BART Walk and Bicycle Network Gap Study

June 2020

EISEN | LETUNIC
Transportation, Environmental & Urban Planning and ARUP

in association with Parisi Transportation Consulting

This page intentionally left blank.

Acknowledgements

BART Technical Advisors

- Steve Beroldo, Customer Access
- Phaethon Brown, Transportation
- Tim Chan, Station Planning
- Ian Griffiths, Station Planning (former)
- Travis Huang, Civil Engineering
- Isaac Lim, Office of District Architect
- Hannah Lindelof, Station Planning
- Heath Maddox, Customer Access
- Serena Mau, Sustainability
- Val Menotti, Planning Chief
- Jumana Nabti, Customer Access
- Carl Orman, Office of District Architect (retired)
- Mariana Parreias, Station Planning
- Charlie Ream, Station Planning (former)
- Aron Rice, Civil Engineering
- Abby Thorne-Lyman, Real Estate
- John Wilson, Maintenance & Engineering

Project Team

- BART Gap Study Project Managers: Susan Poliwka and Kamala Parks
- BART Gap Study Advisor: Rachel Factor
- Consulting Study Project Managers: Victoria Eisen (Eisen|Letunic) and Megan Gee (Arup)
- Consulting Study Traffic Engineers: Andrew Lee (Parisi Transportation Consulting) and Alton Cannon (Arup)

Jurisdictional Stakeholders

12th Street, Coliseum & Fruitvale stations

- City of Oakland: Nicole Ferrara, Sarah Fine, Ed Manasse, Jason Patton
- Other stakeholders: Reginald "RB" Burnette, Tieri Killings (Scraper Bikes); Dave Campbell (Bike East Bay), Chris Hwang (Walk Oakland/Bike Oakland)

Ashby station

- City of Berkeley: Eric Anderson, Peter Chun, Kamala Parks, Alisa Shen, Beth Thomas
- Other stakeholders: Melanie Curry, Bike East Bay

Castro Valley station

- Alameda County: Art Carrera, Cindy Horvath, Paul Keener, Rick Yeung
- Other stakeholders: Bruce Dughi, Susie Hufstader (Bike East Bay); Jon Spangler (BART Bicycle Task Force)

Concord station

- City of Concord: Michael Cass, Abhishek Parikh, Joan Ryan, Laura Simpson
- Other stakeholders: Claire Linder (Bike Concord)

Dublin/Pleasanton and West Dublin/Pleasanton stations

- City of Dublin: Amy Million, Obaid Khan
- City of Pleasanton:, Cedric Novenario, Matt Nelson, Mike Tassano
- Other Stakeholders: James Paxson (Hacienda Business Park), Kristi Marleau (Bike East Bay); Sharon Piekarski, Bryan Bowers (Pleasanton Bicycle, Pedestrian, and Trails Committee);

El Cerrito Plaza station

- City of El Cerrito: Margaret Kavanaugh-Lynch, Melanie Mintz, Yvetteh Ortiz, Will Provost
- Other stakeholders: Mayor Janet Abelson, Shirley Cressey, Anh Nguyen (ADA Working Group); Dave Campbell (Bike East Bay)

Hayward & South Hayward stations

- City of Hayward: Damon Golubics, Ayeh Khajouei, Jeremy Lochirco, Sai Midididdi, Charmine Solla, John Stefanski, Liliana Ventura
- Other stakeholders: Susie Hufstader, Navpreet Khabra (Bike East Bay); Jianhan Wang (BART Bicycle Task Force)

Orinda station

- City of Orinda: Drummond Buckley, Scott Christie, Adam Foster, Kevin McCourt, Mayank Patel

(list continued on page ii)

Jurisdictional Stakeholders (cont'd)

Richmond station

- City of Richmond: Patrick Phelan
- Other stakeholders: Najari Smith (Rich City Rides)

San Bruno station

- City of San Bruno: Michael Kato, David Woltering
- Other stakeholders: Adam Cozzette, David Nigel (San Bruno BPAC)

San Leandro station

- City of San Leandro: Katie Bowman, Keith Cooke, Tom Liao, Michael Stella, Nick Thom
- Other Stakeholders: Susie Hufstader (Bike East Bay)

South San Francisco station

- City of South San Francisco: Jacob Gilchrist, Ernesto Lucero, Tony Rozzi, Matt Ruble, Ryan Wassum
- Town of Colma: Brad Donohue, Brian Dossey, Michael Laughlin
- Other Stakeholders: Emma Shlaes, Sandhya Laddha (Silicon Valley Bike Coalition); Otto Melara (Alta Planning + Design); Katie DeLeuw (BART Bicycle Task Force)

Union City station

- City of Union City: Mark Evanoff, Farooq Azim, Carmela Campbell

Contents

Chapters

Appendices

Figures

Tables

Global Recommendations

Station-Specific Recommendations

This page intentionally left blank.

1 | Introduction

The BART Walk and Bicycle Network Gap Study ("Gap Study") documents a planning process that took place in 2017-2020. It identifies conceptual access improvements to make walking and biking to and from the following 17 BART stations safer and easier.[1]

- 12th Street/ Oakland City Center
- Ashby
- Castro Valley
- Coliseum
- Concord
- Dublin/ Pleasanton
- El Cerrito Plaza
- Fruitvale
- Hayward
- Orinda
- Richmond
- San Bruno
- San Leandro
- South Hayward
- South San Francisco
- Union City
- West Dublin/ Pleasanton

The Gap Study also includes a set of "Global Recommendations" that may apply to all BART stations (including the Focus Stations), and a toolkit that illustrates and further explains the station-specific recommended strategies.

This Study is not meant to substitute for station access or station area plans, which typically address all modes of transportation to, from and within the station area; rather, this study set out to identify the highest impact, near-term improvements to walk and bike station access. Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand.[2]

The study was undertaken in response to the following landmark activities, both of which took place in 2016:

BART Station Access Policy: Adopted by the BART Board of Directors on June 9, 2016, this policy guides the District's access practices and investments through 2025. It advances the region's safety, public health, greenhouse gas (GHG) and pollution-reduction goals, thus making access to BART safer, healthier and greener. The policy includes a station access design hierarchy, station access typology and corresponding investment matrix (Figures 1.1 and 1.2), which together identify the primary and secondary access modes BART will support and encourage at each station. The BART Board adopted the policy's performance measures and targets on December 1, 2016, setting a systemwide target of 52 percent active access by 2025.

The BART Station Access Policy prioritizes walk and bicycle station access, or "active access." This study aims to help BART implement its Station Access Policy by:

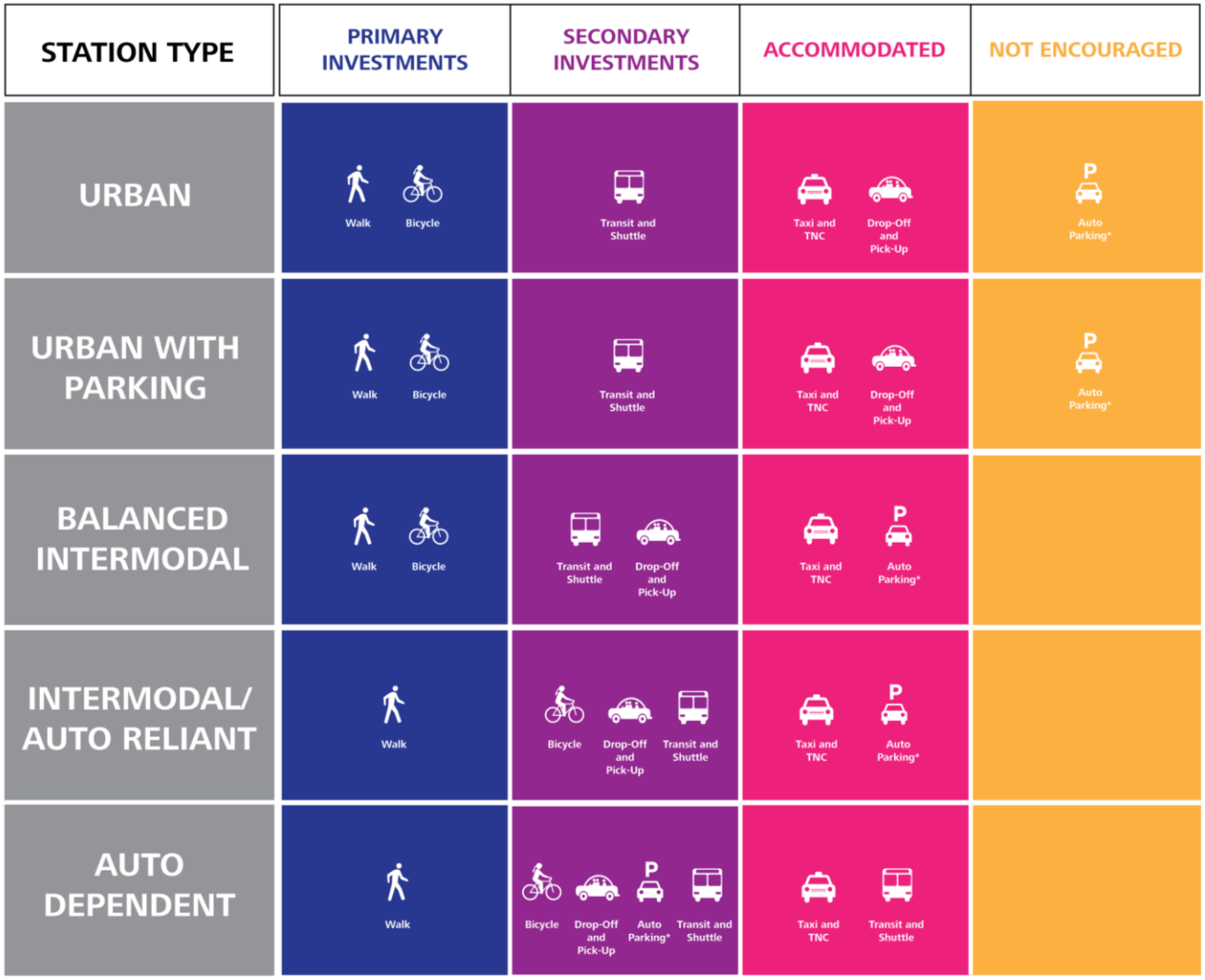
- Supporting systemwide plans to increase walking and biking to stations
- Partnering with local and other interested stake-holders to improve station access on foot and by bike.

Measure RR bond: Passed by the voters also in 2016, Measure RR allows BART to issue bonds to rebuild its aging system. The measure includes up to $135 million to deliver capital projects to expand opportunities to safely access BART stations, of which 57 percent has tentatively been allocated to active access projects. Understanding that BART's purview for improving active access is limited to its property, BART has set aside approximately $25 million for a Safe Routes to BART (SR2B) grant program intended to help partner agencies implement active transportation projects off of BART property.

[1] The Gap Study scope did not include evaluating station access by public transit or for passengers with disabilities.

[2] See 2017 BART Bicycle Program Capital Plan for details.

Figure 1.1 | **BART Station Access Investment Framework**



BART Station Access Policy, adopted June 9, 2016

Primary Investment: BART will prioritize investments of funds and staff time on and off of BART property, consistent with access goals; priority projects best achieve policy goals, focus on safety and sustainability

Secondary Investment: BART will invest funds and staff time on and off of BART property, consistent with policy goals; secondary investments balance policy goals.

