398	301	283	1109	283	1017
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.46	0.14	0.28	0.09	0.49

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	436	441	425	376
v/c Ratio	0.28	0.27	0.44	0.25
Control Delay	11.8	2.4	5.4	17.0
Queue Delay	0.0	0.7	5.7	0.0
Total Delay	11.8	3.2	11.1	17.0
Queue Length 50th (ft)	43	6	0	74
Queue Length 95th (ft)	73	m3	m237	105
Internal Link Dist (ft)	335	234		1534
Turn Bay Length (ft)			145	
Base Capacity (vph)	1578	1628	958	1509
Starvation Cap Reductn	0	830	464	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.55	0.86	0.25

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	378	16	242	233	88	246
v/c Ratio	1.02	0.03	0.56	0.18	0.09	0.47
Control Delay	92.7	22.7	25.7	1.6	11.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.7	22.7	25.7	1.6	11.7	7.6
Queue Length 50th (ft)	~266	5	33	5	25	0
Queue Length 95th (ft)	#453	m20	46	6	52	63
Internal Link Dist (ft)	335			732	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	972	1236	1323	1014	527
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.02	0.20	0.18	0.09	0.47

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	23	17	397	418	96	42	798	65	328
v/c Ratio	0.03	0.14	0.11	0.61	0.63	0.45	0.04	0.50	0.34	0.65
Control Delay	35.8	36.2	18.2	25.1	25.7	33.2	19.1	1.1	33.5	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.2	18.2	25.1	25.7	33.2	19.1	1.1	33.5	23.3
Queue Length 50th (ft)	2	10	0	162	162	40	7	0	27	125
Queue Length 95th (ft)	14	36	20	#368	#394	95	19	0	71	229
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	400	421	370	728	737	398	1960	1583	496	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.05	0.55	0.57	0.25	0.03	0.50	0.13	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	129	441	739	927	843	139
v/c Ratio	0.38	0.20	0.54	0.64	0.85	0.25
Control Delay	39.3	4.8	19.6	7.8	35.1	4.7
Queue Delay	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	39.3	4.8	20.1	7.8	35.2	4.7
Queue Length 50th (ft)	72	26	107	255	269	0
Queue Length 95th (ft)	129	59	m206	m373	300	39
Internal Link Dist (ft)		818	296			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	336	2155	1362	1441	1373	717
Starvation Cap Reductn	0	0	279	0	0	0
Spillback Cap Reductn	0	1	0	0	24	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.20	0.68	0.64	0.62	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	80	999	1026	322	582	685	672
v/c Ratio	0.25	0.42	0.69	0.44	0.91	1.09	0.94
Control Delay	25.2	9.2	20.1	2.8	50.1	65.5	47.7
Queue Delay	0.0	2.1	0.2	0.0	0.0	2.7	0.6
Total Delay	25.2	11.2	20.3	2.8	50.1	68.2	48.3
Queue Length 50th (ft)	18	155	128	1	364	~479	388
Queue Length 95th (ft)	m44	141	159	10	#587	#724	#650
Internal Link Dist (ft)		736	965			1448	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1494	726	639	634	712
Starvation Cap Reductn	0	1194	0	0	0	0	0
Spillback Cap Reductn	0	117	67	0	0	4	4
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.84	0.72	0.44	0.91	1.09	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	748	1201	347	49	647	182	24	25	46	173	670
v/c Ratio	1.07	0.85	0.38	0.08	0.68	0.39	0.21	0.22	0.31	0.32	0.44
Control Delay	91.3	22.1	1.4	38.4	25.9	14.5	44.7	44.8	15.3	30.8	7.6
Queue Delay	18.5	1.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.8	23.8	1.6	38.4	25.9	14.5	44.7	44.8	15.3	30.8	7.6
Queue Length 50th (ft)	~275	276	7	28	113	35	15	16	0	91	3
Queue Length 95th (ft)	m#375	m#479	m12	m43	145	m65	41	43	34	141	81
Internal Link Dist (ft)		966			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	699	1416	913	142	956	470	165	186	216	539	1523
Starvation Cap Reductn	0	95	124	0	0	0	0	0	0	0	63
Spillback Cap Reductn	29	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.91	0.44	0.35	0.68	0.39	0.15	0.13	0.21	0.32	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	21	45	217	7	22	444	110
v/c Ratio	0.03	0.03	0.14	0.08	0.22	0.29	0.17
Control Delay	19.4	19.0	2.4	45.0	19.4	18.4	36.2
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	19.4	19.0	2.7	45.0	19.4	18.4	36.2
Queue Length 50th (ft)	8	9	0	4	0	92	69
Queue Length 95th (ft)	26	22	21	19	24	127	115
Internal Link Dist (ft)		119				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	680	1405	1611	212	209	1554	661
Starvation Cap Reductn	0	0	933	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.32	0.03	0.11	0.29	0.17

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	386	652	37	524	293	216	28	153	101
v/c Ratio	0.78	0.39	0.28	0.65	0.82	0.58	0.12	0.63	0.34
Control Delay	34.4	12.3	46.6	38.2	46.7	37.2	31.3	38.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	12.3	46.6	38.2	46.7	37.2	31.3	38.9	9.9
Queue Length 50th (ft)	261	133	22	155	181	123	18	95	0
Queue Length 95th (ft)	m#435	m230	54	212	277	200	29	100	39
Internal Link Dist (ft)		159		1493		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	492	1653	159	809	414	494	372	391	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.39	0.23	0.65	0.71	0.50	0.08	0.39	0.25

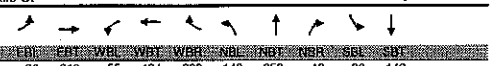
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	304	97	459	112	548	53	702
v/c Ratio	0.63	0.52	0.59	0.72	0.61	0.28	0.41	0.39
Control Delay	65.8	30.0	50.0	38.9	45.6	14.1	45.9	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	30.0	50.0	38.9	45.6	14.1	45.9	17.8
Queue Length 50th (ft)	47	71	60	145	69	96	33	143
Queue Length 95th (ft)	#108	110	111	185	120	158	70	230
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	898	212	1058	301	1940	230	1779
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.34	0.46	0.43	0.37	0.28	0.23	0.39

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	239	47	334	66	98	91	36
v/c Ratio	0.25	0.12	0.39	0.19	0.07	0.52	0.43	0.16
Control Delay	48.0	11.5	50.1	11.9	4.9	43.3	30.4	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	11.5	50.1	11.9	4.9	43.3	30.4	28.6
Queue Length 50th (ft)	16	26	29	33	0	61	38	17
Queue Length 95th (ft)	42	76	64	113	27	109	85	39
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	128	1964	140	2121	975	478	496	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.12	0.34	0.16	0.07	0.21	0.18	0.08

Intersection Summary

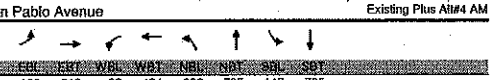


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	210	55	404	220	140	250	42	80	149
v/c Ratio	0.26	0.13	0.42	0.22	0.24	0.68	0.59	0.13	0.62	0.44
Control Delay	46.9	15.7	48.9	17.3	4.1	49.2	34.5	9.0	63.9	31.9
Queue Delay	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	15.7	48.9	17.8	4.6	49.2	34.5	9.0	63.9	31.9
Queue Length 50th (ft)	19	27	34	67	0	87	186	0	52	91
Queue Length 95th (ft)	47	71	71	142	50	146	188	25	#112	94
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1672	164	1816	920	266	671	489	142	537
Starvation Cap Reductn	0	0	0	946	383	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.34	0.46	0.41	0.53	0.37	0.09	0.56	0.28

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

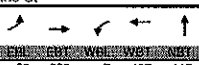
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	315	75	617	164	120	37
v/c Ratio	0.04	0.17	0.53	0.29	0.87	0.28	0.26
Control Delay	47.3	17.8	49.7	8.2	52.9	6.6	37.5
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	17.8	49.7	8.4	52.9	6.6	37.5
Queue Length 50th (ft)	2	57	44	22	99	0	21
Queue Length 95th (ft)	11	121	m84	202	#190	42	46
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1803	185	2100	297	516	323
Starvation Cap Reductn	0	0	0	699	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.38	0.34	0.69	0.23	0.11

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	319	32	494	282	785	147	795
v/c Ratio	0.82	0.51	0.18	0.80	0.59	0.46	0.73	0.49
Control Delay	60.6	39.0	46.1	43.0	45.8	21.0	47.6	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	39.0	46.1	43.0	45.8	21.0	47.6	21.9
Queue Length 50th (ft)	45	42	18	115	88	181	82	193
Queue Length 95th (ft)	123	142	m47	190	130	293	149	282
Internal Link Dist (ft)		271		418		708		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1025	193	759	481	1716	301	1614
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.31	0.17	0.65	0.59	0.46	0.49	0.49

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	52	339	7	497	145	318
v/c Ratio	0.27	0.15	0.05	0.24	0.27	0.80
Control Delay	12.6	5.7	21.2	6.3	16.5	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	5.7	21.2	6.3	16.5	19.4
Queue Length 50th (ft)	20	47	2	21	18	36
Queue Length 95th (ft)	m22	89	11	70	36	68
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	2240	212	2076	592	579
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.03	0.24	0.24	0.55

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	120	84	28	8	285	166
v/c Ratio	0.38	0.24	0.15	0.05	0.29	0.17
Control Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	13.4	9.3	6.8	6.2
Queue Length 50th (ft)	8	1	2	0	16	8
Queue Length 95th (ft)	53	26	21	8	95	56
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	814	789	719	630	1317	1298
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.11	0.04	0.01	0.22	0.13

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	177	233	1043	862
v/c Ratio	0.57	0.58	0.45	0.37
Control Delay	46.2	43.7	9.9	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.2	43.7	9.9	9.0
Queue Length 50th (ft)	56	76	159	121
Queue Length 95th (ft)	92	112	245	189
Internal Link Dist (ft)	2	922	0	798
Turn Bay Length (ft)				
Base Capacity (vph)	397	627	2318	2305
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.45	0.37

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	393	721	506	759
v/c Ratio	0.34	0.97	0.26	0.25
Control Delay	25.4	32.6	11.1	10.7
Queue Delay	0.0	0.0	0.8	0.0
Total Delay	25.4	32.6	11.8	10.7
Queue Length 50th (ft)	92	250	85	87
Queue Length 95th (ft)	130	#502	116	112
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1298	801	1956	3016
Starvation Cap Reductn	0	0	1084	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.90	0.56	0.25

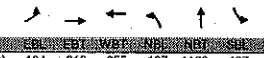
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	242	546	240	542
v/c Ratio	0.61	0.28	0.48	0.20
Control Delay	22.3	9.0	28.9	2.8
Queue Delay	0.0	0.0	0.0	0.4
Total Delay	22.3	9.0	28.9	3.2
Queue Length 50th (ft)	41	56	50	25
Queue Length 95th (ft)	71	101	78	45
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1995	1952	856	2689
Starvation Cap Reductn	0	0	0	1595
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.28	0.38	0.50

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	817	114	867	193	578	141	285	501
v/c Ratio	0.87	0.60	0.61	0.80	0.61	0.91	0.44	0.84	0.83
Control Delay	61.6	29.2	68.5	28.2	48.8	57.7	43.0	57.4	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	29.2	68.5	28.2	48.8	57.7	43.0	57.4	21.5
Queue Length 50th (ft)	194	241	77	262	134	208	87	192	75
Queue Length 95th (ft)	#330	318	m114	#433	m184	m#276	149	#315	#252
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1357	225	1086	322	645	354	373	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.60	0.51	0.80	0.60	0.90	0.40	0.76	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

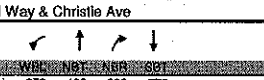


Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	104	812	855	187	1133	197	998
v/c Ratio	0.79	0.71	0.87	0.76	0.75	0.82	0.67
Control Delay	46.6	33.0	35.5	58.7	31.9	72.7	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	33.0	35.5	58.7	31.9	72.7	30.0
Queue Length 50th (ft)	77	304	295	126	434	137	288
Queue Length 95th (ft)	m116	m332	307	#217	#577	#258	#493
Internal Link Dist (ft)		1209	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	175	1518	1306	274	1503	241	1492
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.55	0.65	0.68	0.75	0.82	0.67

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	478	186	177	699	21	502
v/c Ratio	1.12	0.40	0.80	0.72	0.12	0.75
Control Delay	104.8	17.7	45.7	18.3	22.4	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.8	17.7	45.7	18.3	22.4	22.3
Queue Length 50th (ft)	~185	45	58	191	6	115
Queue Length 95th (ft)	#342	92	m#127	#444	m16	173
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	426	468	225	972	228	668
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.40	0.79	0.72	0.09	0.75

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	979	492	360	778
v/c Ratio	0.61	0.31	0.43	0.52
Control Delay	12.3	2.8	2.2	23.1
Queue Delay	1.9	0.6	1.8	0.1
Total Delay	14.1	3.4	3.9	23.2
Queue Length 50th (ft)	139	12	27	201
Queue Length 95th (ft)	177	m12	m20	258
Internal Link Dist (ft)	335	234		1634
Turn Bay Length (ft)			145	
Base Capacity (vph)	1614	1609	884	1489
Starvation Cap Reductn	451	721	338	0
Spillback Cap Reductn	215	0	15	122
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.55	0.70	0.57

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	362	37	513	693	279	466
v/c Ratio	0.89	0.05	0.64	0.53	0.35	0.84
Control Delay	27.4	0.1	21.0	6.9	24.8	27.3
Queue Delay	0.2	0.0	0.1	0.0	0.0	0.2
Total Delay	27.7	0.1	21.1	6.9	24.8	27.5
Queue Length 50th (ft)	50	0	88	390	132	148
Queue Length 95th (ft)	#263	m0	112	533	229	277
Internal Link Dist (ft)	335			793	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	962	1155	1301	797	603
Starvation Cap Reductn	5	0	0	0	0	0
Spillback Cap Reductn	0	0	86	0	0	6
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.04	0.48	0.53	0.35	0.78

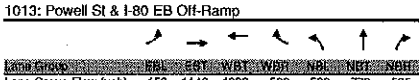
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	402	65	274	289	12	711	1566	274	622
v/c Ratio	0.58	1.19	0.21	0.77	0.80	0.13	0.86	0.99	0.84	0.76
Control Delay	44.9	146.2	28.2	39.5	40.5	47.0	41.1	23.3	45.7	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	146.2	28.2	39.5	40.5	47.0	41.1	23.3	45.7	29.3
Queue Length 50th (ft)	104	~306	23	166	169	7	210	0	154	273
Queue Length 95th (ft)	#202	#524	64	257	271	26	#333	#238	#261	#585
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	321	338	305	453	455	250	901	1583	400	819
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.19	0.21	0.60	0.64	0.05	0.79	0.99	0.69	0.76

