

# BIKING, WALKING, AND ROLLING IN EMERYVILLE TODAY

Purpose: This chapter describes the active transportation landscape in Emeryville, including a discussion of related themes that inform the recommended infrastructure projects, programs, and policies in the community.

Why it matters: Understanding Emeryville's current travel patterns, strengths, and challenges will inform which types of projects and programs the City needs to thrive.

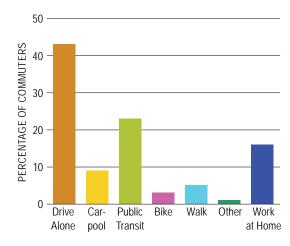


Figure 1. Commute modes (2020)

### **Demographics**

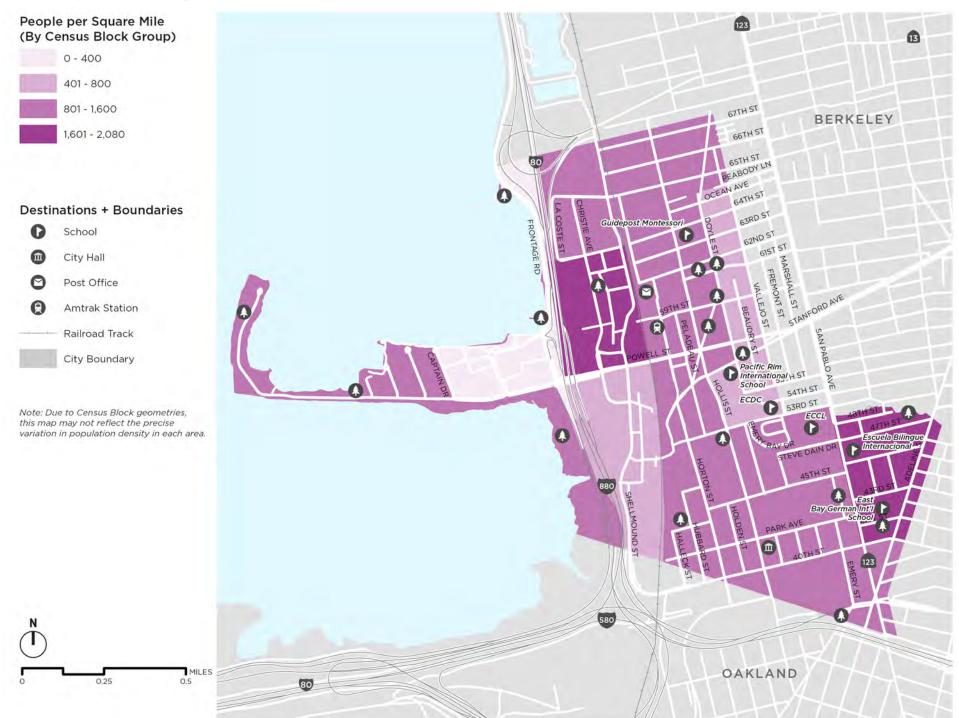
Emeryville is home to 11,679 residents, according to 2020 American Community Survey five-year estimates. The neighborhoods located in the southeastern corner of the City between San Pablo Avenue and Adeline Street as well as Christie Avenue north of Powell Street contain the highest density of residents compared to other areas of the City (Map 5). In addition to local residents, more than 24,000 employees are based in Emeryville. Major employers within the

City include a number of large offices and research facilities such as Pixar, Grifols, and Amyris. Emeryville also serves as a regional commercial and retail hub where a number of shopping centers attract many from surrounding areas.

The median age of Emeryville residents is 34.8 years, slightly younger than the median age of the San Francisco-Oakland-Berkeley metro area at 39.1 years. Young

adults aged 20-39 account for 54% of Emeryville's total population, while children account for 8% and adults over the age of 65 account for 11%.

Almost 43% of Emeryville's residents commute to work by driving alone (**Figure 1**). 23% reported commuting to work by public transit, and 8% reported biking or walking as their primary mode.



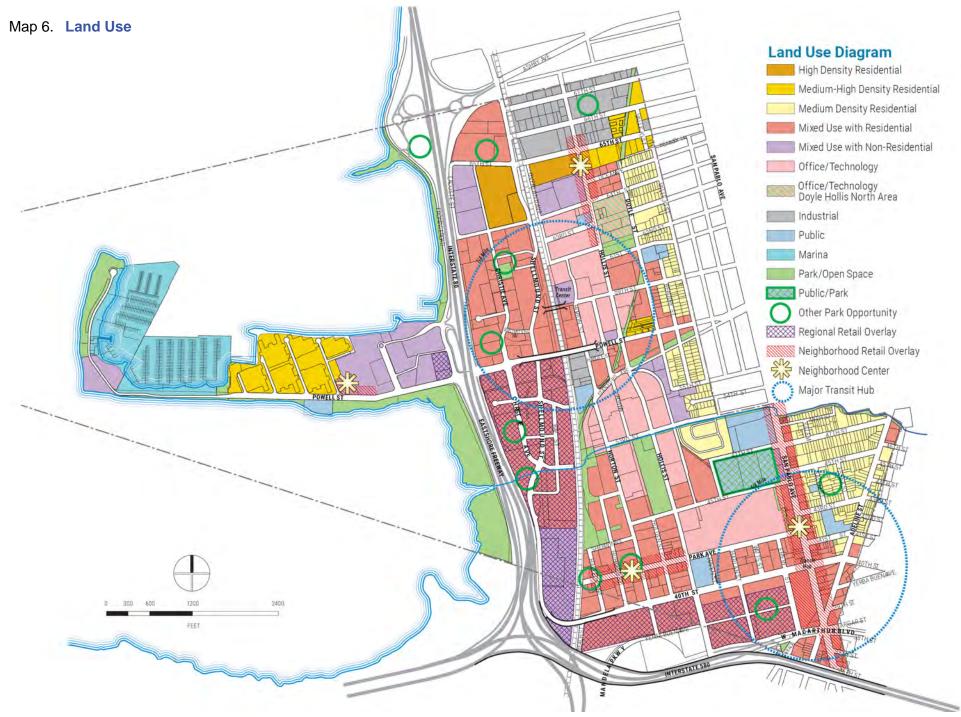
# Major Destinations, Employment Centers, and Retail Hubs