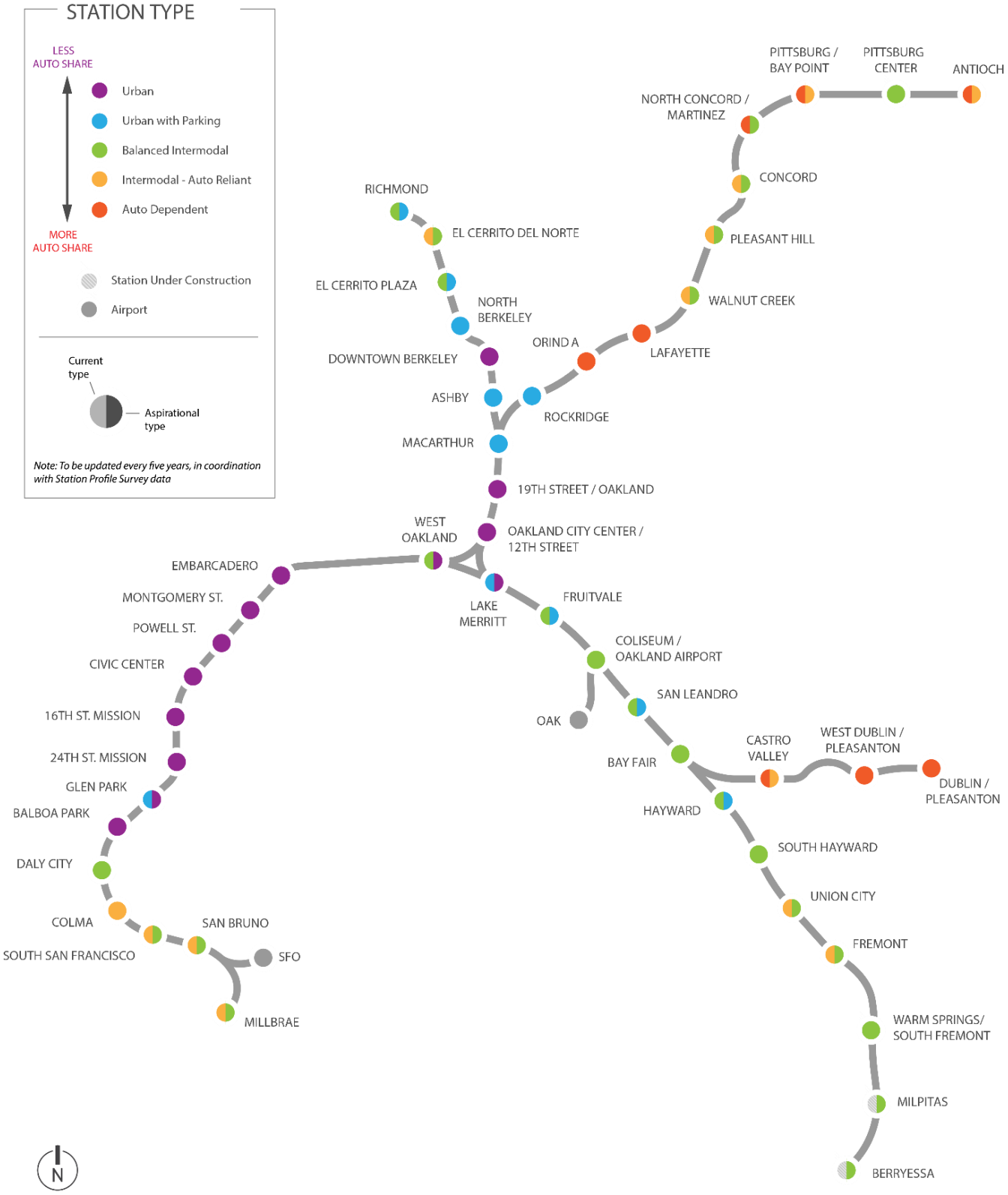
Accommodated: BART will maintain and manage existing assets, and partner with other access providers as needed.

Not Encouraged: BART will not invest in construction of parking expansion

Notes:

- TNC: Transportation Network Company (ride-hailing services, e.g., Uber and Lyft)
- Parking management is a secondary investment at all stations with parking
- Parking replacement for development to be determined by BART's Transit-Oriented Development (TOD) Policy

Figure 1.2 | **BART Station Access Typology Map**



BART Station Access Typology Map, updated November 15, 2018

Study Process

The Gap Study process was guided by technical advisors comprised of BART staff. Jurisdictional staff and other stakeholders were also key participants in developing the station-specific recommendations. See Acknowledgements for the roster of participants. The process of developing the Gap Study's recommendations consisted of the following steps:

1. **Analyze and Rank Stations:** The project team conducted a systemwide review of station area characteristics, which included station access mode, land use context, surrounding network conditions (including pedestrian and bicycle collisions) and socioeconomic equity. To inform the selection of Focus Stations to study, a scoring system was developed as a proxy for identifying where there may be the most potential for meaningful impact on walking and biking. Development of the ranking process revealed that maximizing the weight of criteria that reflect two key desired outcomes of this study—increasing the number and share of BART customers who walk and bike to stations, and targeting stations with high rates of nearby fatal and severe bicycle and pedestrian injury collisions (relative to the number of customers that walk and bike to those stations)—best achieved maximum socioeconomic equity, a diversity of station access typologies and distribution across counties.
2. **Select the Focus Stations**: Stations with recent, current or near-future access studies were eliminated from consideration to be a Focus Station. The remaining stations were selected based on local jurisdictions' interest and availability to participate. The final number of stations was determined by funding availability.
3. **Interview local jurisdictional staff:** Conference calls identified local plans or planned projects that would affect walking and biking near each station.
4. **Conduct site visits**: Walking tours were conducted of each station and its environs. Local jurisdictional staff, BART staff, walk and bike advocates, and other interested parties participated to identify obstacles to walking and biking.
5. **Develop initial recommendations**: The consultant team developed an initial set of improvements, which were refined by BART staff and reviewed by jurisdictions and other site visit participants.
6. **Finalize the study**: The station-specific recommendations were refined, mapped and consolidated with a set of Global Recommendations for all stations and a toolkit of station-specific recommendations. Local jurisdictional staff and other site visit participants were given another opportunity to review, and BART staff finalized the study.

Study Components

The BART Walk and Bicycle Network Gap Study comprises the following components, each corresponding to a separate chapter in this document.

Station-Specific Recommendations (Chapter 2)

Chapter 2 presents the process used to develop recommendations to improve walk and bike access at each of the 17 Focus Stations, and identifies the specific recommendations that local jurisdictions and BART can accomplish in the relative near term to improve walking and biking between the surrounding area and Focus Station entrances. This chapter is based on the site visits and input from BART and local jurisdiction staff, walk and bike advocates, and consultant team analysis.

Global Recommendations (Chapter 3)

Chapter 3 outlines ten types of improvements that are likely needed at all seventeen Focus Stations, and potentially systemwide.

Toolkit of Station-Specific Recommendations (Chapter 4)

To support design and implementation, Chapter 4 presents a toolkit of treatments recommended at one or more Focus Stations, illustrated by photographs, descriptions and references.

Implementation

Implementation of the BART Walk and Bicycle Network Gap Study's station-specific and global recommendations will fall to the agency with jurisdiction where they're needed, either the municipality, county or, if within a station boundary, BART. In either case, options to put these projects on the ground include:

- **Piggyback on other projects or routine maintenance:** For instance, roadway resurfacing projects can include crosswalk, bike lane and other striping. Traffic signals can be made more pedestrian- or bicycle-friendly when they are installed or upgraded for other reasons.
- **Fund with local resources:** Sales tax set-asides and other local sources earmarked for transportation improvements can pay for projects, particularly those unlikely to attract grant funding.
- **Apply for grant funding:** Countywide transportation authorities, the Metropolitan Transportation Commission and the State of California all offer grant programs that support projects to improve walking and biking, particularly safety projects and those that serve economically disadvantaged communities. The Measure RR Safe Routes to BART (SRTB) program also provides construction funding for these types of projects.
- **Integrate into transit-oriented development:** The Bay Area housing crisis, the BART Board's commitment to build housing at its stations and efforts to pass state legislation mean that more development is being built at and near BART stations. These projects offer the opportunity for BART and local jurisdictions to require developers to provide and be responsible for maintaining many of the improvements recommended in this study.
- **Include in Multimodal Access Design Guidelines (MADG) update:** Some of the recommendations from this study are included in BART's Multimodal Access Design Guidelines; however, others will need to be added when the MADG are updated.

How to Use This Report

The BART Walk & Bicycle Gap Study provides three types of information:

- **Station-specific recommendations** at the 17 focus stations to guide near-term efforts to improve access to these stations (Chapter 2).
- **Global recommendations**, which should be considered for all stations (Chapter 3).
- **A Toolkit** that provides more specified guidance for and illustrations of the station-specific recommendations (Chapter 4).

This page intentionally left blank.

2 | Station-Specific Recommendations

This chapter provides specific recommendations for making walking and biking safer, easier and more comfortable at each of the 17 Focus Stations. A section for each station provides station area context, access conditions, related planning efforts, and a map and list of the study's recommended station-specific improvements. These recommendations focus mostly on near-term, implementable active access enhancements, consistent with the goal of this effort. Changes to be considered at all stations systemwide are presented in Chapter 3, Global Recommendations. Chapter 4 provides a Toolkit of information about the improvements recommended at individual stations in this chapter.

Process of Developing Station-Specific Recommendations

Once the Focus Stations were chosen (see Chapter 1), staff from each jurisdiction with one or more Focus Stations were introduced to the project and invited to participate in site visits with BART staff, members of the BART Bicycle Task Force (BBTF), the consultant team, local walk and bike advocacy group representatives, and anyone else the jurisdictions wanted to include.

The site visits were guided by maps of the quarter-mile radius surrounding the stations, displaying the walking route, which generally covered the periphery of each station, and walk and bike collision hotspots within a quarter-mile of the fare gates (see Appendix A for maps showing collision locations near each station). During the visits, the group discussed typical/desired walk and bike routes, challenges to walking and biking to and from the station, and corresponding ways to make walk and bike access safer and more inviting and comfortable. Since the site visits took place during the day, nighttime conditions, such as dark areas, were not evaluated.

The BART Walk and Bicycle Network Gap Study is not meant to substitute for station-area plans or pedestrian and bicycle plans around the Focus Stations; rather, it set out to identify the most apparent near-term improvements to walk and bike access. Following the site visits, the project team identified specific improvements to address issues observed or raised during the site visits, and developed a list of ten "Global Recommendations" that are needed at all stations (see Chapter 3). Lists of the draft station-specific recommendations and maps of their locations were sent to the site visit participants for their review. These included projects to facilitate walking (designated with a "P" for pedestrian); bicycling (designated with a "B"); and both ("PB").

The recommendations in this chapter reflect, to the greatest extent possible, access improvements that are supported by all reviewers. Table 2.1 presents station access characteristics for each Focus Station, such as the BART station access type, walk and bike rates and collisions, and the proportion of nearby households that are low-income (see following pages). A table of the acronyms used in this chapter appears on page 9.

Table 2.1 | Focus Station Characteristics

Station	Daily Station Entries[1]	County[2]	Station Access Type[3]		Access Mode[4]		Collisions[5]						Equity
							Walk			Bike			
			Current	Aspiration	Walk	Bike	Total # within ½ mile	Fatal + Severe	Fatal + Severe Index[6]	Total # within ½ mile	Fatal + Severe	Fatal + Severe Index[6]	% of low-income households within ½ mile of station[7]
12th Street	14,195	ALA	URB	URB	81%	3%	228	12	0.10	86	6	1.29	66%
Ashby	6,030	ALA	UPG	UPG	60%	12%	130	2	0.05	100	4	0.50	48%
Castro Valley	3,106	ALA	ADP	IAR	31%	8%	28	4	0.38	14	1	0.37	46%
Coliseum	7,703	ALA	BIM	BIM	39%	8%	17	6	0.18	6	0	0.00	77%
Concord	6,634	CCC	IAR	BIM	24%	5%	43	8	0.46	24	3	0.83	51%
Dublin/ Pleasanton	7,967	ALA	ADP	ADP	15%	5%	15	3	0.23	15	1	0.23	12%
El Cerrito Plaza	5,055	CCC	BIM	UPG	43%	6%	23	2	0.08	13	2	0.60	33%
Fruitvale	8,966	ALA	BIM	UPG	38%	11%	138	16	0.43	43	5	0.46	63%
Hayward	5,592	ALA	BIM	UPG	29%	6%	70	2	0.11	26	3	0.82	48%
Orinda	2,909	CCC	ADP	ADP	16%	4%	2	0	0.00	2	0	0.00	24%
Richmond	4,746	CCC	BIM	UPG	37%	6%	24	4	0.21	19	2	0.64	63%
San Bruno	3,975	SMC	IAR	BIM	40%	6%	22	0	0.00	10	2	0.77	33%
San Leandro	6,093	ALA	BIM	UPG	43%	9%	55	7	0.24	55	0	0.00	41%
South Hayward	3,469	ALA	BIM	BIM	25%	6%	23	6	0.63	23	0	0.00	39%
South San Francisco	3,681	SMC	IAR	BIM	37%	4%	4	0	0.00	4	0	0.00	25%
Union City	5,167	ALA	IAR	BIM	23%	5%	18	1	0.08	18	1	0.35	16%
West Dublin/ Pleasanton	3,708	ALA	ADP	ADP	26%	3%	16	2	0.19	16	0	0.00	19%
Systemwide totals/ averages (43 stations[8])	8,550	---	---	---	36%	7%	N/A			N/A			43%

(See facing page for table footnotes.)