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	152	1050	1352	1243	871	359
v/c Ratio	0.47	0.46	0.99dr	0.89	0.87	0.61
Control Delay	45.8	4.9	19.1	20.8	42.1	6.4
Queue Delay	0.0	0.0	204.2	0.0	0.4	0.0
Total Delay	45.8	4.9	223.3	20.8	42.5	6.4
Queue Length 50th (ft)	97	66	449	719	298	12
Queue Length 95th (ft)	163	117	m369	m557	359	81
Internal Link Dist (ft)			816	236		
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2270	1446	1399	1124	743
Starvation Cap Reductn	0	0	520	0	0	0
Spillback Cap Reductn	0	6	0	0	45	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.46	1.46	0.89	0.81	0.48

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1146	1998	526	598	779	535
v/c Ratio	0.45	0.77	1.16	0.70	1.06	1.94	1.53
Control Delay	65.3	13.5	117.0	9.5	90.5	190.7	278.1
Queue Delay	0.0	2.2	189.5	0.6	10.9	2.0	0.0
Total Delay	65.3	15.6	306.5	10.2	101.4	192.7	278.1
Queue Length 50th (ft)	110	73	~675	59	~488	~736	~891
Queue Length 95th (ft)	m155	100	m#692	m62	#716	#997	#852
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275				400	625	
Base Capacity (vph)	338	1489	1687	753	565	563	349
Starvation Cap Reductn	0	209	111	51	0	0	0
Spillback Cap Reductn	0	92	444	0	16	2	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.90	1.61	0.76	1.09	1.34	1.53

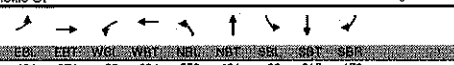
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	653	925	636	282	1075	242	78	82	72	479	1180
v/c Ratio	1.23	0.92	0.90	1.03	1.01	0.48	0.36	0.38	0.27	0.97	0.98
Control Delay	151.5	39.1	19.6	108.6	69.5	29.2	50.2	50.5	24.8	62.3	31.5
Queue Delay	0.0	6.9	2.1	0.0	285.0	0.0	0.0	0.0	0.0	82.2	55.4
Total Delay	151.5	43.0	21.9	108.6	354.5	29.2	50.2	50.5	24.8	144.5	86.9
Queue Length 50th (ft)	~298	~290	300	~214	~408	113	63	66	20	~296	92
Queue Length 95th (ft)	m#288	m290	m324	#382	#554	191	116	121	68	#541	#431
Internal Link Dist (ft)		365			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1005	705	274	1062	506	214	217	264	492	1208
Starvation Cap Reductn	0	44	21	0	0	0	0	0	0	94	24
Spillback Cap Reductn	0	0	0	0	418	0	0	0	0	0	169
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.96	0.93	1.03	1.67	0.48	0.36	0.38	0.27	1.20	1.14

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

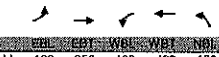
Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	80	155	773	51	105	1048	316
v/c Ratio	0.13	0.12	0.46	0.42	0.51	0.85	0.47
Control Delay	30.3	29.2	6.4	50.5	12.6	25.6	43.3
Queue Delay	1.3	0.0	0.8	0.0	0.0	0.0	0.0
Total Delay	31.6	29.2	7.2	50.5	12.6	25.6	43.3
Queue Length 50th (ft)	51	49	1	35	0	293	230
Queue Length 95th (ft)	102	82	151	73	52	366	314
Internal Link Dist (ft)		140				820	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	593	1249	1703	241	307	1603	668
Starvation Cap Reductn	377	0	572	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.12	0.59	0.21	0.34	0.65	0.47

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	974	22	694	559	484	63	215	170
v/c Ratio	1.14	0.94	0.24	0.95	0.76	0.63	0.26	0.82	0.47
Control Delay	160.0	54.3	55.7	66.0	36.6	31.2	43.8	49.2	12.1
Queue Delay	0.0	0.0	0.0	0.0	7.8	2.7	0.0	0.0	0.0
Total Delay	160.0	54.3	55.7	66.0	44.1	33.8	43.8	49.2	12.1
Queue Length 50th (ft)	~159	324	15	253	302	249	39	134	3
Queue Length 95th (ft)	#295	#548	42	#373	#583	456	93	241	92
Internal Link Dist (ft)		159		1403		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1036	97	731	752	763	490	526	556
Starvation Cap Reductn	0	0	0	0	135	171	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.94	0.23	0.95	0.94	0.82	0.13	0.41	0.31

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	139	856	109	488	152	1189	122	1053
v/c Ratio	0.76	0.88	0.64	0.56	0.71	0.91	0.69	0.85
Control Delay	59.5	40.8	49.9	29.8	47.6	40.6	53.4	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	40.8	49.9	29.8	47.6	40.6	53.4	37.6
Queue Length 50th (ft)	78	232	60	117	83	~386	67	307
Queue Length 95th (ft)	#165	#338	113	165	145	#520	#137	#467
Internal Link Dist (ft)		207		2835		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	991	197	972	266	1306	197	1232
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.87	0.55	0.50	0.57	0.91	0.62	0.85

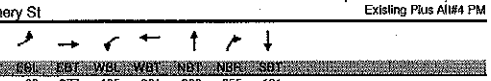
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	896	87	648	29	226	232	182
v/c Ratio	0.25	0.58	0.57	0.36	0.04	0.75	0.70	0.65
Control Delay	48.1	25.4	57.5	19.8	9.9	41.6	32.5	39.3
Queue Delay	0.0	1.6	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	48.1	27.0	57.5	20.4	9.9	41.6	32.5	39.3
Queue Length 50th (ft)	16	207	53	103	0	140	112	109
Queue Length 95th (ft)	42	#456	#120	272	23	195	171	154
Internal Link Dist (ft)		248		256			993	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	129	1542	158	1809	789	478	492	492
Starvation Cap Reductn	0	444	0	757	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.82	0.55	0.62	0.04	0.47	0.47	0.37

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	731	153	541	198	204	303	125	225	393
v/c Ratio	0.39	0.58	0.75	0.36	0.26	0.96	0.68	0.27	1.06	0.90
Control Delay	46.8	28.1	57.1	22.4	4.5	98.3	38.1	6.2	120.1	42.7
Queue Delay	0.0	1.2	0.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	29.3	57.1	23.2	4.9	98.3	38.1	6.2	120.1	42.7
Queue Length 50th (ft)	31	194	94	125	0	131	174	0	#158	234
Queue Length 95th (ft)	67	275	#177	192	48	#273	251	42	#309	292
Internal Link Dist (ft)		250		214			398			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1269	231	1511	751	212	540	530	212	531
Starvation Cap Reductn	0	307	0	633	234	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.76	0.66	0.62	0.36	0.96	0.96	0.24	1.06	0.74

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	33	977	135	861	328	255	191
v/c Ratio	0.18	0.75	0.70	0.59	0.86	0.50	0.71
Control Delay	40.0	34.2	52.1	18.6	47.6	8.6	45.0
Queue Delay	0.0	19.9	0.0	0.4	0.0	0.0	0.0
Total Delay	40.0	54.1	52.1	19.0	47.6	8.6	45.0
Queue Length 50th (ft)	19	278	91	110	201	12	115
Queue Length 95th (ft)	47	#510	m54	m#288	#296	76	179
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1305	301	1454	452	502	348
Starvation Cap Reductn	0	347	0	188	0	0	0
Spillback Cap Reductn	0	23	0	0	0	7	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.02	0.45	0.68	0.73	0.48	0.55

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	223	932	50	592	459	1051	241	1163
v/c Ratio	0.92	0.94	0.52	0.92	1.03	0.78	0.95	0.85
Control Delay	56.6	39.7	61.3	49.0	94.0	32.6	90.0	34.9
Queue Delay	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.9
Total Delay	56.6	43.5	61.3	49.0	94.0	32.6	90.0	35.8
Queue Length 50th (ft)	142	82	33	184	162	311	155	353
Queue Length 95th (ft)	m#228	#376	m71	#251	#261	394	#308	#462
Internal Link Dist (ft)		271		418		708		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	251	990	106	670	446	1345	253	1373
Starvation Cap Reductn	0	32	0	0	0	0	0	60
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.97	0.47	0.87	1.03	0.78	0.95	0.89

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	17	739	10	597	276	377
v/c Ratio	0.10	0.33	0.07	0.27	0.49	0.66
Control Delay	20.6	6.6	21.2	5.2	19.1	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	6.6	21.2	5.2	19.1	17.1
Queue Length 50th (ft)	7	101	3	27	35	86
Queue Length 95th (ft)	m7	m113	14	81	63	71
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	2221	249	2177	648	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.04	0.27	0.43	0.59

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	195	103	39	26	376	399
v/c Ratio	0.55	0.26	0.20	0.14	0.44	0.44
Control Delay	13.0	7.2	17.7	9.7	9.6	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	7.2	17.7	9.7	9.6	9.6
Queue Length 50th (ft)	15	3	3	0	25	27
Queue Length 95th (ft)	99	39	33	17	154	162
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	779	781	692	620	1156	1216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.13	0.06	0.04	0.32	0.33

Intersection Summary

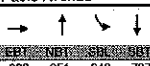
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	270	277	1295	1459
v/c Ratio	0.69	0.83	0.60	0.67
Control Delay	46.8	43.3	14.4	15.9
Queue Delay	0.0	0.0	0.4	0.0
Total Delay	46.8	43.3	14.9	15.9
Queue Length 50th (ft)	90	88	256	309
Queue Length 95th (ft)	131	127	391	457
Internal Link Dist (ft)	2	922	3	766
Turn Bay Length (ft)				
Base Capacity (vph)	468	506	2171	2165
Starvation Cap Reductn	0	0	392	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.46	0.73	0.67

Intersection Summary

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	328	597	923	1354
v/c Ratio	0.81	1.02	0.47	0.44
Control Delay	25.4	67.5	10.6	9.8
Queue Delay	0.1	0.0	5.5	0.1
Total Delay	25.5	67.5	16.1	9.9
Queue Length 50th (ft)	75	~282	138	135
Queue Length 95th (ft)	111	#502	182	166
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1050	585	1945	3103
Starvation Cap Reductn	0	0	948	0
Spillback Cap Reductn	148	0	0	563
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	1.02	0.93	0.53

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

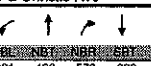
1028: 35th St & San Pablo Avenue



Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	626	951	643	797
v/c Ratio	0.82	0.61	0.82	0.32
Control Delay	44.3	26.5	43.5	6.7
Queue Delay	0.3	0.8	12.7	2.0
Total Delay	44.6	27.3	56.2	8.7
Queue Length 50th (ft)	216	262	223	98
Queue Length 95th (ft)	272	386	270	144
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	892	1565	967	2515
Starvation Cap Reductn	0	0	306	1514
Spillback Cap Reductn	36	313	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.76	0.97	0.80

Intersection Summary

1009: Shellmound Way & Christie Ave



Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	1081	490	570	628
v/c Ratio	0.62	0.33	0.61	0.46
Control Delay	8.3	11.5	10.3	24.5
Queue Delay	2.1	1.2	19.8	0.1
Total Delay	10.3	12.7	30.1	24.6
Queue Length 50th (ft)	69	114	325	165
Queue Length 95th (ft)	101	m86	m284	217
Internal Link Dist (ft)	342	235		1556
Turn Bay Length (ft)			85	
Base Capacity (vph)	1739	1480	942	1355
Starvation Cap Reductn	478	739	372	0
Spillback Cap Reductn	285	0	106	122
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.86	0.66	1.00	0.51

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

1010: Shellmound Way & Shellmound St

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	525	55	717	924	292	380
v/c Ratio	1.05	0.06	0.82	0.77	0.44	0.35
Control Delay	73.5	0.1	17.6	23.1	31.3	8.0
Queue Delay	11.1	0.0	0.1	4.0	0.0	0.0
Total Delay	84.6	0.1	17.8	27.1	31.3	8.0
Queue Length 50th (ft)	~385	0	193	647	157	83
Queue Length 95th (ft)	#602	m1	m206	m765	261	162
Internal Link Dist (ft)	342			739	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1069	1166	1202	659	1068
Starvation Cap Reductn	14	0	0	199	0	0
Spillback Cap Reductn	0	0	60	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.05	0.64	0.92	0.44	0.35

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

1011: I-80 WB Ramps & Frontage Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	463	459	45	278	1149	130	473
v/c Ratio	0.20	0.16	0.06	0.70	0.88	0.30	0.81	0.73	0.58	0.79
Control Delay	35.7	35.6	20.7	30.7	29.6	35.3	23.1	2.9	32.6	28.2
Queue Delay	0.0	0.0	0.0	1.1	0.8	0.0	0.0	0.0	0.0	0.6
Total Delay	35.7	35.6	20.7	31.8	30.5	35.3	23.1	2.9	32.6	28.8
Queue Length 50th (ft)	13	11	0	222	212	21	54	0	61	202
Queue Length 95th (ft)	39	34	13	#434	#417	54	98	0	115	#380
Internal Link Dist (ft)		785			24		250			241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	344	362	314	858	859	327	1119	1593	456	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	15	61	61	0	0	0	0	59
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.03	0.76	0.76	0.14	0.25	0.73	0.29	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd
Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	297	749	997	1078	263
v/c Ratio	0.68	0.15	0.52	0.71	0.89	0.37
Control Delay	51.4	12.2	17.5	15.6	35.3	4.3
Queue Delay	0.0	0.0	2.8	0.0	6.7	0.0
Total Delay	51.4	12.2	20.3	15.6	42.0	4.3
Queue Length 50th (ft)	65	48	220	617	363	7
Queue Length 95th (ft)	141	83	302	673	399	54
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	2029	1429	1399	1592	867
Starvation Cap Reductn	0	0	543	0	254	0
Spillback Cap Reductn	0	0	0	0	483	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.15	0.65	0.71	0.96	0.30

Intersection Summary

Queues
1013: Powell St & I-80 EB Off-Ramp
Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1254	1941	470	404	636	613
v/c Ratio	0.74	1.05	0.80	0.57	0.55	0.80	1.56
Control Delay	67.5	60.5	30.6	5.3	26.5	23.1	286.8
Queue Delay	0.0	144.1	0.8	0.2	0.3	0.0	0.0
Total Delay	67.5	204.6	31.4	5.5	26.9	23.1	286.8
Queue Length 50th (ft)	69	~563	336	39	217	281	~1049
Queue Length 95th (ft)	m116	#438	404	m63	320	437	#950
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1678	827	734	795	392
Starvation Cap Reductn	0	288	118	52	0	0	0
Spillback Cap Reductn	0	0	66	0	64	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.08	0.86	0.61	0.60	0.80	1.56

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	751	1109	620	293	480	247	153	161	110	517	1071
v/c Ratio	1.27	0.96	1.01	1.07	0.45	0.44	0.84	0.86	0.42	1.04	0.80
Control Delay	166.5	29.9	30.9	119.0	32.9	15.3	91.5	93.8	26.5	79.4	26.8
Queue Delay	79.1	2.4	1.3	0.0	0.1	0.9	0.0	0.0	0.0	88.8	2.0
Total Delay	245.7	32.3	32.2	119.0	32.9	15.6	91.5	93.8	26.5	168.2	28.8
Queue Length 50th (ft)	~342	244	~215	~230	144	53	121	127	25	~466	350
Queue Length 95th (ft)	m#308	m220	m188	#401	193	127	m#235	m#249	m69	#596	428
Internal Link Dist (ft)		366			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1160	616	274	1060	559	183	188	261	497	1344
Starvation Cap Reductn	0	25	3	0	0	0	0	0	0	86	146
Spillback Cap Reductn	73	0	0	0	53	57	0	0	0	0	24
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.44	0.97	1.01	1.07	0.46	0.49	0.84	0.86	0.42	1.26	0.89

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	114	237	1114	55	130	1420	350
v/c Ratio	0.20	0.20	0.79	0.44	0.56	0.87	0.53
Control Delay	31.3	30.4	33.0	50.5	12.1	23.9	33.7
Queue Delay	1.2	0.7	1.9	0.0	0.4	0.2	0.0
Total Delay	32.6	31.1	35.0	50.5	12.6	24.1	33.7
Queue Length 50th (ft)	67	69	280	38	0	522	236
Queue Length 95th (ft)	135	117	381	78	57	622	353
Internal Link Dist (ft)		150				920	733
Turn Bay Length (ft)	200						
Base Capacity (vph)	575	1210	1841	241	326	1639	656
Starvation Cap Reductn	307	669	356	0	0	0	0
Spillback Cap Reductn	11	0	0	0	39	18	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.44	0.87	0.23	0.45	0.88	0.53

Intersection Summary

Queues
1016: Powell St & Hollis Street — Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	733	40	691	252	187	35	190	97
v/c Ratio	0.56	0.46	0.33	0.49	0.67	0.47	0.11	0.54	0.26
Control Delay	50.1	17.6	37.9	22.2	26.5	22.6	21.3	25.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	17.6	37.9	22.2	26.5	22.6	21.3	25.0	6.8
Queue Length 50th (ft)	27	89	15	122	85	57	12	64	0
Queue Length 95th (ft)	#93	#224	44	#228	164	118	34	124	33
Internal Link Dist (ft)		922		1493		3624		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	129	1588	123	1424	467	487	458	482	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.46	0.33	0.49	0.54	0.38	0.08	0.39	0.21

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5:00 pm Baseline
Fehr & Peers Associates, Inc.