Emeryville's current land use is a mix of office, commercial, residential, and industrial (including research and development). Areas zoned Mixed Use are the most prevalent land use type, accounting for 45% of the total land area. Prominent mixed-use areas are clustered around 40th Street, Shellmound Street, Christie Avenue, and San Pablo Avenue.

Emeryville contains a variety of employment, retail, and recreational destinations (**Map 6**). Major destinations within the City include the 40th Street/ Shellmound Street shops and restaurants concentrated at Bay Street shopping center, Powell Street Plaza, Emeryville Public Market, Bridgecourt Center, and IKEA, as well as the City's major employers such as Pixar, Grifols, Amyris, and a concentration of employment in the North Hollis and Watergate towers portions of town. Recreation and park destinations include the Bay Trail, Emeryville Greenway, Emeryville Marina Park, Emeryville Center of Community Life Pool, Christie Park, and Doyle Hollis Park.

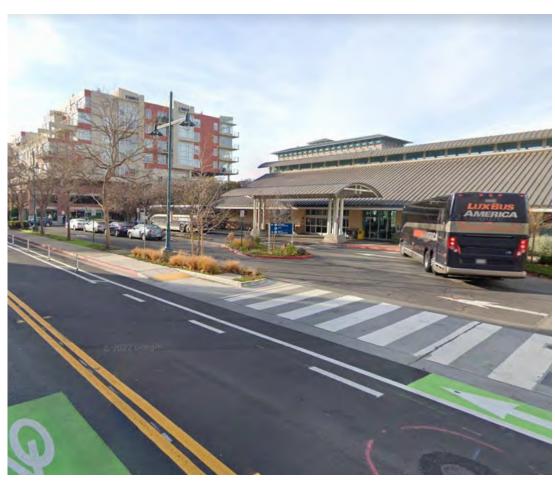
The geographic layout of Emeryville's major destinations, residential neighborhoods, and employers presents challenges to people biking, walking, and rolling between these points, with San Pablo Avenue, I-80,

and the Mainline railroad corridors creating barriers to those using active modes of transportation, particularly in traveling east-west and trying to access some of Emeryville's most attractive destinations for employment, recreation, and retail. North-south barriers include Powell and 40th, but parallel routes to arterials make the problems with their speed and volumes less acute, whereas I-80 and the railroad have limited bridge and underpass options, resulting in constrained east-west options for people biking, walking, and rolling and creating potential conflicts and choke points.



### **Transit**

Emeryville is served by several transit providers and routes that offer connections to local and regional destinations (Map 7). The Amtrak Station and AC Transit Transbay bus stops throughout the City, as well as the nearby Ashby, MacArthur, and West Oakland Bay Area Rapid Transit (BART) stations give residents access to the surrounding region. Local bus providers including AC Transit and the Emery Go-Round provide connections in and around Emeryville, as well as to destinations in Berkeley and Oakland. According to AC Transit boarding and alighting counts from 2019, the most popular bus stops are located on 40th Street east of Horton Street. San Pablo Avenue, and on Christie Avenue between 64th Street and 65th Street. Prior to the COVID-19 pandemic, Casual Carpool Pickup locations were also available to residents near Captain Drive on the peninsula and at the intersection of Christie Avenue and 64th Street. Casual Carpool has been slow to return as of early 2023. Pedestrian improvements in these areas are especially important to consider in the Active Transportation Plan as well as first and last mile access to the BART stations in neighboring jurisdictions.



The Horton Street bike lane connects people biking and rolling to the Emeryville Amtrak Station.

#### **Emeryville Transit Stops**

- AC Transit Stop (Local)
- AC Transit Stop (Transbay)
- Emery Go-Round
- ba **BART Station**
- Amtrak Station
- Casual Carpool Pickup

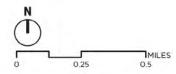
#### **Destinations + Boundaries**

- 0 School
- City Hall
- Post Office
- Park

Commercial

City Boundary





### **Equity**

Equity is a key piece of all planning processes, including Emeryville's *Active Transportation Plan*. An equitable transportation system is accessible to underserved communities and is geographically distributed throughout neighborhoods and demographic groups. For the existing conditions phase of the Plan, concentrations of low-income workers and median household incomes within Emeryville were evaluated to better understand where there may be a need for biking, walking, and rolling infrastructure.