Table 2.1 Footnotes

1. Source: 2015 BART Station Profile Study (www.bart.gov/about/reports/profile)
2. County abbreviations: Contra Costa County (CCC); Alameda County (ALA); San Mateo County (SMC)
3. URB: Urban; UPG: Urban with Parking; BIM: Balanced Intermodal; IAR: Intermodal Auto-Reliant; ADP: Auto-Dependent.
4. Source: 2015 BART Station Profile Study. Access Mode includes home- and non-home-based walk and bike access, with the exception of Orinda, which lists only home-based walk-bike access. The Station Access Policy has a systemwide target of 52% for active access to stations by 2025.
5. Source: California Statewide Integrated Traffic Records System (SWITRS) using the most recent three-year period available at the time of the site visits, as follows:
    - 2013-2015: 12th Street, Ashby, Castro Valley, Coliseum, Concord, El Cerrito Plaza, Fruitvale, Hayward, Richmond, San Bruno
    - 2015-2017: Dublin/Pleasanton, Orinda, San Leandro, South Hayward, South San Francisco, Union City, West Dublin/ Pleasanton
6. Fatal + Severe Index is the number of fatal and severe collisions involving pedestrians or bicyclists divided by their respective daily station entries over three years per 100,000 rides.
7. Source: American Community Survey (ACS). Low-income households are defined as earning less than $50,000 annually, using the most current data available at the time of the site visits, as follows:
    - 2015 ACS: 12th Street, Ashby, Castro Valley, Coliseum, Concord, El Cerrito Plaza, Fruitvale, Hayward, Richmond, San Bruno
    - 2017 ACS: Dublin/Pleasanton, Orinda, San Leandro, South Hayward, South San Francisco, Union City, West Dublin/Pleasanton
8. Excludes stations that opened since the study began (Warm Springs, Pittsburg Center, Antioch, Berryessa and Milpitas), and the airport stations (OAK and SFO).

Table 2.2 | Acronyms Used in Chapter 2

Acronym	Term
EBR	Eastbound right
FHWA	Federal Highway Administration
FY	Fiscal year (BART's runs July 1 -June 30)
HV	High visibility
MADG	Multimodal Access Design Guidelines
MUTCD	Manual on Uniform Traffic Control Devices
NACTO	National Ass'n of City Transportation Officials
NB	Northbound
NBL	Northbound left
NBR	Northbound right
PHB	Pedestrian Hybrid Beacon

Acronym	Term
ROW	Right of way
RRFB	Rectangular Rapid Flashing Beacon
SB	Southbound
SBL	Southbound left
SBR	Southbound right
SFMTA	SF Metropolitan Transportation Agency
SR	State Route
UPRR	Union Pacific Railroad
WB	Westbound
WBL	Westbound left
WBR	Westbound right

12th Street Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Change
Walk	82%	81%	11,001	11,520	5%
Bike	1%	3%	159	437	175%

Overall entries at this station by all modes increased by 6% between 2008 and 2015. Station entries by passengers who walked increased despite decreasing mode share due to increasing ridership.

Current/Aspirational BART Station Access typology: Urban/Urban
Average weekday station exits (2019): 13,908
Parking inventory (bike/auto): 42/0

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

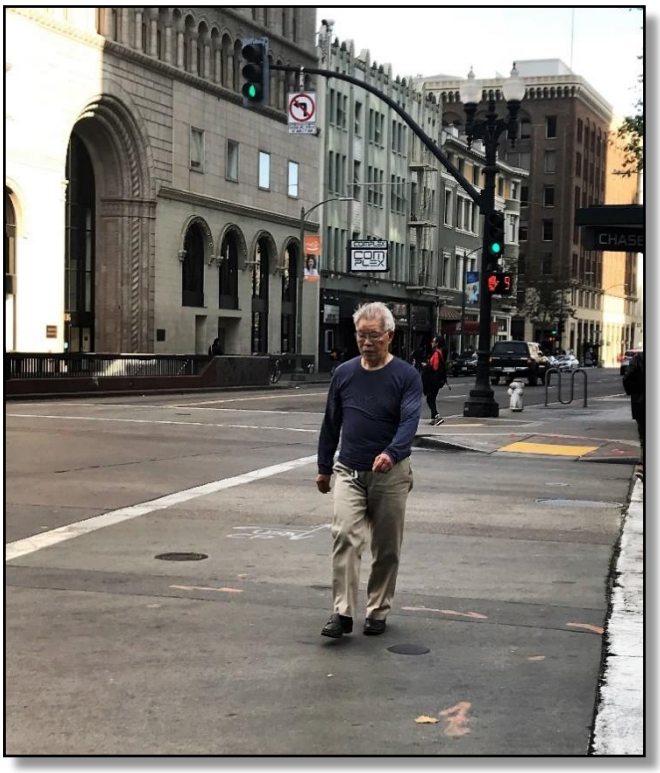
12th Street is downtown Oakland's primary BART station, used by more passengers than any station outside of San Francisco. This underground station has three entrances spread between 11th and 14th Streets, including one at Frank Ogawa Plaza, steps from City Hall. There will be an important East Bay Bus Rapid Transit (BRT) stop at the station, which is surrounded by office buildings, retail and restaurants, and, on the west side of I-980 and in Chinatown to the east, residential neighborhoods. Two-thirds of households within a half-mile of the station earn less than $50,000 per year, a higher proportion of lower-income residents than the systemwide average (see Table 2.1). The 12th Street Station has the fifth highest ridership out of 48 station in the BART network, based on the 2019 ridership report.

Station Area Access

12th Street is the only Focus Station with no BART-owned automobile parking. The City of Oakland provides a small number of bike racks and electronic bike lockers on Frank Ogawa Plaza. According to BART's station profile studies, 81 percent of passengers accessed the 12th Street station on foot and three percent by bike in 2015 (the most recent year for which data is available; see table at left). In part due to increasing ridership from the station, there are growing numbers of people walking and biking in the station area. (Since these statistics were collected, three bike share stations were installed near station entrances, which may have increased the station's bike access rate.)

Collisions between motorists and people on bikes and on foot occur throughout downtown Oakland, with a particularly high concentration of pedestrian collision hotspots along Broadway between the 11th and 14th Street BART entrances. There were seven fatal pedestrian collisions within a quarter-mile of a station entrance and four fatal collisions involving someone on a bicycle within a half-mile of a station entrance between 2013 and 2015 (see Appendix A). No pedestrian collisions are acceptable; however, the high number of collisions involving people crossing Broadway on foot in the vicinity of 12th Street BART may be more indicative of the high number of pedestrians in the area than a higher than average collision rate (i.e., collisions per pedestrian).

The origins and destinations of patrons using BART for non-home-based trips are overwhelmingly within a few blocks of the station; however, people do walk and bike between the station and more remote destinations, such as Jack London Square, a quarter-mile to the south. Passengers who walk and bike from home to the 12th Street station live in all directions, including some that may be closer to the Lake Merritt or 19th Street stations. These customers may use 12th Street nonetheless because, unlike Lake Merritt, it is a transfer station, which provides more frequent trains that serve a greater number of destinations than Lake



Location of Recommendation P3: Broadway and 14th Street

Merritt station. Bike trips to this station tend to originate beyond the typical half-mile radius, particularly from west Oakland and the south side of Lake Merritt.

The unclean walking environment around the 12th Street BART station may discourage people from walking to the station. The long crossing distances across Broadway and the fast-moving one-way traffic on many downtown streets may also contribute to an unsafe-feeling walking environment. The shortage of secure bicycle parking in the station area both limits the number of passengers who bike to this station and increases the number who bring their bikes aboard trains, something BART allows at all times, but discourages, particularly at busy stations like 12th Street.[3]

[3] BART is pursuing secure bike racks for the station's concourse level.

Station Area Planning

The 12th Street station currently has an Urban BART station access typology designation, which is not anticipated to change.

The City's 2017 Pedestrian Plan identifies the intersections of Broadway with 9th, 12th and 14th Streets in the vicinity of the BART station as four of the City's 34 high-injury corridors, which the plan calls the City's "most dangerous streets." Concurrent with this Walk and Bicycle Network Gap Study, the City of Oakland was carrying out a planning process for a Downtown Oakland Specific Plan, of which improving walk and bike facilities in the vicinity of 12th Street BART is an important component.

Location of Recommendation P4: 11th Street at Broadway

Recommendations

The BART system relies on the 12th Street station for a significant portion of its ridership and revenue. There could be opportunities for the BART District, whose headquarters are less than a half-mile away, to be an advocate for access improvements that serve the

station through a closer relationship between the BART Board of Directors and the Oakland City Council; BART staff participation in an advisory role in City planning activities; and providing staff and financial resources Oakland needs to deliver access improvement projects.

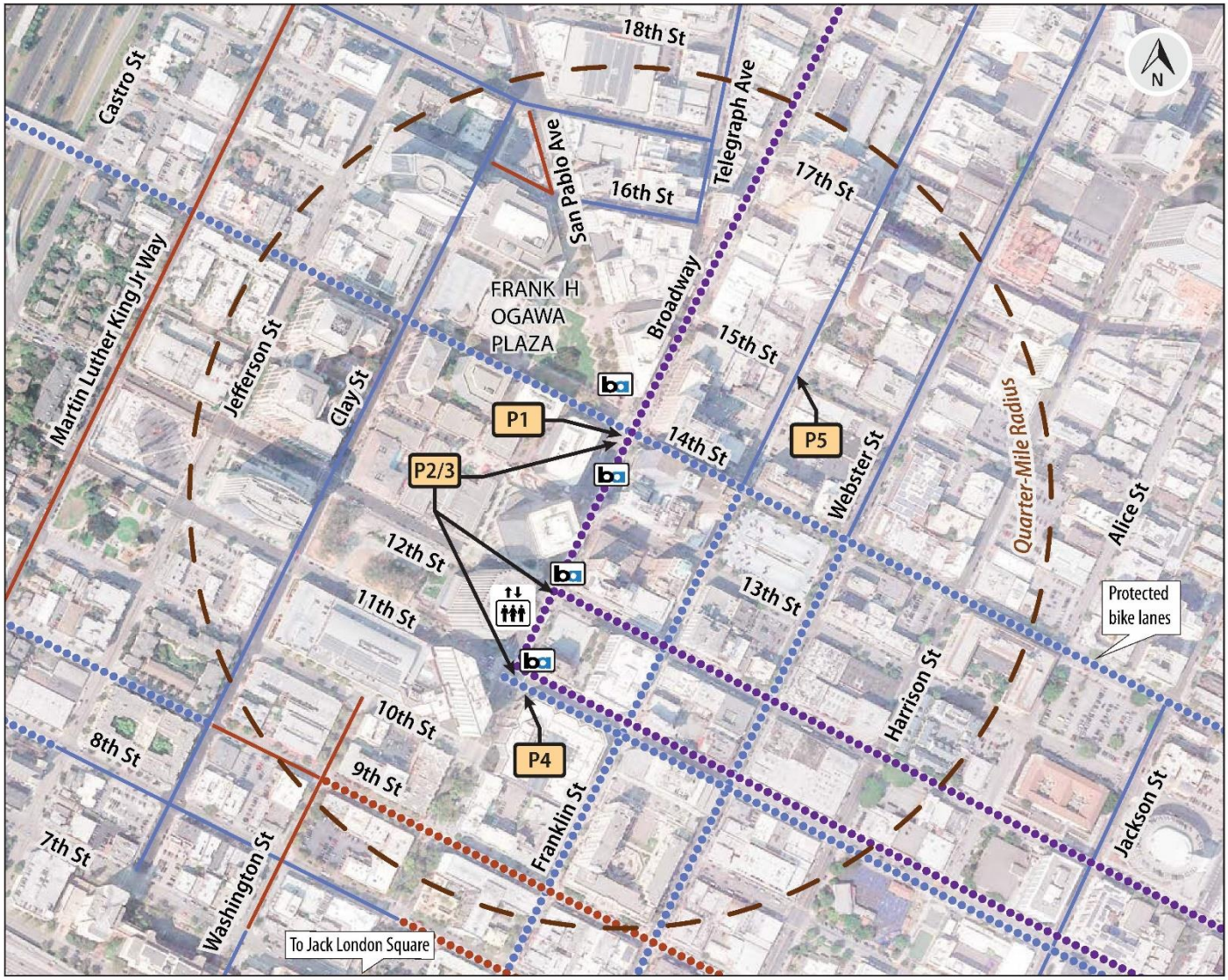
A more welcoming and safer-feeling walking environment, better on-street bike facilities, and secure bicycle parking near station entrances will encourage more people to walk and bike to the 12th Street station, and more to leave their bikes at the station. AC Transit's BRT project, currently under construction, will make pedestrian improvements to the area, including directional curb ramps, code-compliant pedestrian signal push buttons and improved lighting (see global recommendations in Chapter 3). In the midst of intensive local planning at the 12th Street BART station, station-specific recommendations are limited to addressing the following near-term pedestrian issues encountered on the station tour:[4]