Synchro 6 Report
Page 8

Queues
1021: 40th St & Emery Street — Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	20	1042	165	1072	204	197	59
v/c Ratio	0.32	0.63	1.04	0.53	0.72	0.48	0.24
Control Delay	62.4	14.5	104.6	13.6	42.4	7.0	27.7
Queue Delay	0.0	0.3	0.0	1.2	0.0	0.0	0.0
Total Delay	62.4	14.8	104.6	14.8	42.4	7.0	27.7
Queue Length 50th (ft)	14	41	~116	67	126	0	27
Queue Length 95th (ft)	m22	#536	m#169	m#431	182	54	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1660	159	2034	441	530	445
Starvation Cap Reductn	0	0	0	677	0	0	0
Spillback Cap Reductn	0	104	0	0	0	9	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.70	1.04	0.79	0.46	0.38	0.13

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

5:00 pm Baseline
Fehr & Peers Associates, Inc.

Synchro 6 Report
Page 9

Queues
1022: 40th St & San Pablo Avenue — Existing Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	180	942	75	538	522	728	123	943
v/c Ratio	0.80	0.85	0.74	0.64	0.96	0.67	0.68	0.91
Control Delay	63.6	18.5	80.7	37.3	70.8	27.8	50.5	45.3
Queue Delay	0.0	1.5	0.0	0.7	15.8	0.0	0.0	0.1
Total Delay	63.6	20.1	80.7	38.1	86.4	27.8	50.5	45.4
Queue Length 50th (ft)	84	266	46	160	171	192	77	292
Queue Length 95th (ft)	#217	#362	#121	218	#273	264	132	#413
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1100	108	839	540	1267	239	1041
Starvation Cap Reductn	0	61	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	85	99	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.90	0.71	0.72	1.02	0.57	0.51	0.91

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5:00 pm Baseline
Fehr & Peers Associates, Inc.

Synchro 6 Report
Page 10

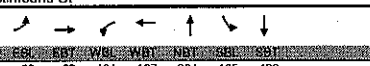
SYNCHRO QUEUE SHEETS
ALTERNATIVE #4
2010

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	541	1241	109	813	127	304	64	234	208
v/c Ratio	0.97	0.75	0.63	0.87	0.60	0.70	0.23	0.80	0.49
Control Delay	67.5	26.5	49.8	56.1	52.2	46.7	41.6	58.3	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	26.5	49.8	56.1	52.2	46.7	41.6	58.3	9.2
Queue Length 50th (ft)	374	467	79	321	88	100	39	158	0
Queue Length 95th (ft)	#593	481	m98	#464	146	143	79	#264	64
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1664	193	930	257	521	306	322	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.75	0.56	0.87	0.49	0.58	0.21	0.73	0.47

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

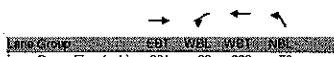
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	890	787	204	777	124	983
v/c Ratio	0.75	0.69	0.90	0.89	0.59	0.48	0.74
Control Delay	24.3	14.6	36.3	68.5	30.9	50.2	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	14.6	36.3	68.5	30.9	50.2	34.5
Queue Length 50th (ft)	23	77	261	141	228	82	312
Queue Length 95th (ft)	m31	88	316	#258	322	142	#466
Internal Link Dist (ft)		1299	1605		686		1488
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	201	1522	1031	257	1316	257	1334
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.76	0.79	0.59	0.48	0.74

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	60	69	161	167	304	125	436
v/c Ratio	0.11	0.08	0.26	0.20	0.70	0.29	0.59
Control Delay	13.2	12.0	11.7	3.9	20.9	10.8	12.9
Queue Delay	0.0	0.0	0.6	0.4	0.0	0.0	0.0
Total Delay	13.2	12.0	12.3	4.3	20.9	10.8	12.9
Queue Length 50th (ft)	12	13	30	5	89	26	100
Queue Length 95th (ft)	39	40	62	30	141	42	135
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	562	861	618	839	595	450	992
Starvation Cap Reductn	0	0	222	342	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.08	0.41	0.34	0.51	0.28	0.44

Intersection Summary



Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	281	26	268	73
v/c Ratio	0.16	0.03	0.17	0.35
Control Delay	2.1	2.3	2.3	21.5
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	2.4	2.3	2.3	21.5
Queue Length 50th (ft)	19	2	19	21
Queue Length 95th (ft)	56	7	43	52
Internal Link Dist (ft)	114		683	743
Turn Bay Length (ft)				
Base Capacity (vph)	1563	835	1569	780
Starvation Cap Reductn	769	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.03	0.17	0.09

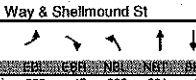
Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	312	161	38	323	24	581
v/c Ratio	0.85	0.53	0.19	0.20	0.14	0.57
Control Delay	39.9	24.9	18.4	7.8	20.9	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	24.9	18.4	7.8	20.9	12.3
Queue Length 50th (ft)	67	42	10	30	7	66
Queue Length 95th (ft)	#188	#89	27	137	23	#277
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	368	304	283	1109	283	1018
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.53	0.13	0.29	0.08	0.57

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

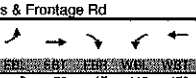
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	257	239	62	403	407	426
v/c Ratio	0.65	0.59	0.98	0.88	0.10	0.17	0.34	0.20
Control Delay	72.9	20.3	98.8	84.2	0.4	0.4	2.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Delay	72.9	20.3	98.8	84.2	0.4	0.4	3.2	6.8
Queue Length 50th (ft)	45	0	181	164	1	2	2	49
Queue Length 95th (ft)	#112	56	#341	#305	m0	m1	m60	69
Internal Link Dist (ft)	75			335		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	260	271	612	2339	1184	2175
Starvation Cap Reductn	0	0	0	0	0	0	475	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	0.96	0.88	0.10	0.17	0.57	0.20

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	362	45	266	291	99	280
v/c Ratio	0.97	0.09	0.72	0.22	0.09	0.51
Control Delay	83.9	20.8	35.8	2.2	11.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.9	20.8	35.8	2.2	11.0	7.7
Queue Length 50th (ft)	250	13	69	5	27	0
Queue Length 95th (ft)	#430	m46	108	7	55	67
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	580	1236	1323	1040	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.08	0.22	0.22	0.09	0.51

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	448	473	93	93	961	80	336
v/c Ratio	0.04	0.18	0.13	0.86	0.69	0.47	0.09	0.82	0.44	0.72
Control Delay	35.8	36.0	18.1	28.7	29.8	34.0	19.5	1.8	33.9	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	18.1	28.7	29.8	34.0	19.5	1.8	33.9	25.6
Queue Length 50th (ft)	2	9	0	183	192	39	16	0	34	129
Queue Length 95th (ft)	14	35	20	#436	#468	93	35	0	83	235
Internal Link Dist (ft)		785			24		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	351	369	327	680	697	951	1223	1593	444	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.05	0.66	0.69	0.26	0.09	0.62	0.18	0.49

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	427	767	1118	965	136
v/c Ratio	0.37	0.21	0.63	0.79	0.86	0.22
Control Delay	39.1	5.8	19.6	14.4	34.1	4.3
Queue Delay	0.0	0.0	1.2	0.0	0.2	0.0
Total Delay	39.1	5.8	20.8	14.4	34.3	4.3
Queue Length 50th (ft)	70	31	98	586	294	0
Queue Length 95th (ft)	126	63	m225	m713	332	36
Internal Link Dist (ft)		618	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	936	2035	1228	1441	1373	715
Starvation Cap Reductn	0	0	246	0	0	0
Spillback Cap Reductn	0	0	0	0	49	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.79	0.78	0.73	0.19

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	1114	1242	372	608	702	690
v/c Ratio	0.24	0.47	0.84	0.49	0.95	1.13	0.98
Control Delay	29.7	8.5	21.4	2.6	57.0	104.1	56.9
Queue Delay	0.0	2.2	0.0	0.1	0.0	17.6	16.8
Total Delay	29.7	10.8	21.4	2.8	57.0	121.8	73.7
Queue Length 50th (ft)	21	156	160	12	390	~523	423
Queue Length 95th (ft)	m42	141	255	m15	#627	#771	#692
Internal Link Dist (ft)		236	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	760	639	621	702
Starvation Cap Reductn	0	1093	0	41	0	0	0
Spillback Cap Reductn	0	171	0	0	0	22	41
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.66	0.84	0.52	0.95	1.17	1.04

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	704	1375	369	79	762	179	23	24	44	258	794
v/c Ratio	1.02	0.98	0.41	0.61	0.82	0.39	0.20	0.20	0.29	0.48	0.53
Control Delay	77.1	36.3	1.6	60.1	42.5	24.6	44.0	44.0	15.4	39.5	6.9
Queue Delay	0.0	10.1	0.2	0.0	0.3	0.0	0.0	0.0	0.0	2.0	0.0
Total Delay	77.1	46.4	1.8	60.1	42.8	24.6	44.0	44.0	15.4	41.4	6.9
Queue Length 50th (ft)	243	~345	6	49	245	67	14	16	0	136	77
Queue Length 95th (ft)	m#341	m#596	m12	#106	318	129	40	41	32	m175	m96
Internal Link Dist (ft)		866			570			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	689	1406	929	142	956	462	185	186	213	537	1509
Starvation Cap Reductn	0	59	110	0	0	0	0	0	0	155	22
Spillback Cap Reductn	0	0	0	0	19	0	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.02	0.47	0.56	0.83	0.39	0.12	0.13	0.21	0.68	0.53

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	271	571	149
v/c Ratio	0.07	0.07	0.23	0.25	0.14
Control Delay	26.3	26.0	2.7	7.8	10.1
Queue Delay	0.0	0.0	0.8	0.0	0.0
Total Delay	26.3	26.0	3.5	7.8	10.1
Queue Length 50th (ft)	14	14	0	73	43
Queue Length 95th (ft)	38	31	25	98	60
Internal Link Dist (ft)		119		820	793
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1189	2279	1042
Starvation Cap Reductn	0	0	627	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.48	0.25	0.14

Intersection Summary

1016: Powell St & Hollis St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	414	782	38	601	313	248	29	212	106
v/c Ratio	0.96	0.51	0.29	0.74	0.84	0.63	0.11	0.74	0.32
Control Delay	75.4	20.8	46.7	41.5	49.0	39.2	28.1	38.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.4	20.8	46.7	41.5	49.0	39.2	28.1	38.9	10.3
Queue Length 50th (ft)	~284	172	23	184	193	143	13	131	1
Queue Length 95th (ft)	#538	257	55	247	#324	231	30	152	40
Internal Link Dist (ft)		150		1499		367		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	432	1532	159	810	417	437	372	391	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.51	0.24	0.74	0.75	0.57	0.08	0.54	0.26

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1017: Stanford Ave & San Pablo Avenue

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	419	105	499	134	694	52	872
v/c Ratio	0.60	0.60	0.62	0.72	0.65	0.36	0.41	0.54
Control Delay	67.5	33.5	51.1	38.1	46.2	16.3	45.9	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	33.5	51.1	38.1	46.2	16.3	45.9	22.6
Queue Length 50th (ft)	83	113	65	157	83	120	32	200
Queue Length 95th (ft)	#154	157	118	196	137	195	69	320
Internal Link Dist (ft)		207		2595		1967		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	894	212	1058	301	1812	230	1605
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.47	0.50	0.47	0.45	0.38	0.23	0.54

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1018: 40th St & Horton St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	25	379	45	378	186	116	197	88
v/c Ratio	0.24	0.21	0.37	0.19	0.19	0.46	0.74	0.37
Control Delay	47.9	14.8	49.9	14.6	4.0	39.8	40.7	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	14.8	49.9	14.6	4.0	39.8	40.7	36.0
Queue Length 50th (ft)	16	56	29	45	0	69	116	50
Queue Length 95th (ft)	42	135	62	141	49	116	180	81
Internal Link Dist (ft)		246		256			893	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1830	195	1990	971	478	498	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.21	0.33	0.19	0.19	0.24	0.40	0.18

Intersection Summary

1019: 40th St & Hollis St

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	336	55	555	233	151	277	41	141	209
v/c Ratio	0.27	0.21	0.42	0.31	0.26	0.71	0.64	0.10	0.99	0.56
Control Delay	46.8	17.7	48.9	18.7	4.0	50.4	34.8	7.4	122.1	31.0
Queue Delay	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	17.7	48.9	19.5	4.6	50.4	34.8	7.4	122.1	31.0
Queue Length 50th (ft)	18	54	34	102	0	93	171	0	97	96
Queue Length 95th (ft)	46	115	71	196	51	156	209	23	#221	120
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1628	164	1769	908	266	671	596	142	538
Starvation Cap Reductn	0	0	0	860	361	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.21	0.34	0.61	0.43	0.57	0.41	0.07	0.99	0.39

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	481	128	752	247	127	38
v/c Ratio	0.04	0.27	0.67	0.34	0.70	0.34	0.25
Control Delay	47.3	18.2	57.2	8.7	42.7	7.2	36.5
Queue Delay	0.0	0.3	0.0	0.2	0.0	0.0	0.0
Total Delay	47.3	18.4	57.2	8.9	42.7	7.2	36.5
Queue Length 50th (ft)	2	90	83	19	159	0	21
Queue Length 95th (ft)	11	182	m116	m243	221	45	45
Internal Link Dist (ft)		247		271	934		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1756	210	2229	487	520	329
Starvation Cap Reductn	0	672	0	707	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.44	0.61	0.49	0.51	0.24	0.12