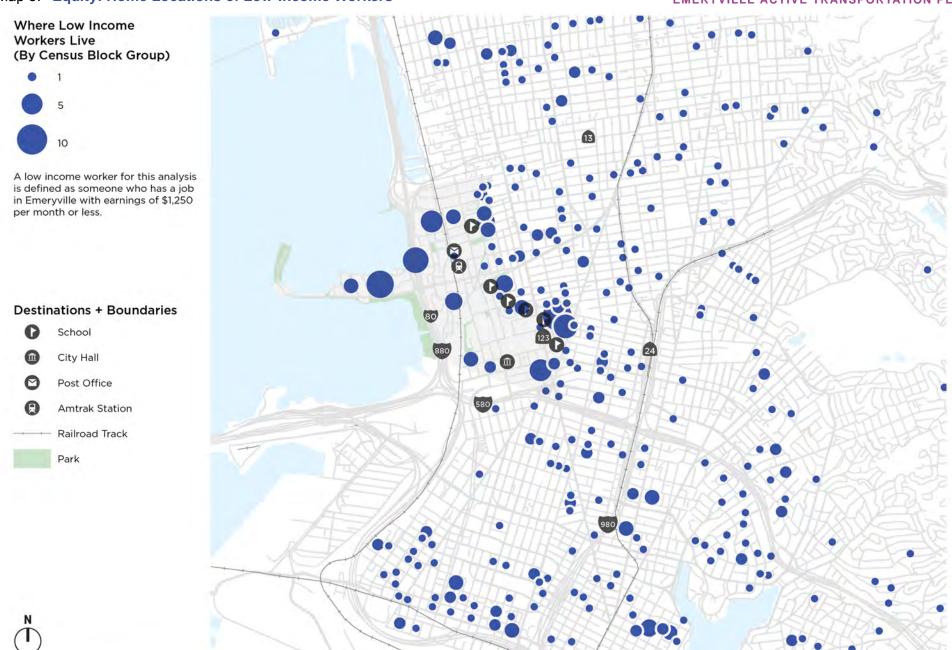
The home locations of low-income workers were evaluated using 2018 Longitudinal Employer-Household Dynamics (LEHD) data from the U.S. Census Bureau (**Map 8**). For this analysis, a low-income worker is defined as someone who has a job with earnings of \$1,250 per month or less. The home locations of low-income workers who work in Emeryville tend to be clustered on the eastern edge of the City in the

neighborhoods along Doyle Street, south of Stanford Avenue, and east of San Pablo Avenue between 40th Street and 48th Street. Active transportation improvements in these areas are especially important to creating an equitable transportation system.

The median annual household income of the City of Emeryville is \$104,063, slightly less than the surrounding San Francisco-Oakland-Berkeley metro area. Areas within Emeryville where median household incomes are lower than the City's median include the residential areas on the peninsula, the neighborhoods south of 53rd Street between Horton Street and Adeline Street, and the neighborhoods east of Doyle Street (Map 9). Residents of these neighborhoods will benefit from a wider variety of car-free transportation options including improved walking connections to nearby transit stops, low-stress biking and rolling infrastructure, and safer arterial crossings.

Several areas throughout Emeryville emerged as key places to consider for an equitable transportation system. The following locations have both a lower relative median household income than surrounding areas and also a concentration of low-income workers:

- East of San Pablo Avenue between 40th Street and 48th Street
- East of Doyle Street between Peabody Lane and 55th Street
- North of Powell Street between Frontage Road and Captain Drive





### Biking, Walking, and Rolling Today

Every year, the United States Census surveys how commuters over the age of 16 get to work. **Table 1** presents journey to work data for Emeryville and compares it to Berkeley, Oakland, Alameda County, California, and the United States. In 2020, the most recent year for which data is available, 5.2% of Emeryville workers

walked to work and 2.9% bicycled to work. Emeryville's active modes and public transit commuting rate is higher than Alameda County, California, and the United States and comparable to Oakland's commuting trends.

**Table 2** presents commuting trends over the past 10 years. While walking to work has declined from 9.6% in 2010 to 5.2% in 2020, bicycling, using public transit, and working from home have all increased. Driving alone in Emeryville has declined 20% over the past decade.

**Table 1. Commute Mode Share Comparison** 

	WALKING	BICYCLING	WORKED AT HOME	PUBLIC TRANSIT	DROVE ALONE	OTHER
Emeryville	5.2%	2.9%	15.7%	22.8%	43.0%	10.4%
Berkeley	15.7%	6.6%	16.7%	23.2%	30.9%	6.9%
Oakland	3.6%	2.3%	10.8%	21.5%	49.9%	11.9%
Alameda County	3.3%	1.7%	11.0%	14.3%	58.5%	11.2%
California	2.5%	0.8%	8.4%	4.6%	72.1%	11.6%
United States	2.6%	0.5%	7.3%	4.6%	74.9%	10.1%

Table 2. Emeryville Commute Mode Trends, 2011 to 2020

	2011 To	O 2015	2016 TO 2020		
	ACS 5 YEAR ESTIMATES	MARGIN OF ERROR	ACS 5 YEAR ESTIMATES	MARGIN OF ERROR	
Walk	7.1%	±3.1	5.2%	±1.7	
Bike	3.1%	±1.4	2.9%	±1.3	
Work at Home	4.3%	±1.6	15.7%	±4.5	
Public Transit	23.1%	±3.7	22.8%	±3.5	
Drive Alone	50.2%	±5.1	43.0%	±4.3	
Other	12.2%	NA	10.4%	NA	

Given the high level of transit use among Emeryville residents, improving pedestrian and bicycle connections to transit will sustain the high level of transit ridership. Providing convenient and safe bicycle connections to employment in downtown Oakland, south Berkeley, and other nearby employment centers may further improve the bicycle and walking mode share. Telecommuting or working from home is also showing greater popularity.