- **Pedestrian improvements on Broadway:** P1, P2 and P3 all make crossing Broadway safer and more convenient.
- **Bus improvement:** P4 looks at improving lighting at the well-used bus stops on 11th Street between Broadway and Franklin Street.
- **Other:** P5 upgrades the traffic signal equipment to provide standard (12") vehicle signal heads and add pedestrian countdown signals at the intersection of Franklin and 15th Streets.

[4] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

This page intentionally left blank.

Figure 2.1 | **12th Street Station Map**



2020

LEGEND

Existing | Planned by City

- Class II Bike Lane
- Class III / Bike Boulevard
- Bus Rapid Transit line
- BART Station Entrance
- BART Elevator

Recommended

- P# Pedestrian Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

12TH STREET STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **Broadway/14th St** | Consider pedestrian scramble

P2 **Broadway/11th St to 14th St** | Automatically activate a pedestrian signal phase during the corresponding vehicle phase, without the need to press a button, consistent with Oakland's signal timing policy. Would require reconsidering signal timing planned for future bus rapid transit. Also consider providing leading pedestrian interval to pedestrian signal phases.

P3 **Broadway/11th St to 14th St** | Stripe high-visibility crosswalks (all four legs).

P4 **11th St, Broadway – Franklin** | Study opportunity to improve lighting for bus stop.

P5 **Franklin St/15th St** | Upgrade signal equipment to 12" vehicle signal heads and add pedestrian countdown signals.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Ashby Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Change
Walk	53%	60%	2,543	3,630	43%
Bike	11%	12%	540	712	32%

Overall entries at this station by all modes increased by 26% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Urban with Parking/Urban with Parking
Average weekday station exits: 4,984
Parking inventory (bike/auto): 316* / 603
*including 128 self-serve bike station spaces

Sources
- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The Ashby station is the southernmost of Berkeley's three BART stations. It is located on a triangular island bordered by three busy, multi-lane arterials: Adeline Street, Martin Luther King Jr. Way and Ashby Avenue, a state highway. Significant trip generators in the area are the Ed Roberts Campus on Adeline, which houses the offices of numerous organizations that serve people with disabilities, a small commercial area clustered around the Ashby/Adeline intersection, and residential neighborhoods surrounding the station. The primary station entrance is in the auto parking lot, adjacent to the bike station. The other entrance is from the Ed Robert Campus building's basement level, which is also accessible via a stairway and elevator on the east side of Adeline Street. Forty-eight percent of households within a half-mile of the station earn less than $50,000 annually, higher than the systemwide average (see Table 2.1). Ashby Station has the 29th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Station Area Access

The Ashby BART station is the only station in this study where the ratio of bicycle to automobile parking spaces is over 50 percent. Most of the auto parking is located west of the station, with a small auto parking lot east of the station (east of Ed Roberts Campus). The majority of the bike parking is also located on the west side of the station, including a self-serve bike station just south of the main BART entrance and plentiful racks and electronic bike lockers just north of the entrance. There are also electronic bike lockers on the west side of Adeline, just above the station, and a set of bike racks behind the Ed Roberts Campus. A bike-share station was installed after these statistics were collected, which may have increased the bike access rate.

According to BART's station profile studies, 60 percent of passengers accessed the Ashby station on foot and 12 percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership at the station, there are growing numbers of people walking and biking in the station area.

BART passengers who walk to the Ashby station come evenly from all directions, reflective of the relatively uniform density and topography of the

Location of Recommendation P9: Ashby Avenue at Otis Street

surrounding neighborhoods. Customers who bike come primarily from the west and the nearby north, most likely due to the station's proximity to the Downtown Berkeley station to the north, Rockridge station to the southeast and MacArthur station to the south. The Milvia bicycle boulevard[5] provides a comfortable, low-traffic route from far North Berkeley through downtown, which ends at Russell Street, one block north of Ashby BART. The City of Berkeley has improved walking conditions to the station by adding flashing pedestrian beacons and high-visibility crosswalks at key crossings of Martin Luther King and Adeline. Nevertheless, with the exception of those who choose the underground access route from the Ed Roberts campus, passengers who walks or bikes to or from the Ashby BART station must cross at least one very busy, multi-lane roadway. In many cases, the most direct route is via an unsignalized intersection. Other than the Ed Roberts passageway beneath Adeline, there are no protected routes for either mode from any direction.

There are numerous pedestrian collision hotspots focused on Ashby Avenue, at MLK and Otis Street, which is an unmarked T-intersection, and on Adeline in front of the Ed Roberts Campus, which is directly accessible from the station via an underground passageway. There was a pedestrian fatality on Adeline at Fairview Street, just south of the station, but outside of the walking tour area. Bicycle collision hotspots are at Alcatraz and Shattuck Avenues, and along the Milvia Street bike boulevard near where it ends north of the station. There were four fatalities involving bicyclists within a half-mile of the station (see Appendix A).

Station Area Planning

The Ashby station currently has an Urban with Parking station access typology designation, which is not anticipated to change in the foreseeable future.

Location of Recommendation P1: Ashby Avenue/ Adeline Street

During the course of this study, the City was managing the development of the Adeline Corridor Plan, whose study area includes the Ashby station area. That effort is developing a long-term vision that could include a two-way north/south greenway along the west side of Adeline Avenue, as well as near-term improvements that are consistent with this study's recommendations. The Adeline Corridor planning process is also considering potential mixed-use development with primarily housing on the west and east Ashby BART parking lots. This transit-oriented development (TOD) could entirely change the routes people using all modes will take to reach the fare gates and bike parking. If built, this development should be designed to welcome people walking and biking to the station with direct, protected, well-signed and well-lit routes. If the TOD provides auto parking, driveways should be aligned 90 degrees to the roadway to reduce pedestrian crossing distances. (Currently, the MLK driveways are skewed, which increases pedestrian crossing distances, and makes it more difficult for motorists exiting the site to see people on the sidewalk.)

The 2017 Berkeley Bicycle Plan and 2010 Berkeley Pedestrian Master Plan also provide guidance for the Ashby BART station area, which are reflected on the Ashby station map as "Planned" improvements.

[5] A bicycle boulevard is a low-speed, low-volume street that has been optimized for bicycle traffic. Bicycle boulevards discourage cut-through motor-vehicle traffic but allow local motor-vehicle traffic. They are designed to give priority to people biking as through-going traffic. (www.cityofberkeley.info/bicycleboulevards)

Adeline Avenue is slated for resurfacing, which could provide an opportunity to better link Milvia with the BART station by continuing the existing Adeline bike lanes through the Ashby intersection, an improvement that Caltrans also recommends, in its District 4 Bicycle Plan.

Recommendations

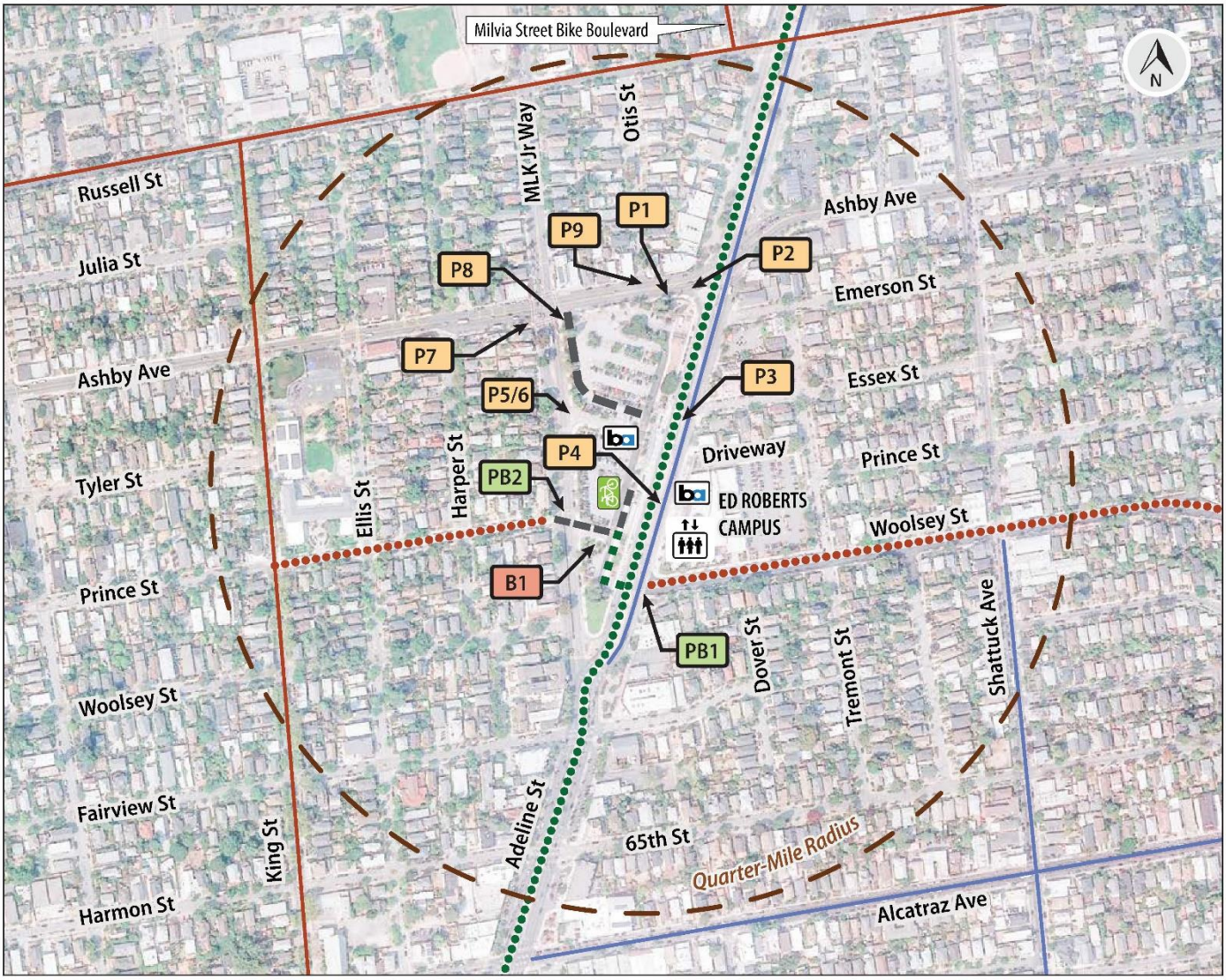
Near-term improvements are recommended on all three sides of the Ashby station: [6]

- **Ashby side:** P1 and P8 make improvements to the experience of entering the parking lot by bike and on foot from the northeast from Ashby Ave near Adeline and Otis Streets. P1 allows the northeast gateway to the station to better relate to the adjacent crosswalk and will create a more direct route to the sidewalk that runs along the eastern edge of the parking lot and fare gates. P8 creates a station gateway at the northwest corner and sanctioned route through the parking lot to the fare gates. P2 requires eastbound Ashby Ave.-to-southbound Adeline St. motorists to stop before driving across the crosswalk at the Adeline corner. This right turn lane is needed because trucks will not be able to turn right around the island. P9 creates a new pedestrian crossing at Otis, and P7 shortens the crossing distance across MLK and Ashby
- **Adeline side:** P3 helps protect people crossing Adeline at Essex by adding a pedestrian refuge. P4 guides passengers with visual disabilities who choose to cross Adeline at grade through the middle of the crosswalk that leads to Ed Roberts. PB1 makes crossing Adeline at Prince to reach the BART driveway safer, connecting to B1, which creates a new bikeway from the driveway into the station and to the bike station and fare gates.
- **Martin Luther King Jr. Way side:** PB2 makes the same improvements to MLK that PB1 makes to Adeline to allow people to bike and walk safely into the BART parking lot from Prince Street, a bicycle boulevard. P5 narrows the BART driveway to slow down entering and existing motor vehicles and to shorten pedestrian crossing distance. P6 eliminates the acceleration and deceleration lanes on northbound MLK on either side of the BART driveway to calm traffic and improve the pedestrian crossing of MLK.