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	460	34	669	336	634	168	974
v/c Ratio	0.63	0.58	0.20	0.89	0.70	0.54	0.77	0.66
Control Delay	61.5	30.6	45.9	47.1	49.6	25.0	49.1	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	61.5	30.6	45.9	47.1	49.6	25.0	49.1	27.6
Queue Length 50th (ft)	44	53	17	165	108	218	105	275
Queue Length 95th (ft)	120	191	m50	#281	154	318	168	368
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	249	1038	185	802	481	1540	301	1492
Starvation Cap Reductn	0	0	0	0	0	0	0	48
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.44	0.18	0.83	0.70	0.54	0.56	0.69

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	437	82	659	240	394
v/c Ratio	0.28	0.23	0.44	0.32	0.40	0.73
Control Delay	16.3	8.7	26.3	7.0	16.0	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	8.7	26.3	7.0	16.0	26.0
Queue Length 50th (ft)	18	81	23	31	25	51
Queue Length 95th (ft)	m30	112	55	96	51	#104
Internal Link Dist (ft)		418		1102	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1923	212	2045	617	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.23	0.39	0.32	0.39	0.71

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	128	93	169	19	426	264
v/c Ratio	0.61	0.32	0.59	0.07	0.50	0.32
Control Delay	17.8	8.9	17.1	9.5	12.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	8.9	17.1	9.3	12.3	10.1
Queue Length 50th (ft)	23	5	31	0	70	36
Queue Length 95th (ft)	85	42	104	14	197	111
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	641	645	650	554	1006	1081
Starvation Cap Reductn	0	0	0	0	23	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.26	0.03	0.40	0.24

Intersection Summary

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	279	407	1156	1109
v/c Ratio	0.77	0.74	0.55	0.53
Control Delay	54.3	46.4	14.6	14.2
Queue Delay	0.0	0.0	0.3	0.0
Total Delay	54.3	46.4	14.9	14.2
Queue Length 50th (ft)	94	136	258	229
Queue Length 95th (ft)	#144	185	312	293
Internal Link Dist (ft)	2	922	9	798
Turn Bay Length (ft)				
Base Capacity (vph)	380	681	2085	2079
Starvation Cap Reductn	0	0	367	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.65	0.67	0.53

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	653	756	572	1067
v/c Ratio	0.43	0.98	0.32	0.36
Control Delay	24.8	49.2	12.9	13.3
Queue Delay	0.0	0.0	2.1	0.0
Total Delay	24.8	49.2	14.9	13.3
Queue Length 50th (ft)	136	330	99	183
Queue Length 95th (ft)	184	#597	133	164
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1902	769	1796	2795
Starvation Cap Reductn	0	0	1041	0
Spillback Cap Reductn	14	0	0	66
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.98	0.78	0.39

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	462	610	457	632
v/c Ratio	0.69	0.38	0.75	0.26
Control Delay	25.3	13.6	34.4	4.6
Queue Delay	0.0	0.0	0.0	0.5
Total Delay	25.3	13.6	34.4	5.2
Queue Length 50th (ft)	93	84	96	45
Queue Length 95th (ft)	130	136	#143	76
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1613	636	2482
Starvation Cap Reductn	0	0	0	1346
Spillback Cap Reductn	35	26	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.39	0.72	0.57

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	305	1023	146	974	204	619	146	333	509
v/c Ratio	0.90	0.81	0.72	0.96	0.63	0.96	0.43	0.92	0.84
Control Delay	67.1	36.9	59.7	46.4	49.5	65.8	42.7	70.3	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	36.9	59.7	46.4	49.5	65.8	42.7	70.3	24.0
Queue Length 50th (ft)	210	338	100	~390	143	224	91	231	90
Queue Length 95th (ft)	#361	427	m105	m#416	m182	m#297	154	#396	#275
Internal Link Dist (ft)		1600		1299		973		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1269	225	1010	322	646	354	373	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.81	0.65	0.96	0.63	0.96	0.41	0.89	0.83

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	942	927	284	1295	196	1265
v/c Ratio	1.38	0.62	0.88	1.04	1.16	0.81	1.20
Control Delay	225.5	25.7	38.7	110.4	116.8	72.2	135.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	225.5	25.7	38.7	110.4	116.8	72.2	135.3
Queue Length 50th (ft)	~199	314	300	~217	~570	196	~570
Queue Length 95th (ft)	m#273	m374	#433	#386	#709	#257	#708
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	151	1517	1054	274	1117	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.62	0.88	1.04	1.16	0.81	1.20

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	167	89	216	351	872	94	394
v/c Ratio	0.89	0.16	0.55	0.56	1.04	0.27	0.38
Control Delay	71.1	16.6	28.8	17.4	59.3	9.5	7.3
Queue Delay	0.0	0.0	3.0	2.6	11.0	0.0	0.0
Total Delay	71.1	16.6	31.8	20.0	70.2	9.5	7.3
Queue Length 50th (ft)	80	29	76	67	~314	13	56
Queue Length 95th (ft)	#166	53	#152	149	#539	28	102
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	187	560	393	628	842	342	1086
Starvation Cap Reductn	0	0	96	169	0	0	0
Spillback Cap Reductn	0	0	0	0	24	6	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.16	0.73	0.76	1.07	0.28	0.36

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	510	35	447	141
v/c Ratio	0.38	0.09	0.33	0.64
Control Delay	1.6	3.7	4.2	20.6
Queue Delay	2.3	0.0	0.1	0.0
Total Delay	3.8	3.7	4.3	20.6
Queue Length 50th (ft)	8	3	42	42
Queue Length 95th (ft)	m10	12	96	83
Internal Link Dist (ft)	114		863	743
Turn Bay Length (ft)				
Base Capacity (vph)	1347	409	1352	770
Starvation Cap Reductn	677	0	0	0
Spillback Cap Reductn	0	0	236	2
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.09	0.40	0.18

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	553	203	172	738	20	584
v/c Ratio	1.32	0.43	0.78	0.79	0.12	0.87
Control Delay	181.4	18.5	44.3	20.0	22.7	28.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.4	18.5	44.3	20.0	22.7	28.8
Queue Length 50th (ft)	~243	50	56	205	6	136
Queue Length 95th (ft)	#409	101	m#128	#476	m14	m#257
Internal Link Dist (ft)	663	1768		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	420	468	226	972	225	674
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.43	0.76	0.76	0.09	0.87

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	480	454	144	483	379	763
v/c Ratio	0.17	0.55	0.64	0.61	0.86	0.36	0.48	0.61
Control Delay	50.5	18.4	11.2	10.2	48.2	20.2	10.6	29.4
Queue Delay	0.8	1.6	5.9	4.1	0.0	0.7	0.9	0.1
Total Delay	51.3	20.0	17.1	14.3	48.2	21.0	11.5	29.5
Queue Length 50th (ft)	12	3	117	101	69	71	55	222
Queue Length 95th (ft)	35	55	187	m167	m69	m67	m19	287
Internal Link Dist (ft)	128			355		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	215	754	746	184	1358	791	1253
Starvation Cap Reductn	0	0	36	35	0	538	190	0
Spillback Cap Reductn	48	39	215	212	0	0	22	42
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.56	0.89	0.85	0.86	0.69	0.63	0.63

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	361	39	471	743	280	464
v/c Ratio	0.98	0.06	0.66	0.57	0.33	0.83
Control Delay	39.0	2.1	31.5	4.4	23.0	27.3
Queue Delay	1.3	0.0	0.0	0.4	0.0	0.0
Total Delay	40.3	2.1	31.5	4.8	23.0	27.3
Queue Length 50th (ft)	298	0	97	11	130	145
Queue Length 95th (ft)	#377	m2	120	461	222	277
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	962	1155	1296	842	601
Starvation Cap Reductn	24	0	0	175	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.04	0.41	0.66	0.33	0.77

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

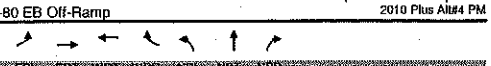
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	369	63	361	376	12	738	1678	283	642
v/c Ratio	0.61	1.25	0.22	0.86	0.91	0.14	0.91	1.06	0.96	0.80
Control Delay	48.2	172.0	28.9	51.3	54.3	47.7	48.8	45.4	51.2	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	172.0	28.9	51.3	54.3	47.7	48.8	45.4	51.2	32.9
Queue Length 50th (ft)	109	~322	23	229	241	7	241	~126	171	318
Queue Length 95th (ft)	#193	#506	62	#394	#417	26	#353	#388	#294	#615
Internal Link Dist (ft)		765			94		715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	296	311	282	441	443	235	846	1583	377	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.25	0.22	0.82	0.85	0.05	0.87	1.06	0.75	0.80

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	147	1029	1439	1284	1075	347
v/c Ratio	0.46	0.47	1.12d	0.92	0.96	0.50
Control Delay	45.4	5.4	41.7	22.9	55.2	10.4
Queue Delay	0.0	0.0	246.2	0.0	4.6	0.0
Total Delay	45.4	5.4	286.8	22.9	59.8	10.4
Queue Length 50th (ft)	94	71	~502	758	380	42
Queue Length 95th (ft)	158	114	m374	m529	#519	124
Internal Link Dist (ft)		818	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2176	1284	1399	1124	694
Starvation Cap Reductn	0	0	483	0	0	0
Spillback Cap Reductn	0	6	0	0	35	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	1.60	0.92	0.99	0.50

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
d Defacto Right Lane. Recode with 1 though lane as a right lane.

1013: Powell St & I-80 EB Off-Ramp



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	149	1347	2123	457	601	862	624
v/c Ratio	0.44	0.90	1.26	0.60	1.06	1.45	1.82
Control Delay	64.5	17.2	148.4	5.7	92.1	238.8	405.0
Queue Delay	0.0	44.5	216.2	0.4	35.3	31.0	76.9
Total Delay	64.5	61.8	366.6	6.1	125.4	269.7	483.9
Queue Length 50th (ft)	109	62	~745	25	~493	~851	~1135
Queue Length 95th (ft)	m131	m94	m#716	m22	#723	#1118	#1111
Internal Link Dist (ft)		238	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	761	565	594	342
Starvation Cap Reductn	0	155	104	60	0	0	0
Spillback Cap Reductn	0	250	470	0	41	27	30
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	1.10	1.74	0.66	1.15	1.52	2.00

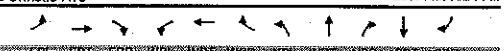
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

1014: Powell St & Christie Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	702	1123	772	342	1236	316	76	80	69	511	1092
v/c Ratio	1.32	1.11	1.10	1.25	1.16	0.62	0.36	0.37	0.28	1.04	0.90
Control Delay	189.1	89.0	70.7	174.2	119.6	36.1	50.0	50.4	25.1	85.9	21.0
Queue Delay	0.0	23.7	11.8	0.0	338.2	0.0	0.0	0.0	0.0	97.9	34.6
Total Delay	189.1	112.7	82.1	174.2	457.9	36.1	50.0	50.4	25.1	183.8	55.6
Queue Length 50th (ft)	~338	~492	489	~296	~533	184	61	64	19	~392	174
Queue Length 95th (ft)	m#268	m354	m238	#494	#697	296	113	118	66	#607	#362
Internal Link Dist (ft)		365			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1012	701	274	1062	510	214	217	262	492	1209
Starvation Cap Reductn	0	48	17	0	0	0	0	0	0	92	38
Spillback Cap Reductn	0	0	0	0	416	0	0	0	0	0	188
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	1.16	1.13	1.25	1.92	0.62	0.36	0.37	0.28	1.28	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

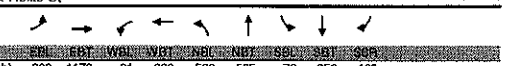
m Volume for 95th percentile queue is metered by upstream signal.

1015: Christie Ave & Shellmound St

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	94	197	867	1215	318
v/c Ratio	0.17	0.17	0.47	0.59	0.52
Control Delay	33.1	31.9	9.7	15.8	40.3
Queue Delay	2.3	1.3	0.5	0.0	0.0
Total Delay	35.3	33.2	10.2	15.8	40.3
Queue Length 50th (ft)	61	64	98	286	250
Queue Length 95th (ft)	118	104	157	330	329
Internal Link Dist (ft)		140		820	739
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1146	1864	2069	610
Starvation Cap Reductn	352	752	541	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.50	0.66	0.59	0.52

Intersection Summary

1016: Powell St & Hollis St



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	1170	21	820	560	565	72	256	160
v/c Ratio	1.24	1.13	0.23	1.12	0.93	0.80	0.24	0.80	0.40
Control Delay	196.6	102.1	55.4	111.1	43.7	41.2	47.3	54.1	15.9
Queue Delay	0.0	0.0	0.0	0.0	7.0	7.6	0.0	0.0	0.0
Total Delay	196.6	102.1	55.4	111.1	50.7	48.9	47.3	54.1	15.9
Queue Length 50th (ft)	~181	~258	15	~350	341	333	51	187	13
Queue Length 95th (ft)	#330	#684	41	#476	#628	#614	100	273	86
Internal Link Dist (ft)		159		1493		667		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	1037	97	735	677	707	499	625	649
Starvation Cap Reductn	0	0	0	0	83	108	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	1.13	0.22	1.12	0.94	0.94	0.14	0.49	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	924	107	581	188	1408	116	1256
v/c Ratio	0.89	0.93	0.64	0.60	0.80	1.10	0.67	1.08
Control Delay	69.8	47.0	49.4	31.8	55.8	85.9	52.2	81.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	47.0	49.4	31.8	55.8	85.9	52.2	81.5
Queue Length 50th (ft)	90	260	59	146	104	~528	65	~486
Queue Length 95th (ft)	#194	#386	112	201	#203	#665	#131	#603
Internal Link Dist (ft)		207		2535		1957		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	996	197	977	256	1284	197	1166
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.93	0.54	0.59	0.73	1.10	0.60	1.08

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	27	965	84	715	58	255	270	313
v/c Ratio	0.26	0.72	0.58	0.47	0.08	0.79	0.78	0.84
Control Delay	48.8	32.4	58.8	25.9	8.4	42.3	35.6	43.2
Queue Delay	0.0	4.3	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	48.8	36.7	58.8	26.4	8.4	42.3	35.6	43.2
Queue Length 50th (ft)	17	271	62	178	0	168	199	191
Queue Length 95th (ft)	44	#509	#127	#332	32	221	206	266
Internal Link Dist (ft)		246		256			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	1340	152	1518	693	478	491	494
Starvation Cap Reductn	0	294	0	385	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.92	0.55	0.69	0.08	0.53	0.55	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	855	148	614	246	226	348	140	306	513
v/c Ratio	0.99	0.77	0.74	0.43	0.33	1.07	0.65	0.26	1.44	0.98
Control Delay	46.8	35.8	56.0	24.4	4.5	124.0	37.7	6.0	254.5	62.1
Queue Delay	0.0	8.6	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	44.5	56.0	25.6	4.9	124.0	37.7	6.0	254.5	62.1
Queue Length 50th (ft)	30	257	91	157	0	~160	193	0	~269	323
Queue Length 95th (ft)	64	335	#168	220	53	#308	291	44	#445	#497
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	105	1114	290	1413	744	212	540	540	212	533
Starvation Cap Reductn	0	228	0	536	190	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.97	0.64	0.70	0.44	1.07	0.64	0.26	1.44	0.96