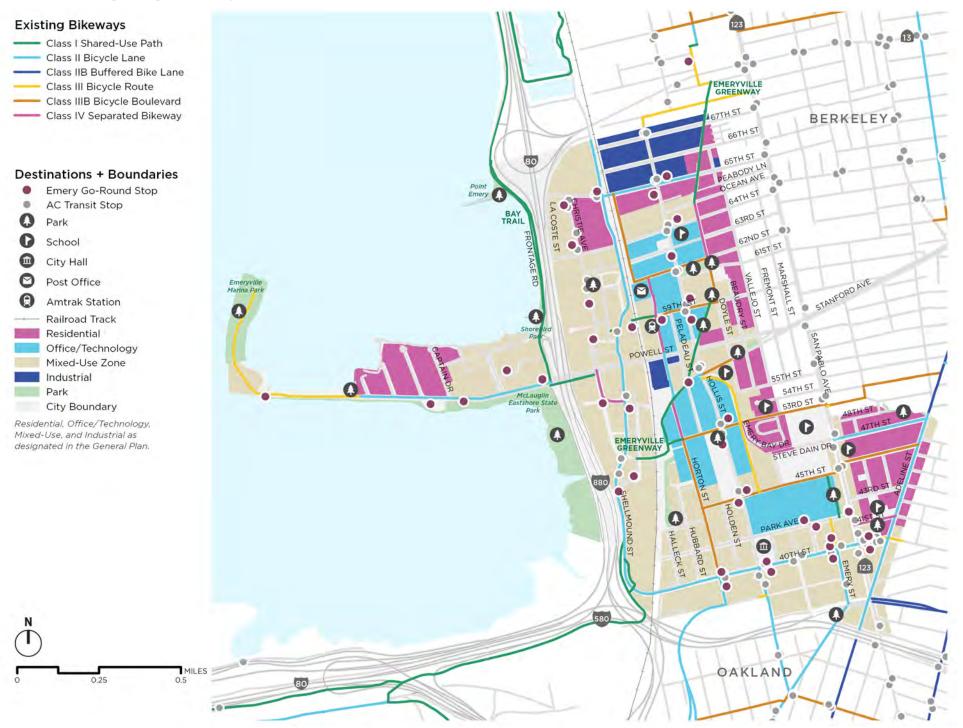
Emeryville's existing bike network is made up of shared-use paths, separated bikeways, buffered bike lanes, bike lanes, bike routes, and bicycle boulevards (**Table 3**). Descriptions below outline the definitions of these terms and how they will be used throughout this Plan.

Table 3. Existing Bike Network

BIKEWAY TYPE	MILEAGE		
Shared-Use Path (Class I)	2.1 miles		
Bicycle Lane (Class II)	4.2 miles		
Bicycle Route (Class III)	1.5 miles		
Bicycle Boulevard (Class IIIB)	2.5 miles		
Separated Bikeway (Class IV)	0.9 miles		
Total	11.1 miles		

Emeryville has a total of 11.1 miles of designated biking facilities (**Map 10**). These are recorded in the Plan as centerline street miles. Bicycle lanes are the most common facility type, accounting for 38% of the total biking network. Bicycle boulevards are the next most common facility type (2.5 miles), followed by shared-use paths (2.1 miles).

Key existing biking and rolling routes through Emeryville include north-south connections on Shellmound Street, the San Francisco Bay Trail, and the Emeryville Greenway, as well as eastwest connections on 40th Street and the South Bayfront Bridge. Bicycle boulevards throughout the City also provide important biking routes through residential areas where traffic volumes and speeds are lower. As Emeryville is situated between popular destinations in Oakland and Berkeley, low-stress biking connections not only within City limits but also to surrounding areas will be especially important in the development of project recommendations later in the planning process.



### **Bike Infrastructure**

This visual glossary accompanies Map 10: Existing Designated Bicycle Facilities by defining the existing and potential future bikeway types in Emeryville with visual examples. In addition to common bikeway facility names, Caltrans uses four classes of bikeways (I, II, III, and IV). This plan uses those classifications, but expands the facility types by including Class IIB and Class IIIB designations to differentiate buffered bike lanes (Class IIB) from standard bike lanes (Class II) and bike boulevards (Class IIIB) to differentiate from standard bike routes (Class III). Separated Bikeways (Class IV) can take many different forms and three examples are shown on the following page.

### **Shared-Use Path (Class I)**



Bike paths and shared-use paths are typically paved bi-directional pathways that are separate from the road right-of-way. Ideally, shared-use paths will follow a distinct course in a separate right-of-way, often along former railroad beds, along water courses, or other rights-of-way that usually have few crossing roadways. Source: FHWA.



### Bike Lane (Class IIB)

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and flows in the same direction as motor vehicle traffic. Source: NACTO.

#### **Buffered Bike Lane (Class IIB)**



Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Source: NACTO.