[6] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

This page intentionally left blank.

Figure 2.2 | **Ashby Station Map**



2020

LEGEND

Existing | Planned by City		Recommended	
	Class II Bike Lane		Route TBD
	Class III / Bike Boulevard		Class IV Separated Bikeway (2-Way)
	Class IV Separated Bikeway (2-Way)	P#	Pedestrian Improvement
	BART Station Entrance	B#	Bicycle Improvement
	Bike Station	PB#	Ped & Bike Improvement
	BART Elevator		

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

ASHBY STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **Ashby Ave / Adeline St** | Create prominent gateway to station & improve walking connection on BART property between corner & station, including aligning entrance with crosswalks, more landscaping and gradual/fewer switchbacks. (BART)

P2 **Ashby Ave / Adeline St** | Install stop sign/bar.

P3 **Adeline St / Essex St** | Consider shortening left turn pocket to Ed Roberts parking to allow space for a pedestrian refuge at Essex St crossing.

P4 **Adeline St / Ed Roberts Campus crossing** | Add tactile path along center of existing crosswalk.

P5 **North BART driveway (at MLK)** | Narrow BART driveway and remove pork chop. (BART)

P6 **MLK / North BART driveway** | Remove deceleration and acceleration lanes on northbound MLK north and south of north BART driveway.

P7 **Ashby Avenue / MLK (SW corner)** | Create bulbout (requires Caltrans approval).

P8 **Ashby Ave / MLK** | Create gateway to station & stripe routes through parking lot directly to station entrance. (BART)

P9 **Ashby Ave / Otis St** | Consider creating new high-visiblity crossing (requires Caltrans approval). City Pedestrian Plan calls for it to be on the west leg and include bulbouts (on south side of Ashby). If/when BART parking lot is developed, require connection from Otis to bike station.

Bicycle Safety & Access

B1 **Prince St / Adeline St / Woolsey St** | Create a 2-way cycle track through BART parking lot (requiring driveway widening) to connect MLK/Prince St. crossing with bike station. Construct 2-way cycle track or a downhill contraflow lane and uphill shared roadway between Adeline & bike station depending on feasibility.

Pedestrian and Bicycle Safety & Access

PB1 **Adeline St/Woolsey St** | Install pedestrian hybrid beacon, refuge island & intersection crossing markings for bikes.

PB2 **MLK / Prince St** | Install pedestrian hybrid beacon, refuge island & intersection crossing markings for bikes.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Castro Valley Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	17%	31%	422	968	129%
Bike	3%	8%	82	257	213%

Overall entries at this BART station by all modes increased by 23% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Auto-Dependent / Intermodal/Auto-Reliant **Average weekday station exits**: 2,797
Parking inventory (bike/auto): 99 / 1,118

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The Castro Valley BART station is located in Castro Valley, an unincorporated community in central Alameda County. The station is in the I-580 median, so the platform is elevated. There is a single station entrance, off of Norbridge Avenue, a County-owned road that functions as a BART access road, running through BART property, with auto parking on either side. There are bike racks and electronic bike lockers located on the BART plaza and along the busway. The station is isolated from the residential areas to the south and east by the freeway and Redwood Road, a six-lane arterial, respectively. Other than the Castro Village Shopping Center and other commercial development along Castro Valley Boulevard and Redwood Road, the station is primarily surrounded by suburban residential development. This context increases the importance of bike access to the station since there are limited destinations within walking distance. Forty-six percent of households within a half-mile of this station earn less than $50,000 per year, slightly higher than the systemwide average (see Table 2.1). Castro Valley Station has the 45th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Station Area Access

According to BART's station profile studies, 31 percent of passengers accessed the Castro Valley station on foot and eight percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership at the station, there are growing numbers of people walking and biking in the station area. A majority of BART patrons who walk live northeast of the station, where there are no difficult roadway crossings (see Appendix B).

There are pedestrian and bicycle collision hotspots at the intersections of Castro Valley Boulevard with Wilbeam Avenue and with Redwood Road (see Appendix A). Since these statistics were collected, the County has added high-visibility crosswalks, corner bollards, pedestrian countdown signals and bulbouts to make the Castro Valley/ Willbeam intersection safer for pedestrians. BART passengers walking or biking to and from the southwest can avoid traveling along Redwood Road and under the freeway by using the existing I-580 overcrossing, west of the station. Willbeam Avenue provides a direct connection between the BART station and the Castro Village Shopping Center for passengers who work or shop there. Walk and bike access to the Castro Valley station is most challenging via the east/ Redwood Road side of the station. The intersection of the BART plaza and Norbridge Avenue currently is not welcoming to BART passengers

Location of Recommendation PB4: Redwood Rd/I-580

on foot due to the long crossing distances, large radius corners and non-high-visibility) crosswalks. Pedestrians are both inconvenienced and protected from potential conflicts with motorists leaving the parking lot headed to Redwood Road by the absence of a fourth crosswalk at this location.

Station Area Planning

The Castro Valley station currently has an Auto-Dependent station access typology designation, which is hoped to change to Intermodal/Auto-Reliant. No pedestrian or bicycle plans were written in the five years before the commencement of the BART Gap Study; however, concurrent with the study, Alameda County developed and adopted a bicycle and pedestrian plan for its unincorporated areas, including Castro Valley. Caltrans must agree to any modifications to Redwood Road where it crosses the I-580 ramps.

Recommendations

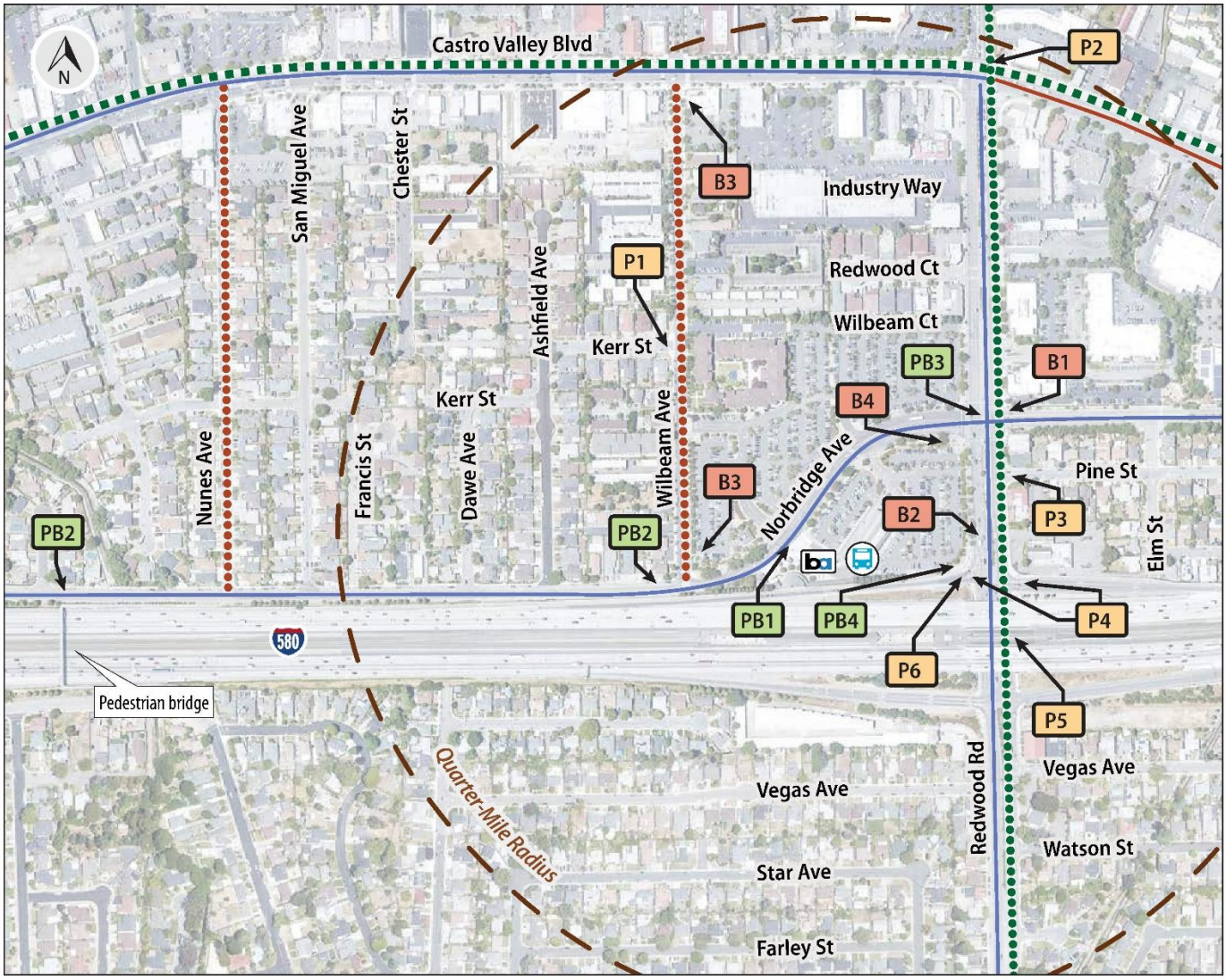
The Castro Valley station recommendations improve walking and biking in the following three areas:[7]

- **From Redwood Road:** Class IV protected bike lanes are recommended on Redwood Road. In addition, P2, P3, P4, P5, P6, B1, B2, B4, PB3 and PB4 all enhance safety for pedestrian and bicycle station access from Redwood Road. P2 evaluates adding high-visibility crosswalks, countdown signals and narrower corner curb radii at the Redwood Road/Castro Valley Boulevard intersection, a pedestrian and bicycle collision hotspot, consistent with improvements the County made to the Castro Valley Boulevard/ Willbeam Avenue intersection. P3 adds a new high-visibility crosswalk cross Pine Street, parallel to Redwood Road. P4 upgrades the crosswalks across the westbound I-580 off- and on-ramps to high-visibility striping. P5 Adds pedestrian-scale lighting under the freeway, which would need to be implemented by Caltrans. P6 evaluates the traffic signal at Redwood Road and Norbridge Avenue for pedestrian safety. B1 evaluates facilitating left turns from northbound Redwood Road into the station. B2 evaluates making lane changes just south of the station entrance. B4 adds wayfinding to the Castro Valley library. PB3 creates a more walk- and bike-friendly environment at the Redwood Road BART station entrance by adding a lead pedestrian interval (LPI), six-foot-wide pedestrian median refuge and reduced corner curb radii to the extent possible to accommodate turning buses. PB4 removes a chain link fence at Redwood Road and the I-580 westbound onramp, thereby providing a more direct walking route to the station from the south (would also likely need to be implemented by Caltrans).
- **To and at the station plaza:** PB1 improves curb ramps, extends the length of the walk phase, reduces corner radii and considers creating a fourth crosswalk leg. PB2 installs wayfinding to/from the freeway overcrossing.
- **From the north:** Class IV protected bike lanes are recommended on Castro Valley Boulevard. In addition, P1 highlights the presence of pedestrians by adding a crosswalk, stop bar and bulb-outs at Wilbeam and Kerr Avenues. B3 adds wayfinding and signage to Willbeam Avenue between the station and Castro Valley Boulevard, where Castro Valley Shopping Center is located.