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	1190	166	980	336	301	193
v/c Ratio	0.18	0.97	0.75	0.66	0.87	0.56	0.72
Control Delay	39.9	52.7	49.7	20.3	48.4	9.2	45.1
Queue Delay	0.0	102.1	0.0	0.7	0.0	1.7	3.0
Total Delay	39.9	154.7	49.7	21.1	48.4	10.9	48.1
Queue Length 50th (ft)	18	~385	103	134	205	17	116
Queue Length 95th (ft)	46	#688	m57	m274	#319	89	181
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	246	1233	301	1445	462	586	349
Starvation Cap Reductn	0	272	0	188	0	0	0
Spillback Cap Reductn	0	207	0	0	0	151	80
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.24	0.55	0.78	0.74	0.89	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	1139	49	710	523	1282	281	1343
v/c Ratio	0.92	1.12	0.51	1.05	1.17	0.98	1.08	1.00
Control Delay	48.1	91.3	59.7	82.2	138.7	52.7	123.1	55.0
Queue Delay	0.0	15.3	0.0	0.0	39.2	0.0	0.0	15.0
Total Delay	48.1	106.5	59.7	82.2	177.9	52.7	123.1	68.0
Queue Length 50th (ft)	112	~410	32	~250	~206	418	~210	~455
Queue Length 95th (ft)	m#113	m#445	m67	#344	#309	#576	#370	#612
Internal Link Dist (ft)		271		416		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1014	106	679	446	1307	259	1349
Starvation Cap Reductn	0	31	0	0	0	0	0	57
Spillback Cap Reductn	0	0	0	0	52	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.16	0.46	1.05	1.28	0.98	1.08	1.04

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	896	47	713	440	450
v/c Ratio	0.14	0.45	0.26	0.34	0.68	0.83
Control Delay	20.7	9.5	22.0	5.9	19.6	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	9.5	22.0	5.9	19.6	28.2
Queue Length 50th (ft)	9	130	13	36	50	51
Queue Length 95th (ft)	m9	m140	36	103	88	#117
Internal Link Dist (ft)		418		1182	822	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1993	246	2119	691	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.45	0.19	0.34	0.64	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	245	157	127	26	566	513
v/c Ratio	0.76	0.45	0.50	0.12	0.76	0.66
Control Delay	25.7	18.2	27.2	11.4	24.6	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	25.7	18.2	27.2	11.4	25.1	15.7
Queue Length 50th (ft)	84	39	44	0	157	122
Queue Length 95th (ft)	162	91	100	20	#444	294
Internal Link Dist (ft)		500	95		266	834
Turn Bay Length (ft)						
Base Capacity (vph)	567	586	536	493	745	924
Starvation Cap Reductn	0	0	0	0	36	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.27	0.24	0.05	0.80	0.56

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	501	392	1617	1704
v/c Ratio	1.08	0.74	0.82	0.86
Control Delay	107.2	47.0	23.4	25.8
Queue Delay	0.0	0.0	2.9	0.0
Total Delay	107.2	47.0	26.3	25.8
Queue Length 50th (ft)	~197	129	445	492
Queue Length 95th (ft)	#306	180	566	627
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	463	596	1974	1974
Starvation Cap Reductn	0	0	250	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.66	0.94	0.86

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	472	771	1110	1639
v/c Ratio	0.45	1.40	0.67	0.53
Control Delay	27.1	214.5	14.1	10.8
Queue Delay	0.3	0.0	34.4	0.4
Total Delay	27.4	214.5	48.5	11.2
Queue Length 50th (ft)	113	~550	200	178
Queue Length 95th (ft)	159	#773	269	215
Internal Link Dist (ft)	983		192	896
Turn Bay Length (ft)		70		
Base Capacity (vph)	1054	552	1654	3103
Starvation Cap Reductn	0	0	609	0
Spillback Cap Reductn	168	0	0	790
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	1.40	1.06	0.71

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	NBT	SBL	SBT
Lane Group Flow (vph)	851	1105	788	935
v/c Ratio	0.96	0.83	0.88	0.39
Control Delay	61.0	36.2	46.6	8.6
Queue Delay	27.8	55.1	145.2	5.6
Total Delay	88.7	93.3	191.8	14.2
Queue Length 50th (ft)	306	376	269	139
Queue Length 95th (ft)	#437	#504	341	175
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	894	1327	967	2384
Starvation Cap Reductn	0	0	370	1375
Spillback Cap Reductn	92	337	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.06	1.12	1.32	0.93

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	120	64	233	172	853	90	581
v/c Ratio	0.35	0.12	0.60	0.30	1.00	0.29	0.55
Control Delay	21.6	14.6	29.1	11.6	49.0	7.5	9.5
Queue Delay	0.0	0.0	40.4	2.2	39.2	0.1	0.0
Total Delay	21.6	14.6	69.5	13.8	88.2	7.6	9.5
Queue Length 50th (ft)	35	14	79	23	272	12	104
Queue Length 95th (ft)	77	39	#163	68	#519	27	173
Internal Link Dist (ft)		493		63	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	340	539	391	670	853	313	1110
Starvation Cap Reductn	0	0	166	279	0	0	0
Spillback Cap Reductn	0	0	0	0	85	18	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.12	1.04	0.59	1.11	0.31	0.52

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	SBT	WBL	WBT	NBL
Lane Group Flow (vph)	185	42	172	79
v/c Ratio	0.13	0.22	0.11	0.34
Control Delay	4.2	25.8	2.4	20.6
Queue Delay	0.8	0.0	0.0	0.0
Total Delay	5.0	25.8	2.4	20.6
Queue Length 50th (ft)	7	14	12	22
Queue Length 95th (ft)	m40	39	31	53
Internal Link Dist (ft)	63		854	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1384	236	1553	501
Starvation Cap Reductn	943	0	0	0
Spillback Cap Reductn	0	0	980	44
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.18	0.15	0.14

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1009: Shellmound Way & Christie Ave — 2010 Plus Alt#4 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	587	547	184	496	576	697
v/c Ratio	0.14	0.38	0.98	0.93	1.31	0.45	0.73	0.69
Control Delay	35.6	26.1	53.6	42.0	168.2	12.9	9.9	38.8
Queue Delay	0.1	4.7	116.2	91.8	0.0	1.4	31.5	1.0
Total Delay	35.6	30.8	169.9	133.8	168.2	14.2	41.3	37.8
Queue Length 50th (ft)	39	66	436	398	~149	47	110	223
Queue Length 95th (ft)	69	116	#695	#628	m#147	m47	m72	291
Internal Link Dist (ft)	198			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	394	596	589	125	1110	784	1014
Starvation Cap Reductn	0	0	90	89	0	402	232	0
Spillback Cap Reductn	46	181	199	137	0	0	143	124
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.69	1.26	1.21	1.31	0.70	1.04	0.78

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St — 2010 Plus Alt#4 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	532	78	712	1014	315	439
v/c Ratio	1.07	0.08	0.85	0.84	0.46	0.40
Control Delay	78.2	0.9	24.2	33.5	30.9	8.2
Queue Delay	48.2	0.0	0.3	13.9	0.0	0.0
Total Delay	126.4	0.9	24.4	47.4	30.9	8.3
Queue Length 50th (ft)	~420	0	236	768	169	99
Queue Length 95th (ft)	#632	m4	m231	m842	280	194
Internal Link Dist (ft)	942			793	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1077	1186	1202	683	1106
Starvation Cap Reductn	50	0	0	191	0	0
Spillback Cap Reductn	0	0	104	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.07	0.68	1.00	0.46	0.40

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd — 2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	569	552	45	329	1415	147	514
v/c Ratio	0.21	0.17	0.06	0.91	0.88	0.31	0.34	0.89	0.63	0.79
Control Delay	35.8	35.6	20.7	48.2	44.1	35.5	23.7	9.5	32.8	29.9
Queue Delay	0.0	0.0	0.0	20.5	18.7	0.0	0.0	0.0	0.0	6.3
Total Delay	35.8	35.8	20.7	68.7	57.8	35.5	23.7	9.5	32.8	36.3
Queue Length 50th (ft)	13	11	0	~329	~309	21	66	0	69	227
Queue Length 95th (ft)	39	34	13	#571	#553	54	115	#63	126	#432
Internal Link Dist (ft)		786				24		260		241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	932	949	303	623	624	316	1108	1583	444	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	52	69	88	0	0	0	0	157
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.07	0.03	1.03	0.99	0.14	0.30	0.89	0.33	0.91

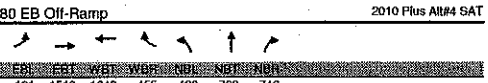
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd — 2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	123	306	917	1150	1329	263
v/c Ratio	0.69	0.17	0.72	0.82	0.92	0.34
Control Delay	51.4	15.9	25.1	21.6	35.1	6.0
Queue Delay	0.0	0.0	29.0	0.0	89.1	0.0
Total Delay	51.4	15.9	54.2	21.6	123.2	6.0
Queue Length 50th (ft)	85	61	309	691	437	25
Queue Length 95th (ft)	141	93	m320	m707	508	73
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1789	1270	1399	1568	842
Starvation Cap Reductn	0	0	393	0	353	0
Spillback Cap Reductn	0	0	0	0	478	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.17	1.05	0.82	1.19	0.31

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2010 Plus Alt#4 SAT



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	121	1513	1648	455	420	768	746
v/c Ratio	0.79	1.26	0.90	0.56	0.57	0.97	1.01
Control Delay	67.5	146.9	47.8	4.8	27.1	45.5	441.3
Queue Delay	0.0	117.7	52.1	0.2	0.7	3.7	18.7
Total Delay	67.5	264.6	99.9	5.0	27.8	49.2	457.0
Queue Length 50th (ft)	73	~461	430	18	229	412	~916
Queue Length 95th (ft)	m98	#609	#614	m41	336	#726	#1316
Internal Link Dist (ft)		215	365			1448	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1674	817	734	792	390
Starvation Cap Reductn	0	206	98	55	0	0	0
Spillback Cap Reductn	0	79	214	0	100	16	7
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.53	1.13	0.60	0.66	0.99	1.95

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	920	1451	734	380	726	332	153	161	110	618	1124
v/c Ratio	1.38	1.31	1.21	1.39	0.68	0.61	0.84	0.86	0.42	1.25	0.86
Control Delay	214.6	170.8	117.3	231.4	37.8	24.9	91.5	93.8	26.5	154.2	21.3
Queue Delay	0.0	15.8	2.8	0.0	0.8	0.2	0.0	0.0	0.0	118.4	45.4
Total Delay	214.6	186.6	120.0	231.4	38.6	25.0	91.5	93.8	26.5	272.6	66.6
Queue Length 50th (ft)	~395	~668	~597	~358	207	121	121	127	25	~539	170
Queue Length 95th (ft)	m#260	m#376	m192	#545	304	219	m#235	m#249	m69	m#656	m311
Internal Link Dist (ft)		365					570		520		295
Turn Bay Length (ft)	400			200			55	120			
Base Capacity (vph)	593	1106	606	274	1062	548	183	188	261	495	1300
Starvation Cap Reductn	0	29	3	0	0	0	0	0	0	87	273
Spillback Cap Reductn	0	0	0	0	115	17	0	0	0	0	183
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	1.35	1.22	1.39	0.77	0.63	0.84	0.86	0.42	1.51	1.09

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	138	292	1243	1713	396
v/c Ratio	0.21	0.22	0.89	0.92	0.46
Control Delay	23.4	23.0	31.9	20.6	12.6
Queue Delay	1.2	0.7	5.6	1.3	0.0
Total Delay	24.6	23.7	37.5	21.9	12.6
Queue Length 50th (ft)	76	82	336	615	227
Queue Length 95th (ft)	127	114	#540	#757	333
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1869	855
Starvation Cap Reductn	338	732	129	0	0
Spillback Cap Reductn	161	336	0	50	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.97	0.94	0.46

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

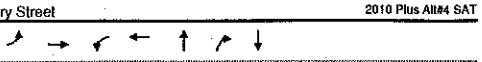
Queues
1016: Powell St & Hollis Street
2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	93	1050	41	855	309	262	39	250	103
v/c Ratio	0.62	0.92	0.39	0.95	0.78	0.63	0.11	0.86	0.26
Control Delay	84.9	38.0	41.4	46.9	34.5	27.7	21.3	28.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.9	38.0	41.4	46.9	34.5	27.7	21.3	28.7	6.7
Queue Length 50th (ft)	38	~242	16	180	114	90	13	92	0
Queue Length 95th (ft)	#120	#374	#46	#315	#230	166	35	160	34
Internal Link Dist (ft)		922		1493		3634		2671	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	113	1138	107	900	437	457	428	450	452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.92	0.38	0.95	0.71	0.57	0.09	0.56	0.23

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street

2010 Plus Alt#4 SAT



Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBT
Lane Group Flow (vph)	20	1307	190	1246	226	237	60
v/c Ratio	0.32	0.81	1.19	0.62	0.75	0.52	0.24
Control Delay	62.4	23.0	137.2	15.7	43.0	6.8	27.9
Queue Delay	0.0	56.4	0.0	6.9	0.0	0.1	0.0
Total Delay	62.4	79.4	137.2	21.5	43.0	7.0	27.9
Queue Length 50th (ft)	13	92	~143	65	140	0	28
Queue Length 95th (ft)	m24	#734	m#151	m#468	200	59	55
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1621	159	2004	441	560	446
Starvation Cap Reductn	0	0	0	695	0	0	0
Spillback Cap Reductn	0	451	0	0	0	31	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.12	1.19	0.95	0.51	0.45	0.14

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue

2010 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	1174	78	698	622	1015	160	1217
v/c Ratio	0.81	1.06	0.76	0.64	1.13	0.82	0.78	1.16
Control Delay	62.6	55.2	84.2	45.7	119.9	36.3	57.0	114.3
Queue Delay	0.0	22.7	0.0	6.0	76.6	0.0	0.0	0.5
Total Delay	62.6	77.9	84.2	51.8	196.5	36.3	57.0	114.8
Queue Length 50th (ft)	89	~428	50	221	~298	312	99	~481
Queue Length 95th (ft)	m162	#526	#128	#323	#348	#410	#184	#616
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1112	106	833	549	1243	239	1051
Starvation Cap Reductn	0	56	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	74	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	1.11	0.74	0.95	1.31	0.82	0.67	1.16