### **Bike Boulevard (Class IIIB)**



Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Signs, pavement markings, and speed and volume management measures are used to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets. Source: NACTO.

#### Two-Way Cycle Track (Class IV)



Two-way cycle tracks (also known as protected bikeways, separated bikeways, and on-street bike paths) are physically separated cycle tracks that allow bicycle movement in both directions on one side of the road. Source: NACTO.

#### Raised Bikeway (Class IV)



Raised cycle tracks are bicycle facilities that are vertically separated from motor vehicle traffic. Many are paired with a furnishing zone between the cycle track and motor vehicle travel lane and/or pedestrian area. Source: NACTO.

#### Parking Protected Bikeway (Class IV)



One-way parking protected bikeways are at street level and use a parking lane for physical protection from passing traffic. Source: NACTO.

For more information on Separated Bikeway implementation, please see this guide from the California Bicycle Coalition: https://cal.streetsblog.org/wp-content/uploads/sites/13/2016/09/CalBike-Class-IV-Bikeways-Brochure-Final-Web.pdf

### SAN FRANCISCO BAY TRAIL AND PARK ACCESS

Emeryville is home to a scenic and welltraveled segment of the San Francisco Bay Trail—a 500-mile planned shared-use path network that will circumnavigate the San Francisco Bay. Located along the City's waterfront and on several arterial roadways, Emeryville's Bay Trail segment provides walking and rolling access to the Bay Bridge as well as numerous parks along the waterfront including McLaughlin Eastshore State Park, the Emeryville Marina Park, Point Emery, the Berkeley Marina, Cesar Chavez Park, Golden Gate Fields, and the Albany Bulb. Walking and rolling routes to reach the trail within Emeryville are key connections in the active transportation network. As such, these connections should be given great focus.



The Emeryville Marina is a popular biking, walking, and rolling destination along the Bay Trail.

### EMERYVILLE GREENWAY

The Emeryville Greenway is a Class I shared-use path that connects to a residential slow street where cars are not permitted to drive. The Greenway's seamless connection to the Doyle Street slow street enables biking and rolling conditions that are comfortable for all ages and abilities and are characterized by minimal interactions with car traffic. The Greenway serves as a prominent northsouth connection in the City's existing biking and rolling network, connecting to Berkeley's 9th Street bicycle boulevard to the north and the South Bayfront Bridge to the south where users can access the Bay Trail and Mandela Parkway. The Greenway provides an essential backbone when considering how to best maximize Emeryville's all ages and abilities network.



The Emeryville Greenway hosts a number of different user types with a wide range in abilities.



A raised bicycle lane next to the sidewalk on Shellmound St allows for people walking and rolling to comfortably share the same space.

The majority of Emeryville's street network is equipped with sidewalks, but some sidewalks are narrow or have barriers that make walking difficult. The City used input from the community to identify sidewalk barriers and width restrictions in the

existing pedestrian network (**Map 11**). The following corridors contain a high density of sidewalk width restrictions relative to other areas within Emeryville:

- 40th Street between Halleck Street and Adeline Street
- ► 64th Street between Christie Avenue and Vallejo Street
- Powell Street between Frontage Road and Beaudry Street

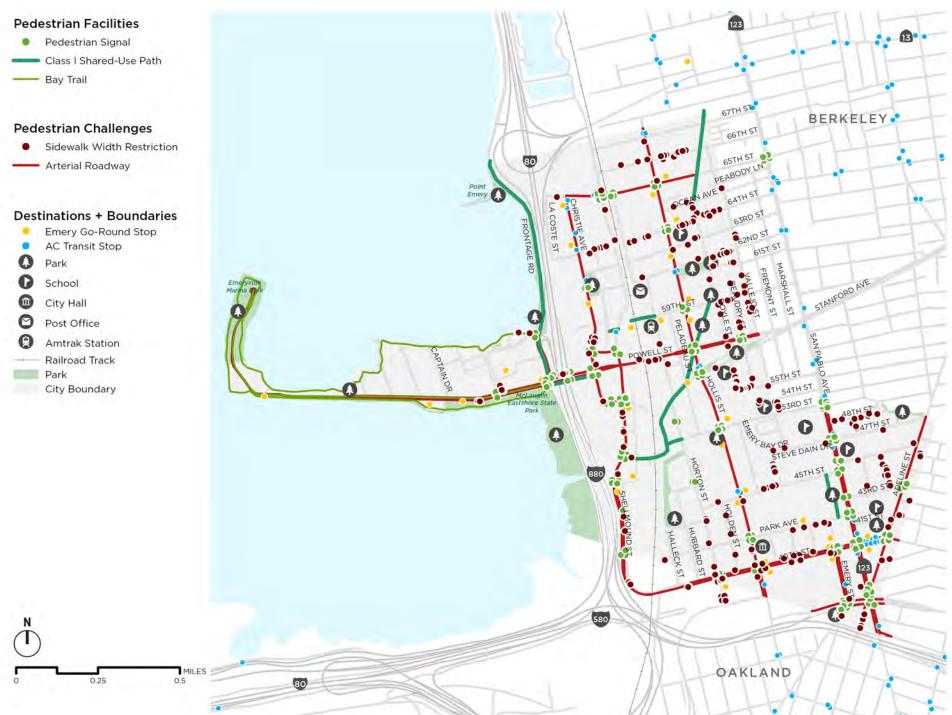
Arterial roadways also pose challenges to people walking throughout Emeryville. On- and off-ramp connections to I-80, high traffic volumes, and multiple lanes of traffic often characterize the areas surrounding walking destinations. Pedestrian signals and intersection upgrades that provide more protection for people walking will help improve the City's existing sidewalk network and encourage walking as a mode of transportation.