Location of Recommendation PB3: Redwood Rd/Norbridge Ave

[7] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

Figure 2.3 | Castro Valley Station Map



2020

LEGEND

Existing | Planned by County		Recommended	
	Class II Bike Lane		Class IV Protected Bikeway
	Class III / Bike Boulevard	P#	Pedestrian Improvement
	Class IV Protected Bikeway	B#	Bicycle Improvement
	BART Station Entrance	PB#	Ped & Bike Improvement
	Intermodal		

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

CASTRO VALLEY STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **Wilbeam Ave/Kerr Ave** | Evaluate marking crosswalk across Kerr, modifying Kerr stop bar & adding a bulbout on east side of Wilbeam.

P2 **Castro Valley Blvd/Redwood Rd** | Evaluate implementing same pedestrian treatments as CV Blvd/Willbeam Ave (high-visibility crosswalks, countdown signals and narrower corner curb radii). Create Protected intersection when Class IV bikeway is built

P3 **Pine St/Redwood Rd** | Stripe new, high-visibility crosswalk across Pine St, parallel to Redwood Road.

P4 **Redwood Rd/westbound I-580 ramps** || Upgrade crosswalks across on- and off-ramps to be high-visibility.

P5 **Redwood Rd under I-580** | Install pedestrian-scale lighting.

P6 **Redwood Rd (SB)/WB I-580 ramps** | Evaluate longer all-red and LPI. Install Blank-out No Right Turn sign facing SB Redwood Rd that activates when peds wait to cross w. crosswalk.*

Bicycle Safety & Access

B1 **Redwood Rd/Norbridge Ave (NE corner)** | Evaluate bike box on westbound Norbridge to allow two-stage left turns from northbound Redwood Rd into BART station.

B2 **Redwood Rd (SB)/WB I-580 ramps** | Evaluate converting straight/right lane to right-turn only & reversing with bike lane. Narrow lanes to reduce vehicle speeds. *

B3 **Willbeam Ave, Norbridge Ave to Castro Valley Blvd** | Add wayfinding to Castro Village Shopping Center on Castro Valley Blvd. Install "Bikes May Use Full Lane" signs.

B4 **Norbridge Ave / Station entrance** | Add wayfinding to Castro Valley library.

Pedestrian and Bicycle Safety & Access

PB1 **Norbridge Ave/BART plaza** | Evaluate creating fourth crosswalk leg, constructing directional curb ramps, ensuring walk phase is set to 3.5 ft/sec or less, and reducing corner curb radii, while continuing to accommodate buses.

PB2 **Norbridge Ave, pedestrian overrossing to BART station** | Install wayfinding signs to/from freeway overcrossing.

PB3 **Redwood Rd/Norbridge Ave** | Evaluate LPI, 6 ft-wide median pedestrian refuge, reducing corner curb radii, while continuing to accommodate buses, and ensuring walk phase is set to 3.5 ft/sec or less.

PB4 **Redwood Rd/I-580 ramps (SB corner)** | Remove chain link fence. *

** Would require Caltrans review, approval & implementation*

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Coliseum Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	13%	39%	809	3,004	271%
Bike	2%	8%	143	597	317%

Overall entries at this station by all modes increased by 22% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Balanced Intermodal / Balanced Intermodal

Average weekday station exits: 6,354

Parking inventory (bike/auto): 79 / 954

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The Coliseum BART station is located in East Oakland. To the west, it serves the Oakland Coliseum/ Oracle Arena (via a dedicated pedestrian bridge), Amtrak station and the Oakland Airport (via the BART-operated Oakland Airport Connector rail service. Passengers can transfer directly to the Oakland Airport Connector from the station platform.) There are residential neighborhoods to the east and industrial land uses to the north and south.[8] Coliseum Station has the 21st highest ridership out of 48 stations in the BART network, based on the 2019 ridership report. A BART parking lot is located east of the station, and electronic bike lockers and bike racks are located on the Snell St. sidewalk between the lot and the entrance.

The elevated station has two entrances: the bustling west side serves customers who are dropped off or picked up by bus, private or shared vehicle, use the ADA parking and/or an elevator to reach the platform. This side of the station faces the direction of the Oakland Coliseum/Arena complex and the Amtrak station, one block away. The east entrance is accessible from the parking lot and bike parking and requires descending and climbing staircases to walk under the Union Pacific Railroad (UPRR) tracks that run adjacent to the BART alignment. Once the parking lot fills up, the area east of the station is quiet throughout most of the day. The absence of "eyes on the street" in this area likely contributes to the bike racks being largely unused.

Seventy-seven percent of households within a half-mile of the Coliseum BART station earn less than $50,000 annually, 80 percent higher than the systemwide average and the highest rate of any of the 17 Focus Stations (see Table 2.1).

Location of Recommendation PB1: BART columns alongside East Bay Greenway

Station Area Access

According to BART's station profile studies, 39 percent of passengers accessed the Coliseum station on foot and eight percent by bike in 2015, both considerably higher than in 2008 (the most recent years for which data is available; see table at left). Since a half-mile section of the East Bay Greenway opened directly south of the station, considerably more people are regularly seen walking and biking to and from the station. Coupled with increasing

[8] Although the BART tracks run at a 45-degree northwest-to-southeast angle through Oakland, directions are identified in this section as if they run due north/south, with the Bay to the west and the hills to the east.

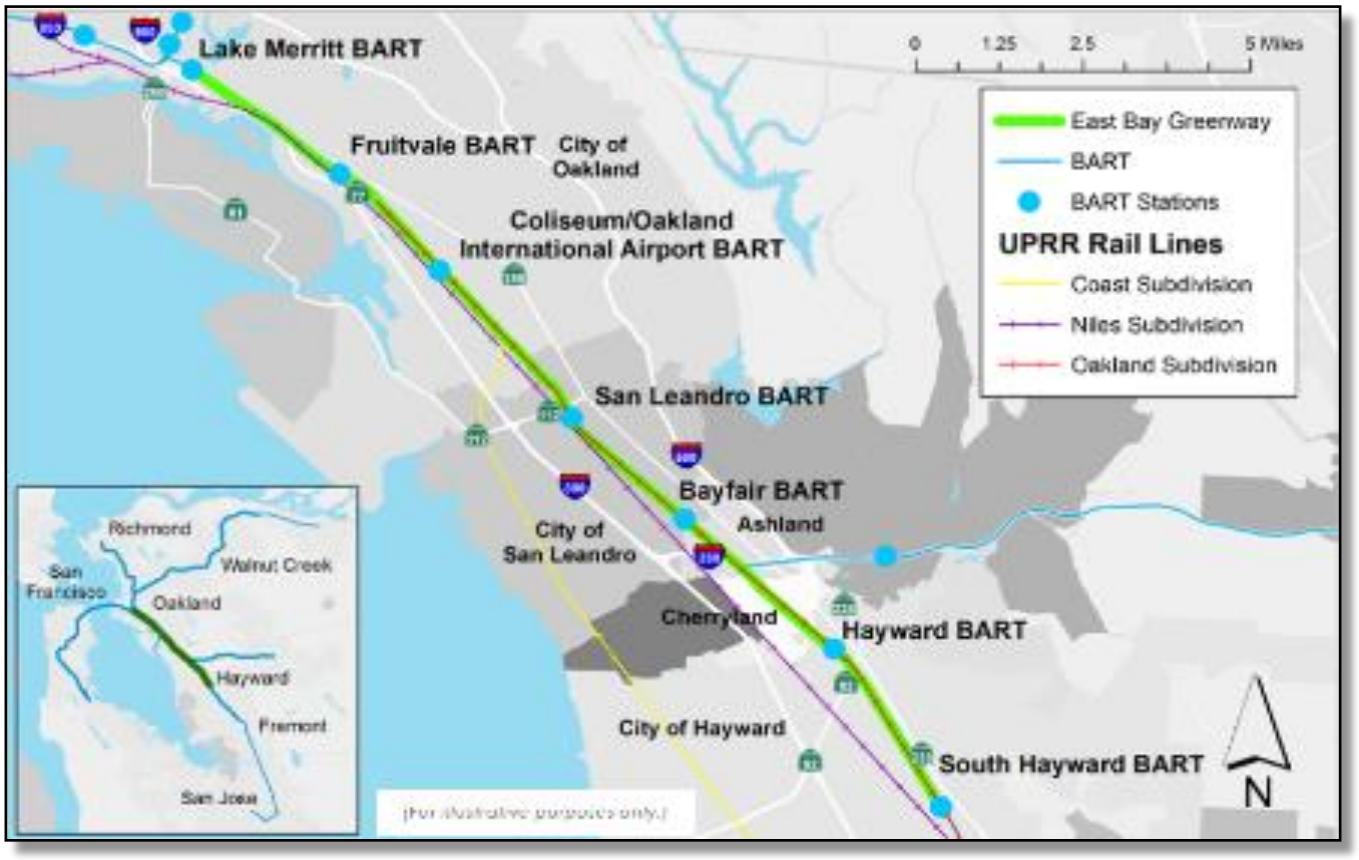
ridership from the station, there are growing numbers of people walking and biking in the station area.

Coliseum BART's current and aspirational typologies are Balanced Intermodal. The walk rate is expected to grow rapidly as transit-oriented housing replaces parking at the station. A majority of Coliseum station passengers who walk to BART today live east and northeast of the station (see Appendix B). Those who bike live farther away and are more dispersed. There have been few severe pedestrian collisions or collision hotspots in the station area – likely because few people are walking; however, there were three fatal pedestrian collisions within a quarter-mile of the station between 2013 and 2015, including two near the station entrance (see Appendix A). There are numerous pedestrian and bicycle collision hotspots along International Boulevard, a little over a half-mile to the east.

Station Area Planning

The Coliseum station currently has a Balanced Intermodal station access typology designation, which is not anticipated to change in the foreseeable future.

The Alameda County Transportation Commission (Alameda CTC) has developed conceptual plans for the East Bay Greenway (EBGW) for the purposes of environmental documentation and review. The environmental documents were approved in March 2018 for the Initial Study/Mitigated Negative Declaration under the California Environmental Quality Act and November 2018 for the Categorical Exclusion under the National Environmental Protection Act. The EBGW is envisioned to be a 16-mile multi-use facility that will connect seven BART stations from Lake Merritt to South Hayward. North and south of the Coliseum BART station, the EBGW will generally run parallel and beneath the BART



East Bay Greenway: Proposed alignment

Location of Recommendation B2: Hawley Street at Snell Street

tracks. The studied alignment connecting to the constructed segment at the Coliseum BART station area depends on Union Pacific abandoning and selling their right-of-way, also known as the Oakland Subdivision. Should Union Pacific sell the Oakland Subdivision, the EBGW in the vicinity of the Coliseum BART station, will be a Class I pathway that runs parallel to and east of the elevated BART tracks; if not, it is envisioned to be a two-way Class IV cycle-track on the east side of San Leandro Street. During the course of this study, Alameda CTC began to make headway with UPRR regarding acquiring the railroad right-of-way, causing BART to turn their attention toward working with Alameda CTC and the City of Oakland to extend the existing East Bay Greenway segment from its current northern terminus at 75th Avenue to and through the station to the north along the UPRR alignment, which runs adjacent to and east of BART's. If the right-of-way is acquired, the east station entrance can be converted to an at-grade entry, eliminating the need to negotiate stairs. This would facilitate access and improve the perception of personal safety and security on this side of the station.

The City's Bicycle Plan, updated in July 2019, includes bikeways approaching the station from all directions. The Oakland Pedestrian Master Plan was adopted in 2017 and identifies the area around the Coliseum BART station as having the lowest percentage of signals without pedestrian heads (just 33 percent) or countdown signals (none).