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

SYNCHRO QUEUE SHEETS
ALTERNATIVE #4
2030

Queues
1001: Ashby (SR 13) & Seventh St

Marketplace Redevelopment
2030 Plus Alt#4 AM

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	607	1327	124	881	131	354	72	298	214
v/c Ratio	1.08	0.85	0.70	1.07	0.57	0.76	0.24	0.93	0.48
Control Delay	97.5	32.0	46.0	82.3	51.9	50.0	41.6	80.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	32.0	46.0	82.3	51.9	50.0	41.6	80.2	9.3
Queue Length 50th (ft)	~479	421	81	~581	87	118	44	210	0
Queue Length 95th (ft)	#697	#542	m84	m#406	150	169	88	#373	65
Internal Link Dist (ft)		1600		1299		873		1945	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	563	1570	193	825	267	520	306	322	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.85	0.64	1.07	0.51	0.69	0.24	0.93	0.48

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	941	914	229	943	125	1130
v/c Ratio	0.89	0.62	1.00	0.91	0.87	0.49	1.04
Control Delay	41.1	10.2	60.5	81.2	45.4	50.4	74.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	10.2	60.5	81.2	45.4	50.4	74.3
Queue Length 50th (ft)	19	66	324	161	326	82	~452
Queue Length 95th (ft)	m#39	97	#477	#302	#436	143	#587
Internal Link Dist (ft)		1299	1505		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	155	1521	914	257	1085	257	1090
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.62	1.00	0.89	0.87	0.49	1.04

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	69	69	161	283	255	126	682
v/c Ratio	0.17	0.08	0.27	0.33	0.54	0.27	0.88
Control Delay	14.4	12.0	10.4	2.5	17.7	10.5	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	12.0	11.2	3.1	17.7	10.5	18.3
Queue Length 50th (ft)	14	13	21	0	66	27	201
Queue Length 95th (ft)	46	40	73	21	112	42	262
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	402	833	599	864	589	465	992
Starvation Cap Reductn	0	0	237	296	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.08	0.45	0.50	0.43	0.26	0.69

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	282	53	266	193
v/c Ratio	0.20	0.07	0.19	0.63
Control Delay	4.0	4.1	4.1	22.2
Queue Delay	0.4	0.0	0.0	0.0
Total Delay	4.4	4.1	4.1	22.2
Queue Length 50th (ft)	25	5	26	63
Queue Length 95th (ft)	76	17	63	109
Internal Link Dist (ft)	114		663	749
Turn Bay Length (ft)				
Base Capacity (vph)	1300	736	1395	784
Starvation Cap Reductn	693	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.07	0.19	0.25

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	161	38	371	24	694
v/c Ratio	0.87	0.53	0.19	0.33	0.14	0.68
Control Delay	43.9	25.0	18.7	8.1	20.9	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	25.0	18.7	8.1	20.9	15.9
Queue Length 50th (ft)	70	42	11	35	7	88
Queue Length 95th (ft)	#194	#90	27	157	23	#364
Internal Link Dist (ft)	683	1768		676		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	363	303	283	1109	283	1015
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.53	0.13	0.33	0.08	0.68

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	70	123	289	269	63	276	349	418
v/c Ratio	0.65	0.59	1.07	0.99	0.10	0.12	0.30	0.19
Control Delay	72.9	20.3	126.8	105.3	0.8	0.6	1.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	72.9	20.3	126.8	105.3	0.8	0.6	2.1	6.8
Queue Length 50th (ft)	45	0	222	186	1	2	12	48
Queue Length 95th (ft)	#112	56	#391	#352	m1	m2	67	69
Internal Link Dist (ft)	75			935		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	109	211	269	272	618	2339	1164	2186
Starvation Cap Reductn	0	0	0	0	0	0	439	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.58	1.07	0.99	0.10	0.12	0.48	0.19

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	309	40	300	260	155	309
v/c Ratio	0.88	0.07	0.78	0.19	0.15	0.55
Control Delay	61.7	20.8	35.6	1.8	11.6	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	20.8	35.6	1.8	11.6	7.7
Queue Length 50th (ft)	213	9	84	4	45	0
Queue Length 95th (ft)	#345	m41	129	6	84	70
Internal Link Dist (ft)	335			733	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	372	953	1236	1344	1054	577
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.04	0.24	0.19	0.15	0.54

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	22	17	429	452	93	113	1044	50	361
v/c Ratio	0.04	0.16	0.13	0.64	0.66	0.47	0.11	0.66	0.44	0.75
Control Delay	35.8	36.0	18.1	28.2	29.0	34.2	19.4	2.2	34.1	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	36.0	18.1	28.2	29.0	34.2	19.4	2.2	34.1	26.5
Queue Length 50th (ft)	2	10	0	174	187	40	20	0	25	143
Queue Length 95th (ft)	14	35	20	#410	#438	53	41	0	83	256
Internal Link Dist (ft)		785				24		715		241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	348	366	325	673	691	348	1228	1583	441	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.05	0.64	0.65	0.27	0.09	0.66	0.18	0.53

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	470	822	1199	936	151
v/c Ratio	0.30	0.23	0.86	0.83	0.86	0.25
Control Delay	39.1	5.6	19.2	16.8	34.2	4.2
Queue Delay	0.0	0.0	1.6	0.0	0.1	0.0
Total Delay	39.1	5.6	20.8	16.8	34.3	4.2
Queue Length 50th (ft)	71	33	104	668	286	0
Queue Length 95th (ft)	126	69	m223	m726	319	38
Internal Link Dist (ft)		618	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	936	2089	1254	1441	1375	724
Starvation Cap Reductn	0	0	255	0	0	0
Spillback Cap Reductn	0	1	0	0	27	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.23	0.82	0.83	0.70	0.21

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	86	1097	1341	431	649	753	739
v/c Ratio	0.27	0.46	0.90	0.54	1.02	1.21	1.05
Control Delay	29.0	8.9	25.3	2.8	71.8	135.3	75.1
Queue Delay	0.0	2.1	0.0	0.2	0.0	45.7	67.1
Total Delay	29.0	11.0	25.3	3.0	71.8	181.0	142.2
Queue Length 50th (ft)	22	160	195	15	~444	~597	~526
Queue Length 95th (ft)	m48	146	m#357	m13	#689	#850	#765
Internal Link Dist (ft)		236	365			1448	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	319	2390	1484	800	639	622	703
Starvation Cap Reductn	0	1100	0	45	0	0	0
Spillback Cap Reductn	0	270	0	0	0	49	94
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.85	0.90	0.57	1.02	1.91	1.21

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	494	1601	334	75	849	171	22	23	42	247	804
v/c Ratio	0.72	1.14	0.37	0.59	0.88	0.37	0.19	0.19	0.28	0.46	0.53
Control Delay	45.0	90.7	1.6	58.4	47.2	24.9	43.9	44.0	15.4	40.4	8.1
Queue Delay	0.0	12.0	0.2	0.0	3.6	0.0	0.0	0.0	0.0	1.8	0.0
Total Delay	45.0	102.7	1.8	58.4	50.6	24.9	43.9	44.0	15.4	42.1	8.1
Queue Length 50th (ft)	156	~658	0	47	271	65	14	14	0	131	99
Queue Length 95th (ft)	m180	m#714	m14	#95	#378	126	38	40	32	m153	m106
Internal Link Dist (ft)		365			670			520		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	687	1404	897	142	956	458	185	186	212	537	1508
Starvation Cap Reductn	0	33	128	0	0	0	0	0	0	159	24
Spillback Cap Reductn	0	0	0	0	59	0	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.17	0.43	0.53	0.94	0.37	0.12	0.12	0.20	0.65	0.64

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	29	60	233	578	197
v/c Ratio	0.07	0.07	0.20	0.25	0.19
Control Delay	27.0	26.6	3.1	7.8	12.6
Queue Delay	0.0	0.0	0.7	0.0	0.0
Total Delay	27.0	26.6	3.8	7.8	12.6
Queue Length 50th (ft)	15	14	0	74	56
Queue Length 95th (ft)	38	31	25	99	110
Internal Link Dist (ft)		119		820	793
Turn Bay Length (ft)	200				
Base Capacity (vph)	443	910	1165	2270	1042
Starvation Cap Reductn	0	0	641	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.44	0.25	0.19

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	426	859	38	651	355	313	32	306	115
v/c Ratio	1.20	0.62	0.29	0.80	0.91	0.77	0.09	0.86	0.29
Control Delay	153.4	24.6	46.7	44.6	61.0	47.8	24.6	45.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	153.4	24.6	46.7	44.6	61.0	47.8	24.6	45.3	10.2
Queue Length 50th (ft)	~368	219	23	203	232	196	12	159	9
Queue Length 95th (ft)	#556	294	55	#272	#393	#310	m26	#305	44
Internal Link Dist (ft)		150		1493		387		580	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	354	1391	159	810	406	427	372	391	423
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.62	0.24	0.80	0.87	0.73	0.09	0.78	0.27

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	475	111	583	132	808	52	1042
v/c Ratio	0.87	0.68	0.64	0.75	0.88	0.47	0.41	0.68
Control Delay	99.9	35.2	52.0	37.7	46.2	19.3	45.9	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	35.2	52.0	37.7	46.2	19.3	45.9	27.3
Queue Length 50th (ft)	70	194	69	184	92	172	32	267
Queue Length 95th (ft)	#171	176	124	222	136	274	69	#464
Internal Link Dist (ft)		207		2535		1367		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	124	689	212	1059	301	1735	230	1525
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.53	0.52	0.55	0.44	0.47	0.23	0.68

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	26	398	87	439	341	123	440	261
v/c Ratio	0.25	0.34	0.58	0.31	0.41	0.27	0.93	0.79
Control Delay	48.4	26.4	58.3	24.6	5.1	30.9	56.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	48.4	26.4	58.3	24.6	5.5	30.9	56.0	41.8
Queue Length 50th (ft)	16	99	53	93	0	62	265	160
Queue Length 95th (ft)	43	153	#126	180	71	110	#442	222
Internal Link Dist (ft)		246		259			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	126	1178	156	1411	836	478	500	492
Starvation Cap Reductn	0	0	0	0	170	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.34	0.56	0.31	0.51	0.26	0.88	0.53

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	445	60	811	258	151	352	42	188	280
v/c Ratio	0.27	0.29	0.44	0.48	0.29	0.71	0.75	0.10	1.32	0.71
Control Delay	46.8	20.1	49.6	21.9	4.1	50.4	36.0	7.3	221.7	33.0
Queue Delay	0.0	0.0	0.0	1.6	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	20.1	49.6	23.5	4.5	50.4	36.0	7.3	221.7	33.0
Queue Length 50th (ft)	18	99	37	187	0	93	209	0	~161	125
Queue Length 95th (ft)	46	156	76	302	53	156	270	23	#301	186
Internal Link Dist (ft)		250		214			386			421
Turn Bay Length (ft)										
Base Capacity (vph)	159	1567	165	1690	894	266	671	597	142	539
Starvation Cap Reductn	0	0	0	668	299	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.29	0.36	0.79	0.43	0.57	0.52	0.07	1.32	0.52

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	3	630	128	952	444	127	58
v/c Ratio	0.04	0.45	0.66	0.51	0.94	0.27	0.99
Control Delay	47.3	25.2	49.0	11.2	60.4	12.3	39.1
Queue Delay	0.0	0.8	0.0	0.7	0.0	0.0	0.0
Total Delay	47.3	25.9	49.0	11.9	60.4	12.3	39.1
Queue Length 50th (ft)	2	152	57	35	274	19	33
Queue Length 95th (ft)	11	244	m103	m291	#457	64	65
Internal Link Dist (ft)		247		871	934		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	71	1392	208	1867	489	491	205
Starvation Cap Reductn	0	435	0	521	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.66	0.62	0.71	0.91	0.26	0.28

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	579	34	856	391	1020	175	1136
v/c Ratio	0.83	0.54	0.24	0.86	0.81	0.70	0.78	0.92
Control Delay	69.2	34.9	49.0	46.9	56.4	34.9	49.7	44.3
Queue Delay	0.0	0.1	0.0	0.1	5.5	0.0	0.0	0.1
Total Delay	69.2	35.0	49.0	47.1	61.8	34.9	49.7	44.4
Queue Length 50th (ft)	70	84	26	214	126	309	109	360
Queue Length 95th (ft)	126	241	m51	#435	#196	#447	174	#494
Internal Link Dist (ft)		271		418		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1169	157	972	481	1286	301	1233
Starvation Cap Reductn	0	64	0	0	0	0	0	2
Spillback Cap Reductn	0	0	0	4	51	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.52	0.22	0.88	0.91	0.79	0.58	0.92

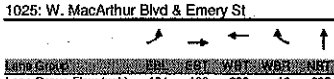
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	61	514	117	845	240	409
v/c Ratio	0.31	0.29	0.59	0.41	0.40	0.76
Control Delay	18.7	9.1	32.8	7.8	16.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	9.1	32.8	7.8	16.0	26.3
Queue Length 50th (ft)	26	61	93	43	25	52
Queue Length 95th (ft)	m39	m114	#86	130	51	#107
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	248	1785	212	2042	616	565
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.29	0.55	0.41	0.39	0.72

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	493	63	183	5	312
v/c Ratio	0.66	0.06	0.14	0.01	0.55
Control Delay	12.2	4.4	10.2	10.8	5.4
Queue Delay	0.6	0.0	0.0	0.0	0.0
Total Delay	12.2	4.4	10.2	10.8	5.4
Queue Length 50th (ft)	42	4	18	1	10
Queue Length 95th (ft)	#163	19	65	6	59
Internal Link Dist (ft)		1606	582	425	983
Turn Bay Length (ft)	105				
Base Capacity (vph)	734	1198	647	726	847
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.05	0.28	0.01	0.37

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	184	108	220	19	635	303
v/c Ratio	0.69	0.35	0.72	0.07	0.72	0.84
Control Delay	27.3	12.6	26.6	10.9	25.1	12.7
Queue Delay	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	27.3	12.6	26.6	10.9	27.2	12.7
Queue Length 50th (ft)	65	14	78	0	190	61
Queue Length 95th (ft)	135	55	154	16	#511	158
Internal Link Dist (ft)		500	95		285	834
Turn Bay Length (ft)						
Base Capacity (vph)	643	586	570	517	829	908
Starvation Cap Reductn	0	0	0	0	91	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.39	0.04	0.86	0.33

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	297	443	1378	1305
v/c Ratio	0.83	0.77	0.67	0.64
Control Delay	60.2	47.9	17.4	16.6
Queue Delay	0.0	0.0	0.7	0.0
Total Delay	60.2	47.9	18.0	16.6
Queue Length 50th (ft)	101	147	324	296
Queue Length 95th (ft)	#170	202	409	374
Internal Link Dist (ft)	2	922	2	796
Turn Bay Length (ft)				
Base Capacity (vph)	372	631	2052	2044
Starvation Cap Reductn	0	0	317	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.79	0.64

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	759	857	893	1255
v/c Ratio	0.68	1.19	0.38	0.45
Control Delay	27.5	121.6	13.7	14.1
Queue Delay	0.1	0.0	3.7	0.0
Total Delay	27.6	121.6	17.3	14.1
Queue Length 50th (ft)	201	~570	125	165
Queue Length 95th (ft)	262	#807	168	200
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1904	722	1791	2782
Starvation Cap Reductn	0	0	985	0
Spillback Cap Reductn	38	0	0	205
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	1.19	0.86	0.49