# EXISTING ACTIVE TRANSPORTATION PROGRAMS

Bicycle-, walking-, and rolling-focused programs provide education and encouragement for residents. Prepandemic, Bike to Work Day was a celebration of bicycles as a fun and healthy way to get to work, as well as an opportunity for those who do not usually bike commute to try it out. Organized by Bike East Bay, the City of Emeryville has a long history of sponsoring "Energizer Stations" where participants can receive free snacks and coffee from local businesses, repair kits, and goodie bags.



The City of Emeryville has a long history of participating in the annual Bike to Work Day encouragement campaign.



### **Pedestrian Network Improvements**

There are many features that contribute to a comfortable and safe walking environment.

### **New/Improved Sidewalk**



Sidewalks and walkways are "pedestrian lanes" that provide people with space to travel within the public right-of-way that is separated from roadway vehicles. Source: FHWA.



#### Crosswalk

Marked crosswalks indicate optimal or preferred locations for pedestrians to cross and help designate right-of-way for motorists to yield to pedestrians. Source: FHWA.



## Rectangular Rapid Flashing Beacon (RRFB)

User-activated pedestrian signals that use flashing yellow lights to alert motorists to the presence of people walking in the crosswalk. They can be installed in midblock locations or at intersections where a full traffic signal is not warranted. In residential areas, alternative flashing signs may be considered that illuminate the perimeter of the sign.



### Pedestrian Hybrid Beacon (PHB)

PHBs can warn and control traffic at unsignalized locations and assist pedestrians in crossing a street or highway at a marked crosswalk. The PHB rests in dark until a pedestrian activates it via a pushbutton or other form of detection. PHBs are used on higher speed and higher volume roadways than RRFBs. Source: FHWA.



### **Curb Extensions**

Curb extensions—also known as bulb-outs or neckdowns—extend the sidewalk or curb line out into the parking lane and reduce the effective street width. Source: FHWA.



### **Leading Pedestrian Interval (LPI)**

LPIs can be programmed into traffic signals to minimize conflicts between pedestrians crossing a roadway and left- or right-turning vehicles. LPIs give the pedestrian the WALK signal 3-7 seconds before the motorists are allowed to proceed through the intersection, which makes them more visible. Source: FHWA.



### Median Refuge Island

A median refuge island, or crossing island, is a median with a refuge area that is intended to help protect pedestrians crossing a multilane road. Crossing islands should be considered as a supplement to the crosswalk. A pedestrian refuge island allows pedestrians to focus on one direction of traffic at a time as they cross and provides space to wait for an adequate gap in oncoming traffic before finishing the second phase of the crossing. Source: FHWA.



### **Signal Timing Adjustments**

In general, shorter cycle lengths (ideally less than 90 seconds) and longer walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best because it provides an automatic pedestrian phase. Source: FHWA.



### No Right on Red

Prohibiting right turns on red should be considered where exclusive pedestrian phases or high pedestrian volumes are present. Source: FHWA.

# **BIKING, WALKING, AND ROLLING SAFETY**

Bicycle- and pedestrian-related collision data can provide insight into specific locations and roadways that tend to have higher rates of collisions. This analysis uses collision data acquired from University of California Berkeley's Transportation Injury Mapping Systems (TIMS) between the dates 1/1/2017 and 12/31/2021 to determine high-level collision trends and areas in Emeryville with a history of frequent collisions. It is important to note that this analysis relied on reported collisions, and not all collisions involving people biking, walking, and rolling are reported. Further, near-crashes are not included as they are typically not reported.

In total, 33 bicycle-related collisions and 28 pedestrian-related collisions occurred in Emeryville during the study period. Bicycle-related collisions per year did not tend to drastically fluctuate from year to year, though reported collisions almost tripled from 2017 to 2018 (**Figure 2**).

Pedestrian-related collisions similarly did not drastically fluctuate throughout the study period; however, 2021 experienced an increase from 2020 (**Figure 3**). One pedestrian fatality occurred outside the study period in 2016 at the intersection of Powell Street and Christie Avenue in the pedestrian right-of-way.

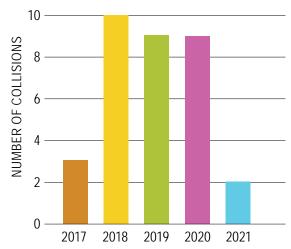


Figure 2. Bicycle-related collisions

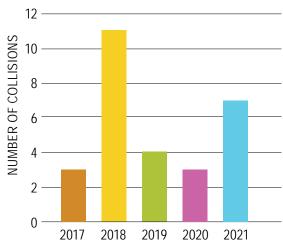


Figure 3. Pedestrian-related collisions

### **Bicycle-related Collision Trends**

Bicycle-related collisions that occurred during the study period most commonly resulted in 'Minor Injury' severity type (Figure 4). Corridors within Emeryville that contain the highest rate of bicycle-related collisions include Hollis Street, San Pablo Avenue, and Frontage Road (Map 12). The following trends emerged during the safety analysis:

Six bicycle-related collisions occurred on San Pablo Avenue.