Concurrent with the development of this study, BART was also working on detailed plans for improving walk and bike access to both sides of the Coliseum station. This project encompasses many of that study's recommendations (see below), including extending the portion of the East Bay Greenway that has been constructed (south of 75th Avenue) to closer to the west station entrance; widening the sidewalk just north of the west station entrance; clearing the sidewalk along the west-facing side of the station; moving the crosswalk that is currently just north of the station entrance so that it lines up with the entrance; and shifting the southbound bus stops to either side of the new crosswalk location. On the east side of the station, BART plans call for adding a pedestrian entrance to the parking lot in its northeast corner; and constructing a 2-way protected bikeway connecting the east station entrance to Hawley and Brentford Streets at the BART driveway.

The City of Oakland is also planning improvements to San Leandro Street, including high-visibility crosswalks between 66th and 75th Avenues and either a 1-way or 2-way cycle-track in the event the East Bay Greenway is not constructed on the east side of the BART tracks.

Beyond the immediate station area that is the subject of BART's effort, the City of Oakland has prepared conceptual designs for a two-way multi-use pathway to join the Coliseum BART station with the Bay Trail via 66th Avenue, known as the "BART to Bay Trail Project." In 2018, this project was submitted for, but did not receive, funding from Cycle 4 of the State Active Transportation Program, but could be submitted in a future grant cycle. An Affordable Housing and Sustainable Communities (AHSC) Grant awarded to the City will build bike lanes on parts of Hegenberger Road, Edgewater Drive, and San Leandro Street by June 2021. The City has also received an AHSC grant to construct a section of the East Bay Greenway, between 69th Ave and Seminary Avenue, which will be augmented by an existing federal earmark for the BART to Bay Trail project.

BART envisions a transit-oriented development on all or part of the parking lot east of the station. That project will present an opportunity for the developer to make streetscape improvements to the 71st Avenue sidewalk between Snell and Hawley, as well as join the two portions of Brentford Street, which are now interrupted by the station parking lot.

Location of Recommendation B2: Hawley Street at Snell Street

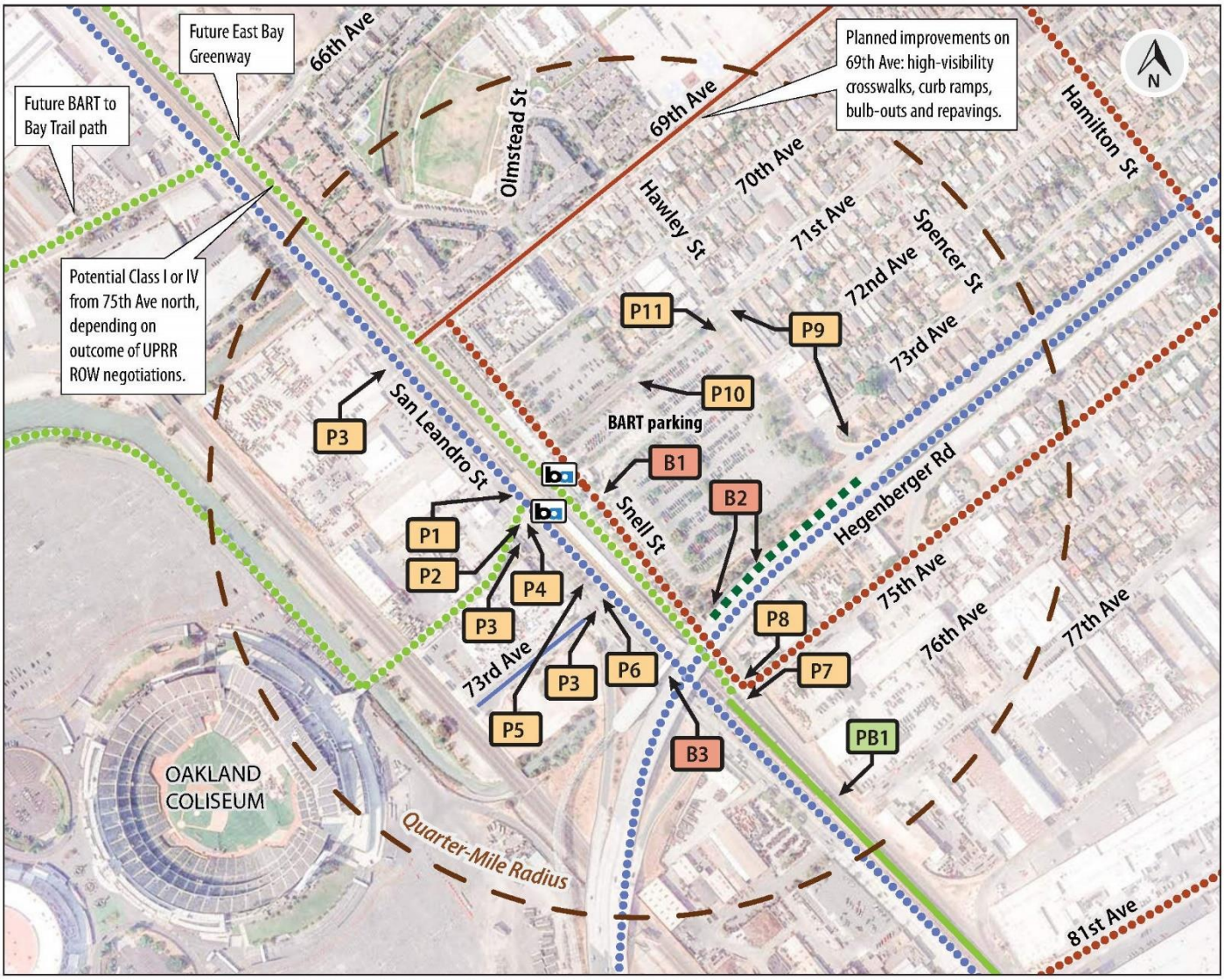
Recommendations

More people will not bicycle to the Coliseum station until it feels safer for people of all ages and abilities to bike to and from the station and to leave their bikes there while they ride BART. This work will take BART and Oakland working in partnership. Clearing the San Leandro Street sidewalk (Recommendation P4) to give bus passengers and other pedestrians more room will improve conditions; however, a plan is also needed to manage curb space, which is currently shared between AC Transit buses, transportation network companies (i.e., Lyft and Uber) and other vehicles that informally drop off and pick up BART customers. This need will become even more critical if the UPRR is not turned into a pathway and the City pursues a two-way cycle track on the east side of the road. Another challenge at the Coliseum BART station area is the need to increase trash collection, both on BART property and beyond. Recommended improvements to walk and bike access to the Coliseum BART station are concentrated east, west and south of the station:[9]

- **East of the station:** P8 and P9 ensure that future TOD on the east parking lot will enhance the pedestrian environment. P10 considers marking curb space on the west side of Snell for vehicle drop-off and pick-up to prevent them from interfering with bus service on San Leandro Street, P11 opens a new pedestrian entrance to the parking lot at its northeast corner, B1 installs a bike station across Snell from the station entrance and B2 constructs a two-way cycle-track along the north end of Hegenberger Road, between Hawley and Snell Streets.
- **West of the station:** P1 and P2 make improvements to the sidewalk and ADA parking lot driveways on San Leandro Street to improve walking conditions north of the station entrance. P5 does the same south of the station entrance. P3 replaces colored concrete with high-visibility crosswalks along San Leandro Street, between 69th and 73rd Avenues, and moves the main station crosswalk to line up with the station entrance (and move southbound bus stops accordingly). P4 improves the pedestrian environment and northbound bus stops on San Leandro Street. B3 constructs a curb ramp on the east side of San Leandro Street where the sidewalk narrows to allow bicyclists to ride northbound into a future northbound bicycle lane or, if the UPRR is not transformed into a trail, the curb ramp could lead to and from a two-way cycle-track.
- **South of the station:** P6 and P7 add facilities to the San Leandro Street/75th Avenue intersection to make walking between the current East Bay Greenway terminus and Coliseum BART safer and more inviting, while PB1 adds public art to the BART columns beneath the tracks along the Greenway.

[9] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

Figure 2.4 | Coliseum Station Map



COLISEUM STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

- P1 **San Leandro St, N/ped overcrossing** | Close south ADA parking lot driveway, stripe crosswalk across north driveway, convert to 90° stalls.
- P2 **San Leandro St, under pedestrian overcrossing** | Widen sidewalk on east side of street by continuing NW lip of curb ramp north to location of P1 closed driveway.
- P3 **San Leandro St, 69th to 73rd Aves** | Replace colored concrete in roadway with high-visibility crosswalks.
- P4 **San Leandro St, at station entrance** | Create break in median fence at, move primary crosswalk to, and construct curb ramps on both sides of San Leandro St to span both station entry points. Locate all commercial and private pick-up/drop-off on east side of street, directly south of curb ramps.
- P5 **San Leandro St, E side, south of station entrance** | Widen sidewalk into planter area, move shelters to fenceline, eliminate redundant light posts and replace awning with self-supporting model. If/when East Bay Greenway is constructed on UP Railroad ROW, move station restroom to further open up sidewalk.
- P6 **San Leandro St, S/northbound bus stops** | Redesign BART station agent parking lot driveway to single driveway.
- P7 **San Leandro St/75th St (NW & NE corners)** | Modify traffic signals to provide pedestrian countdown.
- P8 **Snell St/75th St** | Add crosswalks and curb ramps to facilitate walking to/from 75th St.
- P9 **Hawley St, 71st Ave to Hegenberger Rd** | Install sidewalks in conjunction with future TOD.
- P10 **71st Ave, Hawley St to Snell St** | Ensure that streetscape improvements implemented with TOD enhance space & sense of security with wider sidewalks and pedestrian-scale lighting placed at front or rear of sidewalk. Alternately, improvements could be made on south side of street, on BART property.
- P11 **71st Ave/Hawley St** | Open a new pedestrian entrance to the parking lot when Hawley St development opens. (BART)

Bicycle Safety & Access

- B1 **Install bike station facing Snell St near BART entrance as part of future TOD.**
- B2 **Hegenberger Rd, BART driveway to Snell St** | Install 2-way Class IV cycle track on north side of road.
- B3 **San Leandro St, northbound Hegenberger Road overcrossing to 73rd Ave** | Evaluate widening sidewalk to extend East Bay Greenway and/or construct curb ramp between path and future northbound bike lane.

Pedestrian and Bicycle Safety & Access

- PB1 **Eastbay Greenway** | Erect public art on BART columns beneath tracks.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Concord Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	19%	24%	1,097	1,600	46%
Bike	4%	5%	226	342	51%

Overall entries at this station by all modes increased by 15% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Intermodal Auto-Reliant / Balanced Intermodal
Average weekday station exits: 5,666
Parking inventory (bike/auto): 134 / 2,358

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The Concord station is on an elevated trackway, surrounded by surface and structured parking. Bicycle racks are just outside the paid area on the east side of the station and electronic lockers are on the west side, adjacent to the paid area. There are entrances from the east and west. Beyond is a variety of land uses: residential neighborhoods to the south and east; office and TOD opportunities to the west, leading to the Todos Santos Plaza, Concord's town square; and, to the north, a shopping center with residential neighborhoods beyond. Fifty-one percent of households within a half-mile of this station live in households that earn less than $50,000/year, higher than the systemwide average of 43 percent (see Table 2.1). Concord Station has the 26th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Station Area Access

According to BART's station profile studies, 24 percent of passengers accessed the Concord station on foot and five percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table to left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area, primarily from the east and west (see Appendix B). The intersection of Clayton Road and Oakland Avenue is a pedestrian collision hotspot and there was once a pedestrian fatality a few blocks south at Oakland and Atlantic Street. There has been a cluster of bike collisions northwest of the station, primarily along Pacheco Street, almost a half-mile away (see Appendix A).

Many of the roadways BART customers must walk and bike along and across are high-speed, multi-lane roads, including Galindo Street, Port Chicago Highway, Clayton Road and East Street. These roads are daunting to all but the most intrepid people on bikes and uncomfortable to cross and walk alongside on foot. Sidewalks are largely missing in the residential neighborhood east of the station. Rather than adopting citywide policies to make facilities more walk- and bike-friendly – for instance with more sensitive bike signal detectors and pedestrian pushbuttons – City staff prefer to consider each location on a case-by-case basis.

Location of Recommendation PB1: Park Street at station entrance

Station Area Planning

The Concord station currently has an Intermodal Auto-Reliant station access typology designation, which is hoped to change to Balanced Intermodal in the future.