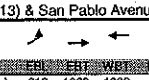
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	531	731	569	717
v/c Ratio	0.71	0.46	0.86	0.30
Control Delay	25.2	15.9	45.2	5.4
Queue Delay	0.0	0.1	0.0	0.7
Total Delay	25.2	16.0	45.2	6.1
Queue Length 50th (ft)	108	111	122	54
Queue Length 95th (ft)	146	176	#206	96
Internal Link Dist (ft)	909	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	1404	1521	836	2392
Starvation Cap Reductn	0	0	0	1246
Spillback Cap Reductn	47	78	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.51	0.68	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

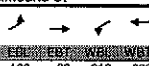
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	316	1060	156	1031	222	694	159	407	593
v/c Ratio	0.92	0.85	0.76	1.05	0.69	1.08	0.45	1.09	0.88
Control Delay	71.3	40.1	57.2	61.7	51.8	95.3	43.4	115.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	40.1	57.2	61.7	51.8	95.3	43.4	115.4	30.6
Queue Length 50th (ft)	219	357	108	~429	156	~280	99	~325	123
Queue Length 95th (ft)	#380	#476	m94	m320	m195	m#358	166	#517	#327
Internal Link Dist (ft)		1600		1999		973		1045	
Turn Bay Length (ft)	285		175				110		
Base Capacity (vph)	354	1242	225	981	322	645	364	375	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.85	0.69	1.05	0.69	1.08	0.45	1.09	0.88

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	1023	1002	294	1512	201	1413
v/c Ratio	1.68	0.67	1.12	1.07	1.35	0.83	1.34
Control Delay	351.7	26.4	99.0	120.0	197.4	74.7	193.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	351.7	26.4	99.0	120.0	197.4	74.7	193.8
Queue Length 50th (ft)	~224	343	~426	~232	~741	140	~687
Queue Length 95th (ft)	m#287	m398	#558	#402	#882	#266	#827
Internal Link Dist (ft)		1299	1605		696		1468
Turn Bay Length (ft)	125			165		120	
Base Capacity (vph)	127	1516	894	274	1116	241	1051
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.68	0.67	1.12	1.07	1.35	0.83	1.34

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	166	89	216	639	815	98	625
v/c Ratio	1.24	0.15	0.45	0.78	1.13	0.40	0.68
Control Delay	184.4	13.5	17.1	15.2	95.5	12.3	14.4
Queue Delay	0.0	0.0	1.7	4.4	4.7	1.2	0.0
Total Delay	184.4	13.6	18.8	19.5	100.2	13.5	14.4
Queue Length 50th (ft)	~81	20	48	48	~339	16	141
Queue Length 95th (ft)	#193	47	103	#269	#537	36	241
Internal Link Dist (ft)		441		114	774		287
Turn Bay Length (ft)	50		35			45	
Base Capacity (vph)	134	586	482	823	722	243	962
Starvation Cap Reductn	0	0	139	120	0	0	0
Spillback Cap Reductn	0	73	0	0	7	45	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	0.15	0.63	0.91	1.14	0.49	0.65

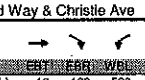
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	515	39	447	453
v/c Ratio	0.50	0.14	0.43	0.82
Control Delay	6.8	10.6	11.0	20.4
Queue Delay	2.2	0.0	0.1	0.2
Total Delay	11.0	10.6	11.1	20.7
Queue Length 50th (ft)	71	6	63	146
Queue Length 95th (ft)	m65	27	194	195
Internal Link Dist (ft)	114		663	743
Turn Bay Length (ft)				
Base Capacity (vph)	1032	281	1036	921
Starvation Cap Reductn	365	0	0	0
Spillback Cap Reductn	0	0	49	61
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.14	0.46	0.60

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	577	203	172	795	20	640
v/c Ratio	1.40	0.43	0.78	0.82	0.12	0.95
Control Delay	215.5	18.4	44.8	22.9	22.8	41.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	215.5	18.4	44.8	22.9	22.8	41.0
Queue Length 50th (ft)	~264	50	56	229	6	172
Queue Length 95th (ft)	#433	101 m#128	#523	m14	m#296	
Internal Link Dist (ft)	663	1766		675		314
Turn Bay Length (ft)			110		75	
Base Capacity (vph)	413	469	225	972	225	679
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.40	0.43	0.78	0.82	0.09	0.95

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

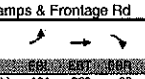


Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	100	528	500	137	395	342	778
v/c Ratio	0.17	0.58	0.70	0.67	0.86	0.29	0.45	0.62
Control Delay	50.2	23.5	12.2	10.9	65.9	21.3	8.5	29.6
Queue Delay	0.6	1.8	11.5	7.0	0.0	0.5	0.6	0.0
Total Delay	50.9	25.3	23.7	17.9	65.9	21.8	9.1	29.6
Queue Length 50th (ft)	12	12	132	96	61	65	33	227
Queue Length 95th (ft)	35	65	m215	m190	m#90	m73	m46	292
Internal Link Dist (ft)	128			935		234		1534
Turn Bay Length (ft)							145	
Base Capacity (vph)	144	203	751	748	159	1358	768	1257
Starvation Cap Reductn	0	0	18	18	0	544	165	0
Spillback Cap Reductn	43	32	200	198	0	0	8	5
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.56	0.96	0.91	0.86	0.49	0.57	0.62

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

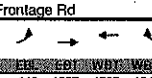
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	327	36	499	720	346	529
v/c Ratio	0.78	0.05	0.67	0.56	0.49	0.96
Control Delay	34.0	1.7	30.0	4.2	25.7	42.9
Queue Delay	1.2	0.0	0.0	0.4	0.0	0.0
Total Delay	35.2	1.7	30.1	4.6	25.7	42.9
Queue Length 50th (ft)	152	0	166	10	175	219
Queue Length 95th (ft)	323	m3	125	17	284	#428
Internal Link Dist (ft)	335			735	1707	
Turn Bay Length (ft)	230		145			60
Base Capacity (vph)	467	976	1155	1286	913	687
Starvation Cap Reductn	36	0	0	176	0	0
Spillback Cap Reductn	0	0	11	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.04	0.44	0.65	0.43	0.90

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	181	369	63	315	329	12	773	1756	283	675
v/c Ratio	0.80	1.22	0.22	0.82	0.85	0.14	0.92	1.11	0.88	0.82
Control Delay	47.1	161.3	28.6	44.5	46.1	47.6	49.6	65.1	49.8	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	161.3	28.6	44.5	46.1	47.6	49.6	65.1	49.8	33.5
Queue Length 50th (ft)	108	~310	23	193	204	7	253	~227	170	339
Queue Length 95th (ft)	#193	#506	62	#322	#342	26	#378	#492	#294	#662
Internal Link Dist (ft)		786				24	715			241
Turn Bay Length (ft)	230		50			190			135	
Base Capacity (vph)	302	918	288	440	442	238	868	1583	383	823
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	1.22	0.22	0.72	0.74	0.05	0.89	1.11	0.74	0.82

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	149	1087	1535	1348	1001	361
v/c Ratio	0.46	0.49	1.18dr	0.96	0.92	0.51
Control Delay	45.6	5.9	94.9	25.1	47.3	9.0
Queue Delay	0.0	0.0	226.4	0.0	3.1	0.0
Total Delay	45.6	5.9	290.3	25.1	50.3	9.0
Queue Length 50th (ft)	95	87	~509	803	344	38
Queue Length 95th (ft)	160	134	m410	m812	#460	114
Internal Link Dist (ft)		918	236			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	322	2197	1401	1399	1124	718
Starvation Cap Reductn	0	0	443	0	0	0
Spillback Cap Reductn	0	11	0	0	63	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.50	1.60	0.96	0.94	0.50

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	153	1226	2137	505	603	651	626
v/c Ratio	0.45	0.82	1.27	0.66	1.07	1.42	1.61
Control Delay	64.2	14.6	151.9	6.8	93.2	226.5	400.4
Queue Delay	0.0	20.0	237.6	0.5	33.6	45.3	95.1
Total Delay	64.2	34.7	389.5	7.3	126.8	269.7	495.5
Queue Length 50th (ft)	111	64	~753	38	~496	~825	~1132
Queue Length 95th (ft)	m141	m101	m#703	m30	#728	#1092	#1106
Internal Link Dist (ft)		236	355			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	338	1489	1687	768	565	598	345
Starvation Cap Reductn	0	180	107	60	0	0	0
Spillback Cap Reductn	0	295	497	0	41	38	36
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.03	1.80	0.71	1.15	1.62	2.03

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	541	1191	745	325	1274	300	72	76	66	491	1128
v/c Ratio	1.02	1.17	1.05	1.19	1.20	0.59	0.34	0.35	0.25	1.00	0.93
Control Delay	70.9	114.2	48.8	151.0	134.0	35.9	49.6	49.9	25.2	73.6	22.4
Queue Delay	0.0	26.1	9.1	0.0	349.1	0.0	0.0	0.0	0.0	99.8	51.9
Total Delay	70.9	140.3	57.9	151.0	483.1	35.9	49.6	49.9	25.2	173.4	73.8
Queue Length 50th (ft)	~212	~545	~276	~272	~565	178	57	61	19	340	171
Queue Length 95th (ft)	m189	m#435	m397	#470	#733	286	110	113	65	#565	#382
Internal Link Dist (ft)		385			570			523		234	
Turn Bay Length (ft)	400			200		30	180				
Base Capacity (vph)	531	1017	708	274	1062	507	214	217	259	492	1215
Starvation Cap Reductn	0	49	16	0	0	0	0	0	0	101	43
Spillback Cap Reductn	0	0	0	0	418	0	0	0	0	0	203
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.23	1.08	1.19	1.98	0.59	0.34	0.35	0.25	1.26	1.11

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	NB1	SBT
Lane Group Flow (vph)	95	199	829	1234	376
v/c Ratio	0.17	0.17	0.46	0.60	0.62
Control Delay	32.2	30.9	10.0	15.9	42.1
Queue Delay	2.3	1.3	0.0	0.0	0.0
Total Delay	34.5	32.2	10.0	15.9	42.1
Queue Length 50th (ft)	61	64	101	273	276
Queue Length 95th (ft)	118	104	157	337	381
Internal Link Dist (ft)		140		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	549	1148	1823	2065	610
Starvation Cap Reductn	351	750	572	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.50	0.66	0.60	0.62

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1272	24	870	601	661	73	314	158
v/c Ratio	1.35	1.30	0.26	1.19	0.96	1.01	0.20	0.83	0.36
Control Delay	230.8	174.9	56.4	136.8	65.5	75.6	43.4	53.4	14.3
Queue Delay	0.0	0.0	0.0	0.0	21.4	41.7	0.0	0.0	0.0
Total Delay	230.8	174.9	56.4	136.8	86.9	117.2	43.4	53.4	14.3
Queue Length 50th (ft)	~207	~622	17	~390	424	~509	49	216	16
Queue Length 95th (ft)	m#352	m#756	45	#619	#740	#818	m88	301	79
Internal Link Dist (ft)		159		1493		367		590	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	161	978	97	732	624	653	499	525	548
Starvation Cap Reductn	0	0	0	0	50	66	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	1.30	0.25	1.19	1.05	1.13	0.15	0.60	0.29

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	1000	112	632	195	1592	118	1460
v/c Ratio	0.97	0.99	0.65	0.71	0.92	1.26	0.67	1.28
Control Delay	99.3	57.6	50.5	32.9	58.0	153.1	52.2	163.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.3	57.6	50.5	32.9	58.0	153.1	52.2	163.7
Queue Length 50th (ft)	110	~303	61	162	108	~649	65	~501
Queue Length 95th (ft)	#243	#440	#118	222	#213	#786	#131	#737
Internal Link Dist (ft)		207		2535		1967		541
Turn Bay Length (ft)	100		130		105		110	
Base Capacity (vph)	197	1014	197	978	258	1261	197	1137
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.99	0.57	0.65	0.76	1.26	0.60	1.28

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	33	1022	166	801	113	273	540	711
v/c Ratio	0.31	1.26	1.34	0.92	0.23	0.57	1.10	1.45
Control Delay	50.1	159.1	234.7	43.8	7.4	37.1	106.5	241.8
Queue Delay	0.0	66.6	24.3	2.4	0.0	0.0	0.0	1.3
Total Delay	50.1	225.6	259.2	46.2	7.4	37.1	106.5	243.1
Queue Length 50th (ft)	21	~423	~139	265	0	160	~383	~626
Queue Length 95th (ft)	51	#553	#270	#396	43	234	#500	#852
Internal Link Dist (ft)		246		255			393	426
Turn Bay Length (ft)	50		190			60		
Base Capacity (vph)	124	812	124	975	500	478	489	492
Starvation Cap Reductn	0	86	0	84	0	0	0	0
Spillback Cap Reductn	0	20	5	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	1.41	1.39	0.90	0.23	0.57	1.10	1.46

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	1126	151	836	277	231	417	140	376	676
v/c Ratio	0.39	1.02	0.74	0.60	0.37	1.09	0.77	0.26	1.77	1.26
Control Delay	46.8	68.0	56.8	27.4	4.5	130.6	43.7	6.0	384.4	156.2
Queue Delay	0.0	97.1	0.0	5.4	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	165.1	56.8	32.7	5.0	130.6	43.7	6.0	384.4	156.2
Queue Length 50th (ft)	30	~419	93	292	0	~167	243	0	~367	~548
Queue Length 95th (ft)	64	#552	#173	314	55	#316	#383	44	m#406	m#561
Internal Link Dist (ft)		250		214			396			421
Turn Bay Length (ft)										
Base Capacity (vph)	195	1100	230	1400	758	212	540	540	212	535
Starvation Cap Reductn	0	204	0	492	184	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	1.20	0.66	0.92	0.49	1.09	0.77	0.26	1.77	1.26

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	34	1527	186	1172	535	302	209
v/c Ratio	0.19	1.38	0.78	0.90	1.18	0.59	0.76
Control Delay	40.1	204.3	50.4	25.0	136.2	19.4	46.7
Queue Delay	0.0	133.3	0.0	11.6	0.0	3.9	4.6
Total Delay	40.1	337.6	50.4	36.7	136.2	23.3	51.3
Queue Length 50th (ft)	19	~674	95	~430	~411	71	128
Queue Length 95th (ft)	48	#935	m51	m#284	#614	162	197
Internal Link Dist (ft)		247		271	834		407
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	248	1110	301	1305	464	515	348
Starvation Cap Reductn	0	197	0	136	0	0	0
Spillback Cap Reductn	0	89	0	0	0	197	82
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.67	0.55	1.00	1.18	0.80	0.79

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	235	1402	49	839	579	1431	298	1634
v/c Ratio	0.95	1.37	0.51	1.24	1.30	1.09	1.20	1.23
Control Delay	38.1	195.7	57.1	154.6	186.5	86.3	159.0	138.0
Queue Delay	2.1	21.1	0.0	6.6	0.0	1.8	0.0	21.0
Total Delay	40.2	216.8	57.1	161.2	186.5	88.1	159.0	159.3
Queue Length 50th (ft)	121	~599	32	~348	~244	~547	~232	~682
Queue Length 95th (ft)	m75	m#398	m67	m#446	#351	#685	#396	#823
Internal Link Dist (ft)		271		416		798		241
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	248	1022	106	674	446	1307	249	1333
Starvation Cap Reductn	0	34	0	0	0	0	0	50
Spillback Cap Reductn	3	0	0	8	0	6	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.42	0.46	1.26	1.30	1.10	1.20	1.27