- Five bicycle-related collisions occurred at intersections on Emeryville's existing bicycle boulevard network.
- Two bicycle-related collisions occurred at the intersection of San Pablo Avenue, Adeline Street, and MacArthur Boulevard due to improper turning and being on the wrong side of the road.
- A severe collision occurred at the intersection of 63rd Street and Hollis Street within the automobile right-of-way.

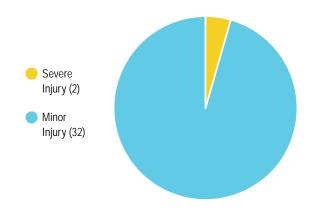


Figure 4. Bicycle collision severity



# Pedestrian-related Collision Trends

Pedestrian-related collisions that occurred during the study period most commonly resulted in 'Minor Injury' severity type (**Figure 5**). Corridors within Emeryville that contain the highest rate of pedestrian-related collisions include Powell Street, 40th Street, and Hollis Street (**Map 13**). The following trends emerged during the safety analysis:

- Six pedestrian collisions occurred along Powell Street during the study period.
- Twelve collisions occurred within 1,000 feet of a school.

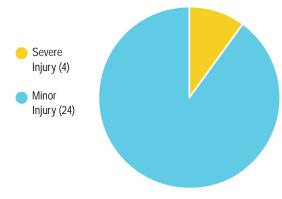


Figure 5. Pedestrian collision severity

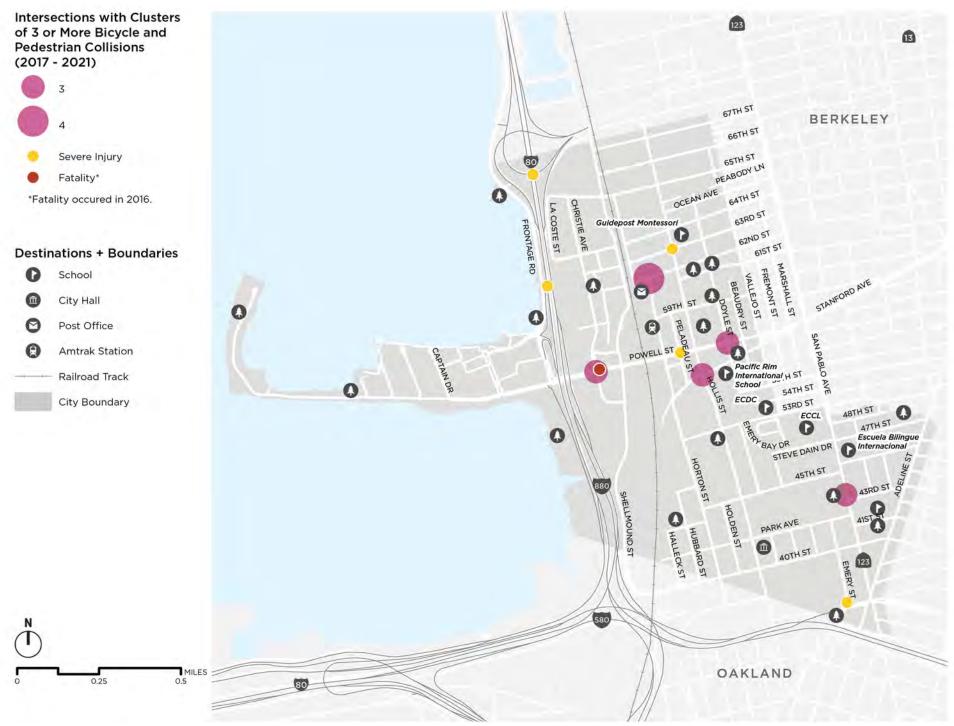
 One pedestrian fatality occurred in 2016—outside of the study period—at the intersection of Powell Street and Christie Avenue.

# **Collision Hotspots Analysis**

In this safety analysis, collision hotspots are defined as locations where three or more bicycle- or pedestrian-related collisions occurred. Five intersections throughout Emeryville were identified (Map 14).

- 62nd Street and Horton Street
- Powell Street and Christie Avenue
- Powell Street and Doyle Street
- Stanford Avenue and Hollis Street
- 43rd Street and San Pablo Avenue





### Connectivity

The Bicycle Level of Traffic Stress (BLTS) analysis in this Plan measures the perceived stress levels of people biking or rolling along Emeryville's roadways and shared-use paths. The less stressful—and therefore more comfortable—a biking and rolling facility is, the more accessible it will be to a larger portion of the population, both in age and ability. A biking and rolling network will be more comfortable if it is designed to reduce stress associated with potential vehicle conflicts.

Bikeways are considered low-stress if they involve very few traffic interactions by nature of the roadway's vehicle speeds and volumes (e.g., a shared low-traffic neighborhood street) or if there are greater degrees of physical separation between the bikeway and traffic lane (e.g., a separated bikeway on an arterial roadway). In order

to evaluate how well connected and comfortable Emeryville's existing bike network is, a BLTS analysis was performed on the city's street and trail network.

The BLTS analysis quantifies stress levels when a person is riding or rolling along a roadway, bike facility, or shared-use path. Inputs into how stressful a roadway or bikeway may feel include the number of traffic lanes, speed limit, presence of a bike facility, and presence of a physical separator between the bike facility and moving vehicles. The following levels of perceived stress, described by the type of bicyclist or roller the facility generally appeals to, were assigned to Emeryville's active transportation network:

- BLTS 1: All Ages and Abilities Corridor has a Class I Shared-Use Path or Class IV Separated Bikeway that provides a comfortable riding experience for all people biking or rolling.
- (Residential)

  Corridor is located within a residential area with low traffic speeds and low volumes that provides a comfortable onstreet riding experience for most people. Corridor may contain traffic calming, a

bicycle boulevard facility, or bike route.

**BLTS 1.5: All Ages and Abilities** 

BLTS 2: Average Adult
 Corridor provides a comfortable riding experience for an adult who bikes.

 Corridor may contain buffered bike lanes on an arterial roadway or bike lanes.

#### BLTS 3: Confident Adult

Corridor provides a comfortable riding experience for an experienced adult.

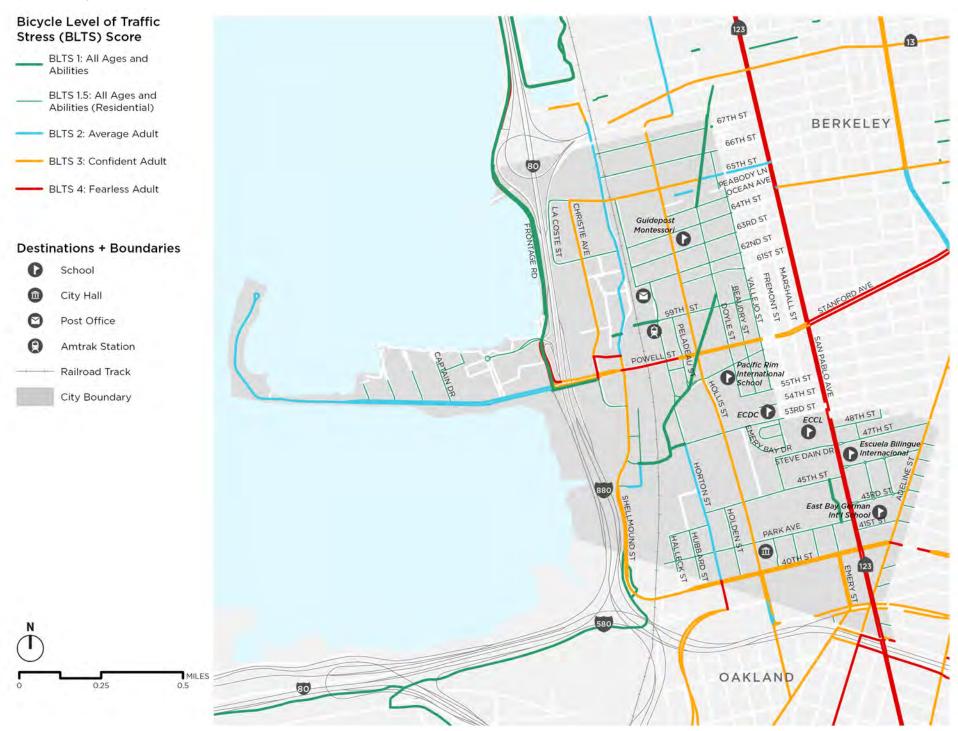
Corridor contains a bike facility with minimal separation from traffic such as a bike lane or bike route and hosts higher traffic speeds and volumes.

#### BLTS 4: Fearless Adult

Corridor is not comfortable for the majority of people biking. High traffic volumes, speeds, and multiple travel lanes without designated biking facilities are often barriers to people biking.

Emeryville's BLTS analysis revealed locations that are highly stressful for people biking and rolling, as well as areas where the low-stress network for all ages and abilities should be improved and better connected to popular destinations (Map 15). San Pablo Avenue and Powell Street emerged as the most stressful roadways to bike or roll on. Areas where low-stress

bikeways intersect these high-stress arterials, such as the intersection of 45th Street and San Pablo or Horton Street and Powell Street, emerged as places to be considered for spot improvements during the recommendations phase of the Plan. When considering Emeryville's existing low-stress network and the destinations it connects to, notable gaps include the Bay Street Shopping Mall, connections to the Bay Trail from north of Powell Street, and the commercial areas along 40th Street.



### **KEY TAKEAWAYS**

Four key takeaways emerged from the existing conditions and data analysis phase of the Plan:

### Arterial roadway crossings are stressful

The following arterial streets should be considered for crossing improvements and/ or parallel low-stress walking and rolling routes:

- ▶ 40th Street
- Powell Street
- San Pablo Avenue

### Focus area: San Pablo Avenue and Adeline Street

Residents with the lowest incomes live in the southeast corner of Emeryville on each side of San Pablo Avenue and Adeline Street. This area also has the highest population density, meaning that there is greater need and opportunity to serve the area with low-cost transportation options.

## Walking routes can be improved by removing identified barriers

Sidewalks with width restrictions near schools, community centers, transit corridors, and commercial areas should be considered for improvements to walkability.

## The existing bikeway network is not comfortable for all ages and abilities

Upgrading existing bikeways to lowerstress facilities and improving bicycle boulevard arterial crossings will make the rolling network more accessible to a wider audience.