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	49	1081	47	818	440	485
v/c Ratio	0.25	0.64	0.26	0.42	0.66	0.68
Control Delay	20.6	11.7	22.0	8.2	19.6	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	11.7	22.0	8.2	19.6	29.7
Queue Length 50th (ft)	22	167	13	44	80	62
Queue Length 95th (ft)	m17	m150	36	131	88	#125
Internal Link Dist (ft)		418		1192	922	289
Turn Bay Length (ft)	170		45			
Base Capacity (vph)	283	1969	248	1955	890	883
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.54	0.19	0.42	0.64	0.83

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	589	112	349	160	830
v/c Ratio	1.15	0.13	1.09	0.21	1.08
Control Delay	108.9	13.6	110.1	12.2	71.8
Queue Delay	0.0	0.0	0.0	0.0	17.5
Total Delay	108.9	13.6	110.1	12.2	89.3
Queue Length 50th (ft)	~323	33	~209	40	~465
Queue Length 95th (ft)	#529	64	#380	79	#693
Internal Link Dist (ft)		1606	582	425	993
Turn Bay Length (ft)	105				
Base Capacity (vph)	514	840	320	749	780
Starvation Cap Reductn	0	0	0	0	31
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.15	0.13	1.09	0.21	1.11

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	369	163	154	26	757	583
v/c Ratio	0.83	0.35	0.65	0.11	1.93	0.73
Control Delay	29.3	18.2	30.5	11.6	446.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	18.2	30.5	11.6	446.8	25.3
Queue Length 50th (ft)	143	43	62	0	~518	195
Queue Length 95th (ft)	256	97	126	20	#707	#467
Internal Link Dist (ft)		500	95		265	834
Turn Bay Length (ft)						
Base Capacity (vph)	586	604	527	481	983	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.27	0.29	0.05	1.93	0.73

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	510	393	1812	2048
v/c Ratio	1.11	0.74	0.92	1.04
Control Delay	117.3	47.0	30.1	54.5
Queue Delay	0.0	0.0	18.7	0.0
Total Delay	117.3	47.0	48.8	54.5
Queue Length 50th (ft)	~206	130	857	~793
Queue Length 95th (ft)	#315	180	#772	#949
Internal Link Dist (ft)	2	922	3	798
Turn Bay Length (ft)				
Base Capacity (vph)	458	595	1976	1976
Starvation Cap Reductn	0	0	222	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.66	1.03	1.04

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	658	845	1230	1974
v/c Ratio	0.62	1.58	0.79	0.64
Control Delay	30.2	295.5	18.1	12.3
Queue Delay	1.1	0.0	65.9	2.7
Total Delay	31.3	295.5	84.1	15.0
Queue Length 50th (ft)	168	~683	253	236
Queue Length 95th (ft)	227	#891	352	284
Internal Link Dist (ft)	983		192	398
Turn Bay Length (ft)		70		
Base Capacity (vph)	1057	534	1549	3103
Starvation Cap Reductn	0	0	471	0
Spillback Cap Reductn	187	0	0	975
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	1.58	1.14	0.93

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1017	1225	976	1060
v/c Ratio	1.14	0.98	1.01	0.45
Control Delay	113.0	57.1	71.1	9.2
Queue Delay	85.0	164.6	248.3	13.1
Total Delay	198.0	221.8	319.4	22.4
Queue Length 50th (ft)	~441	444	~380	170
Queue Length 95th (ft)	#573	#801	#500	212
Internal Link Dist (ft)	399	1673		192
Turn Bay Length (ft)			260	
Base Capacity (vph)	895	1247	967	2381
Starvation Cap Reductn	0	0	352	1293
Spillback Cap Reductn	130	362	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.33	1.58	1.59	0.99

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	126	64	233	351	803	98	883
v/c Ratio	0.69	0.11	0.58	0.51	0.97	0.30	0.85
Control Delay	45.6	14.6	21.9	5.5	37.6	7.0	17.4
Queue Delay	0.0	0.0	4.1	0.7	12.6	0.1	0.0
Total Delay	45.6	14.6	26.0	6.2	50.2	7.7	17.4
Queue Length 50th (ft)	42	14	50	0	240	13	208
Queue Length 95th (ft)	#126	39	#151	37	#475	29	#397
Internal Link Dist (ft)		493		83	747		411
Turn Bay Length (ft)							
Base Capacity (vph)	183	556	405	692	848	323	1108
Starvation Cap Reductn	0	0	105	121	0	0	0
Spillback Cap Reductn	0	0	0	0	58	13	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.11	0.78	0.61	1.01	0.32	0.80

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1005: 65th Street & Overland Avenue — 2030 Plus Alt#4 SAT

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	192	47	172	282
v/c Ratio	0.19	0.23	0.14	0.66
Control Delay	5.6	25.2	5.5	22.4
Queue Delay	2.1	0.0	0.0	0.1
Total Delay	7.6	25.2	5.5	22.5
Queue Length 50th (ft)	10	16	20	65
Queue Length 95th (ft)	m32	41	52	133
Internal Link Dist (ft)	63		654	1093
Turn Bay Length (ft)				
Base Capacity (vph)	1030	266	1195	562
Starvation Cap Reductn	697	0	0	0
Spillback Cap Reductn	0	0	125	31
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.58	0.18	0.16	0.47

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1009: Shellmound Way & Christie Ave — 2030 Plus Alt#4 SAT

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	58	148	623	581	155	387	521	707
v/c Ratio	0.14	0.38	1.05	0.99	1.27	0.35	0.63	0.69
Control Delay	35.6	27.2	70.0	53.9	176.3	16.7	5.6	36.8
Queue Delay	0.1	5.3	134.6	117.5	0.0	0.7	5.9	0.5
Total Delay	35.6	32.5	204.6	171.4	176.3	17.4	11.5	37.3
Queue Length 50th (ft)	39	58	~500	436	~137	47	37	226
Queue Length 95th (ft)	69	119	#756	#686	m#189	m58	m64	293
Internal Link Dist (ft)	185			342		235		1556
Turn Bay Length (ft)							85	
Base Capacity (vph)	403	391	596	589	122	1110	824	1022
Starvation Cap Reductn	0	0	78	78	0	410	243	0
Spillback Cap Reductn	46	183	139	138	0	0	81	61
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.71	1.38	1.29	1.27	0.56	0.90	0.75

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1010: Shellmound Way & Shellmound St — 2030 Plus Alt#4 SAT

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	482	73	751	989	433	470
v/c Ratio	0.97	0.08	0.87	0.92	0.65	0.43
Control Delay	53.4	0.8	24.0	31.9	36.8	9.4
Queue Delay	28.7	0.0	0.3	9.2	0.0	0.0
Total Delay	82.1	0.8	24.4	41.0	36.8	9.4
Queue Length 50th (ft)	322	3	245	749	256	119
Queue Length 95th (ft)	#547	m4	m244	m810	#431	222
Internal Link Dist (ft)	342			733	1706	
Turn Bay Length (ft)		220	200			
Base Capacity (vph)	499	1064	1166	1204	666	1089
Starvation Cap Reductn	48	0	0	193	0	0
Spillback Cap Reductn	0	0	104	0	0	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.07	0.69	0.98	0.65	0.43

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1011: I-80 WB Ramps & Frontage Rd — 2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	23	8	477	463	45	366	1436	147	557
v/c Ratio	0.22	0.17	0.07	0.80	0.78	0.32	0.36	0.91	0.63	0.91
Control Delay	35.9	35.6	20.7	36.9	35.1	35.7	23.6	10.6	33.3	32.7
Queue Delay	0.0	0.0	0.0	4.4	3.3	0.0	0.0	0.8	1.0	2.8
Total Delay	35.9	35.6	20.7	41.3	38.3	35.7	23.6	10.8	33.3	35.5
Queue Length 50th (ft)	13	11	0	231	221	21	75	0	69	254
Queue Length 95th (ft)	39	34	13	#452	#436	54	127	#86	126	#486
Internal Link Dist (ft)		765				24		250		241
Turn Bay Length (ft)	210		55			175			135	
Base Capacity (vph)	322	339	294	595	595	306	1156	1583	431	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	22	66	66	0	0	0	0	83
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.03	0.90	0.87	0.15	0.32	0.91	0.34	0.87

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1012: Powell St & Frontage Rd
2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	125	370	950	1238	1171	282
v/c Ratio	0.68	0.20	0.71	0.86	0.88	0.37
Control Delay	51.4	13.9	22.7	24.7	34.0	4.8
Queue Delay	0.0	0.0	43.3	0.0	143.8	0.0
Total Delay	51.4	13.9	65.9	24.7	177.6	4.8
Queue Length 50th (ft)	87	64	315	730	901	16
Queue Length 95th (ft)	143	108	m318	m739	419	62
Internal Link Dist (ft)		818	215			
Turn Bay Length (ft)	340					190
Base Capacity (vph)	290	1894	1343	1399	1592	865
Starvation Cap Reductn	0	0	466	0	311	0
Spillback Cap Reductn	0	2	0	0	702	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.20	1.08	0.88	1.32	0.33

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1013: Powell St & I-80 EB Off-Ramp
2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	134	1372	1724	534	464	818	796
v/c Ratio	0.77	1.15	1.04	0.62	0.63	1.03	2.04
Control Delay	69.2	98.2	63.1	5.0	28.9	61.6	495.4
Queue Delay	0.0	210.6	67.0	0.3	0.5	77.4	206.2
Total Delay	69.2	308.7	150.0	5.3	29.5	139.0	701.5
Queue Length 50th (ft)	78	~424	~534	22	262	~547	~1042
Queue Length 95th (ft)	m124	#530	m#654	m40	382	#810	#1449
Internal Link Dist (ft)		215	365			1446	
Turn Bay Length (ft)	275			400	625		
Base Capacity (vph)	209	1197	1654	863	794	793	391
Starvation Cap Reductn	0	271	91	54	0	0	0
Spillback Cap Reductn	0	549	269	0	64	123	94
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.62	1.24	0.66	0.69	1.22	2.08

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1014: Powell St & Christie Ave
2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	607	1538	827	380	816	333	153	161	110	626	1187
v/c Ratio	1.02	1.46	1.06	1.39	0.77	0.62	0.84	0.86	0.42	1.26	0.92
Control Delay	70.9	235.1	186.2	231.4	40.8	26.8	91.5	93.8	26.5	159.7	24.2
Queue Delay	0.0	21.7	2.0	0.0	2.4	0.0	0.0	0.0	0.0	123.5	95.0
Total Delay	70.9	256.8	188.2	231.4	43.2	26.8	91.5	93.8	26.5	283.2	119.2
Queue Length 50th (ft)	~234	~792	~783	~358	275	131	121	127	25	~549	203
Queue Length 95th (ft)	m177	m#536	m#457	#545	350	232	m#235	m#249	m69	m#635	m343
Internal Link Dist (ft)		365			570			520		235	
Turn Bay Length (ft)	400			200		55	120				
Base Capacity (vph)	593	1057	806	274	1062	538	183	188	261	495	1293
Starvation Cap Reductn	0	34	2	0	0	0	0	0	89	265	
Spillback Cap Reductn	0	0	0	0	137	0	0	0	0	0	315
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.50	1.37	1.39	0.86	0.62	0.84	0.86	0.42	1.54	1.21

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1015: Christie Ave & Shellmound St
2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	139	293	1172	1741	499
v/c Ratio	0.22	0.22	0.83	0.93	0.58
Control Delay	23.6	23.2	28.6	21.7	13.2
Queue Delay	1.2	0.7	2.2	1.5	0.0
Total Delay	24.7	23.8	30.8	23.3	13.2
Queue Length 50th (ft)	79	82	311	633	319
Queue Length 95th (ft)	127	114	370	#781	452
Internal Link Dist (ft)		150		820	733
Turn Bay Length (ft)	200				
Base Capacity (vph)	644	1346	1411	1883	855
Starvation Cap Reductn	334	723	129	0	0
Spillback Cap Reductn	150	313	0	44	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.47	0.91	0.96	0.58

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1016: Powell St & Hollis Street — 2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	110	1182	43	871	361	337	40	308	107
v/c Ratio	1.02	1.08	0.42	1.01	0.88	0.78	0.10	0.76	0.25
Control Delay	130.7	78.8	43.6	60.9	45.5	36.4	21.2	34.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.7	78.8	43.6	60.9	45.5	36.4	21.2	34.0	6.7
Queue Length 50th (ft)	~52	~320	18	~212	145	130	13	118	0
Queue Length 95th (ft)	#142	#442	#51	#324	#285	#252	35	#220	35
Internal Link Dist (ft)		922		1493		3624		2571	
Turn Bay Length (ft)	110		80				70		
Base Capacity (vph)	108	1090	103	864	427	448	420	440	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.08	0.42	1.01	0.85	0.75	0.10	0.70	0.24

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1021: 40th St & Emery Street — 2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	21	1604	190	1495	469	238	79
v/c Ratio	0.34	1.20	1.19	0.87	1.06	0.48	0.31
Control Delay	58.3	123.0	129.3	22.4	97.0	16.0	30.5
Queue Delay	0.0	179.1	0.0	115.0	0.0	0.2	0.0
Total Delay	58.3	302.1	129.3	137.4	97.0	16.2	30.5
Queue Length 50th (ft)	11	~614	~144	344	~330	45	42
Queue Length 95th (ft)	m28	#951	m#105	m#497	#525	117	72
Internal Link Dist (ft)		1232		264	457		254
Turn Bay Length (ft)	100		200			130	
Base Capacity (vph)	62	1334	159	1713	443	494	447
Starvation Cap Reductn	0	0	0	522	0	0	0
Spillback Cap Reductn	0	333	0	0	0	33	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.60	1.19	1.26	1.06	0.52	0.18

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
1022: 40th St & San Pablo Avenue — 2030 Plus Alt#4 SAT

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	209	1380	78	857	690	1232	170	1504
v/c Ratio	0.90	1.25	0.76	1.05	1.26	1.00	0.80	1.43
Control Delay	61.1	127.9	84.2	81.7	166.3	59.5	59.7	226.9
Queue Delay	0.0	35.2	0.0	57.0	409.3	0.0	0.0	1.2
Total Delay	61.1	163.1	84.2	138.7	575.7	59.5	59.7	228.1
Queue Length 50th (ft)	113	~563	60	~318	~285	~451	105	~667
Queue Length 95th (ft)	m135	m#431	#128	#443	#390	#585	#199	#826
Internal Link Dist (ft)		264		169		434		3676
Turn Bay Length (ft)	185		90		250		195	
Base Capacity (vph)	246	1107	108	819	549	1232	239	1054
Starvation Cap Reductn	0	66	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	98	231	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	1.33	0.74	1.19	2.17	1.00	0.71	1.43

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.