The City of Concord has adopted three plans in the past five years that call for improvements to walking and biking in the station area: The Concord Bicycle, Pedestrian and Safe Routes to Transit Plan and the Concord Downtown Corridors Plan, both in 2016, and a Downtown Specific Plan in 2014. These plans collectively call for filling sidewalk gaps, installing high-visibility crosswalks and pedestrian-scale lighting, and adding bike facilities in the station area, as well as adopting policies consistent with other of this study's global recommendations.

A great deal of transit-oriented development is planned for the Concord BART station area, particularly to the west and north. This housing will allow many more people to live within walking and biking distance of the station and provide opportunities to fill sidewalk gaps as a permit condition. Concord's planned sanitary sewer upgrade northwest of the station will provide opportunities, once work is done and Clayton Road, Grant Street and Concord Boulevard are repaved, to add legends for planned Class III facilities.

Recommendations

Near-term recommendations to improve walking and biking conditions to and from the Concord BART station include the following:[10]

- **To/from the west:** P1, P2, P7 and P8 call for upgrading walking facilities at intersections between the station and Todos Santos Plaza, including signal, sidewalk and crosswalk improvements. P3 will eliminate a block of Clayton Road, which is redundant, thereby improving walking conditions by removing an angled intersection and creating opportunities for new crosswalks. PB1 will allow a direct walking route between the BART station and the office development across Park Street and beyond as a shortcut to Clayton Road.
- **To/from the north:** PB2 will join the existing Port Chicago Highway Class I pathway to the BART station and PB3 will create a pathway through the Concord Terminal Shopping Center.
- **To/from the east:** P4 and P5 modify two Oakland Avenue intersections where serious collisions with pedestrians have occurred.
- **To/from the south:** PB4 and PB5 will link the existing Class I pathway that is parallel to Mesa Street with the west BART station entrance. P6 will add sidewalks when the adjacent parcel develops. P7 will look at creating a crosswalk to create a direct walking route to the station from the neighborhoods to the southwest.

Location of Recommendation P4: Clayton Road and Oakland Ave.

[10] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

Figure 2.5 | Concord Station Map

2020

LEGEND

Existing | Planned by City	Recommended
Class I Bike Path	Class I Bike Path
Class II Bike Lane	Class II Bike Lane
Class III / Bike Boulevard	Class III Bike Boulevard
BART Station Entrance	Route TBD
Intermodal	P# Pedestrian Improvement
	PB# Ped & Bike Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

CONCORD STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **Colfax St / Clayton Rd / Sunset Ave** | Update traffic signal to provide pedestrian countdown time across Colfax.

P2 **East St /Sunset Ave** | Modify NW corner to extend the sidewalk to align with the planted bulb-out.

P3 **Clayton Rd/East St/Park St** | Intersection has no crosswalks. Consider abandoning Clayton Road EB from Sunset to Park to eliminate angled intersection and create opportunities for new crosswalks.

P4 **Clayton Rd/Oakland Ave** | Modify intersection with high-visibility crosswalks, LPI & advance stop bars. Also evaluate role of permitted left turns in pedestrian collisions, ability to reduce corner curb radii & increasing sensitivity of bike detector loops.

P5 **Oakland Ave/Atlantic St** | Reduce corner curb radius and add "Yield to Peds" sign on NW corner to improve pedestrian visibility & slow SB right-turning traffic.

P6 **Oak St, Gallindo St to Mt. Diablo St** | Require sidewalks when adjacent parcel is developed.

P7 **Laguna St/Oak St/Galindo St** | Evaluate safety of adding a crosswalk across the northern leg of the intersection.

P8 **Clayton Rd/Grant St** | Add thermoplastic crosswalk markings to supplement colored crosswalk markings.

Pedestrian and Bicycle Safety & Access

PB1 **Park St/BART driveway** | Consider marking a pedestrian & bicycle crossing across Park St from the SW side of driveway, including high-visibility crosswalk/cross-bike, curb extensions on both sides of Park St & flashing beacon.

PB2 **N end of W BART parking lot to Bonifacio St** | Study creating Class I pathway and/or Class IV cycle track to join existing Pt Chicago Hwy Class I pathway with BART station with easements through existing parking lots and required improvements by future development of adjacent parcels.

PB3 **Concord Terminal Shopping Center** | Create well-lit pathway to link the south end of 3rd St with the Clayton Rd/ Oakland Ave intersection, designed to increase perception of and actual safety, including directional signs north of shopping center.

PB4 **Mt Diablo St, Laguna St–Mesa** | Reduce Laguna corner curb radii if buses would still be able to negotiate turns, add Class I path on south side of street and improve crossing between two new Class I pathways.

PB5 **BART bus access road** | When bus stops are converted to layover only, remove bus shelters to allow conversion of sidewalk to Class I pathway.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Dublin/Pleasanton Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	11%	15%	851	1,224	44%
Bike	2%	5%	170	425	150%

Overall entries at this station by all modes increased by 5% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Auto-Dependent / Auto-Dependent
Average weekday station exits: 8,142
Parking inventory (bike/auto): 280 / 2,886

Sources
- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

Dublin/Pleasanton Station is the terminus of the Dublin/Pleasanton-Daly City BART line, located in the I-580 freeway median. For orientation purposes in this section, the BART station and tracks are considered to run east/west. The single station entrance is under the freeway and beneath BART's aerial structure. The entrance is accessed by a two-way bus-only roadway and a wide sidewalk that aligns with the Iron Horse Trail, a Class I shared-use path that serves the station directly. This access road connects Dublin to the north and Pleasanton to the south. Each city has its own bus intermodal stations, dedicated pick-up/ drop-off curb, and parking. Dublin has a multi-story parking garage. Dublin/ Pleasanton has the 13th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

In 2020, BART had a Measure RR-funded capital improvement project to improve pedestrian and bicycle access to the station along the Iron Horse Trail alignment, connect two segments of the trail through the BART station area and provide additional secure bike parking. The City of Dublin is simultaneously designing a pedestrian-bicycle bridge along the Iron Horse Trail that will pass over Dublin Boulevard.

The Iron Horse Trail also connects to Hacienda to the south of the Dublin/Pleasanton station. Hacienda is primarily a business center with hundreds of companies including some large company headquarters campuses. Hacienda is also home to some 4,000 residents.

Significant residential development north of Dublin Boulevard is likely to result in increased walking and biking to the station in the medium term, which may result in a change of local priorities for roadways leading to the station. Iron Horse Trail improvements planned around the station will enable more people to walk and bike to BART. It will be critical to provide safe and easy connectivity to the trail and more broadly around the station for these improvements to be effective in expanding station access options.

Only 12 percent of households within a half-mile of the station earn less than $50,000 per year, significantly fewer lower-income households than the systemwide average of 43 percent (see Table 2.1).

Station Area Access

According to BART's station profile studies, 15 percent of passengers accessed the Dublin/Pleasanton station on foot and five percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

Being a terminus station, Dublin/Pleasanton has a wider geographic distribution of rider home locations than is typical across the network. Although most travel from Dublin, Pleasanton and Livermore, many riders live in San Ramon, Danville and the San Joaquin Valley (see Appendix B). The average walking distance to the station is 1.2 miles, nearly five

times as far as what is considered a reasonable walking distance (i.e., a quarter-mile). Those who bike use dedicated bikeways such as the Iron Horse Trail and the Dublin Boulevard bike lanes.

There was a cluster of pedestrian and bicyclist-involved collisions at the intersection of Dublin Boulevard and Arnold Road, where the environment is challenging to active modes due to high-speed and -volume of car traffic, no apparent pedestrian-scale lighting at the intersection[11] and long pedestrian crossing distances (see Appendix A).

Hamlet Lane in Dublin is a private street with the most direct and pedestrian-friendly connection north of the station from the intersection of DeMarcus Boulevard and Iron Horse Parkway. Hamlet Lane connects with Campbell Green linear park and development further north, but to cross Dublin Boulevard, pedestrians must travel a few hundred feet to Sterling Street (west) or Iron Horse Parkway (east). The Iron Horse Trail provides extensive regional connectivity for bicyclists and pedestrians from as far north as Concord.

Willow Road in Hacienda Pleasanton is the most direct north-south connection to the Dublin/ Pleasanton station, which has partially buffered shoulder bike lanes and narrow sidewalks. Owens Drive is an east-west connection that intersects with the Iron Horse Trail just east of the station. Owens Drive has gone through a recent road diet, narrowing eastbound traffic to one lane and a bike lane (there was already a westbound bike lane). This bold treatment shortens the Iron Horse Trail crossing of Owens Drive and demonstrates a promising precedent for active access improvements.

Location of Recommendation P3: Existing intersection at Dublin Blvd Arnold Rd.

Station Area Planning

The Dublin/ Pleasanton station currently has an Auto-Dependent station access typology designation, which is not anticipated to change in the foreseeable future.

The station is slated to connect to the proposed Valley Link rail project. The most recent pedestrian and bike plan for the City of Dublin was adopted in 2014; an update commenced in 2019. The City of Pleasanton adopted its most recent Bicycle and Pedestrian Master Plan in 2017, which proposes a Class IV separated bikeway on Owens Drive and a Class 1 shared use path along Willow Road.

New development surrounding the station provides a great opportunity to fund projects and enhance BART ridership, but it can also leave disconnected and inconsistent improvements in the near-term. Development north of Dublin Boulevard, in particular, is likely to generate more pedestrian and bike traffic crossing that road to access the station.

Recommendations

The cities' plans already recommend improvements to the walking and biking environments in the Dublin/ Pleasanton station area. Those that would require substantial reductions in vehicle rights-of-way are not

[11] All site visits occurred during the day and no lighting studies were performed; however, no pedestrian-oriented lights were observed.

included here because they are infeasible in the near-term, nor are changes to bicycle parking because BART staff is proactively monitoring and adding all types of bike parking to meet demand.[12] The following are near-term recommendations, most of which will not require significant right-of-way acquisition:

Dublin

- **Along Iron Horse Trail:** PB1, PB4, and PB6 propose installing pedestrian and bike cut-throughs in the existing curb to connect the trail to existing development. PB2 proposes lighting to increase visibility and security along the trail.
- **In BART's northern parking lot:** B2 adds a wide ramp to the existing curb in the southwest corner of the Dublin parking lot to allow bikes easier access to the bike racks.
- **Along Hamlet Lane:** P4 proposes daylighting the crosswalk by removing a parking space on both intersection approaches, which promotes safety by increasing the likelihood a crossing pedestrian will be seen by drivers. P8 ensures that an easement will preserve public walking access on the most direct connection to the station, which is particularly important as development increases the number of pedestrians in the area.
- **From the north:** B1, B4, and B5 all improve the safety of biking in the station area by adding a physical buffer to proposed Class II bike lanes in order to separate bicyclists from motor vehicle traffic. These recommendations are shown as bike lanes in Dublin's Pedestrian and Bike Plan, and the feasibility of adding buffers will need to be studied considering City requirements. B3 also proposes installing a Class II bike lane on Scarlett Court to lead to the public easement through Dublin's Corporation Yard to connect to the Iron Horse Trail suggested in PB6. PB8 is a shared-use path planned in Dublin's Bicycle and Pedestrian Master Plan (2014) to provide a low-stress and direct connection to BART. P2 reduces the scale of the intersection of Iron Horse Parkway and Martinelli Way, shortening pedestrian crossing distances and improving sightlines by reinstituting a stop for the westbound right turn and forcing a 90-degree approach by motorists to the crosswalks. P7 adds sidewalks on Martinelli Way in advance of development as a priority to make safe pedestrian access possible.

Location of Recommendation PB3: Owens Drive at. Iron Horse Trail crossing

- **On Dublin Boulevard:** The character of Dublin Boulevard, due to its scale, speed, and volume of traffic, makes it a challenging street for pedestrians and bicyclists. In the longer term, this street is likely to see more pedestrian and bike traffic due to the substantial development north of Dublin Boulevard, which may require infrastructure changes to facilitate access for those users. As this is the only local street to cross the extent of Dublin from east to west, there are limitations to reducing vehicle capacity. In the short term, P3 and P6 both make signal changes intended to make the pedestrian experience at major intersections more welcoming.

Pleasanton

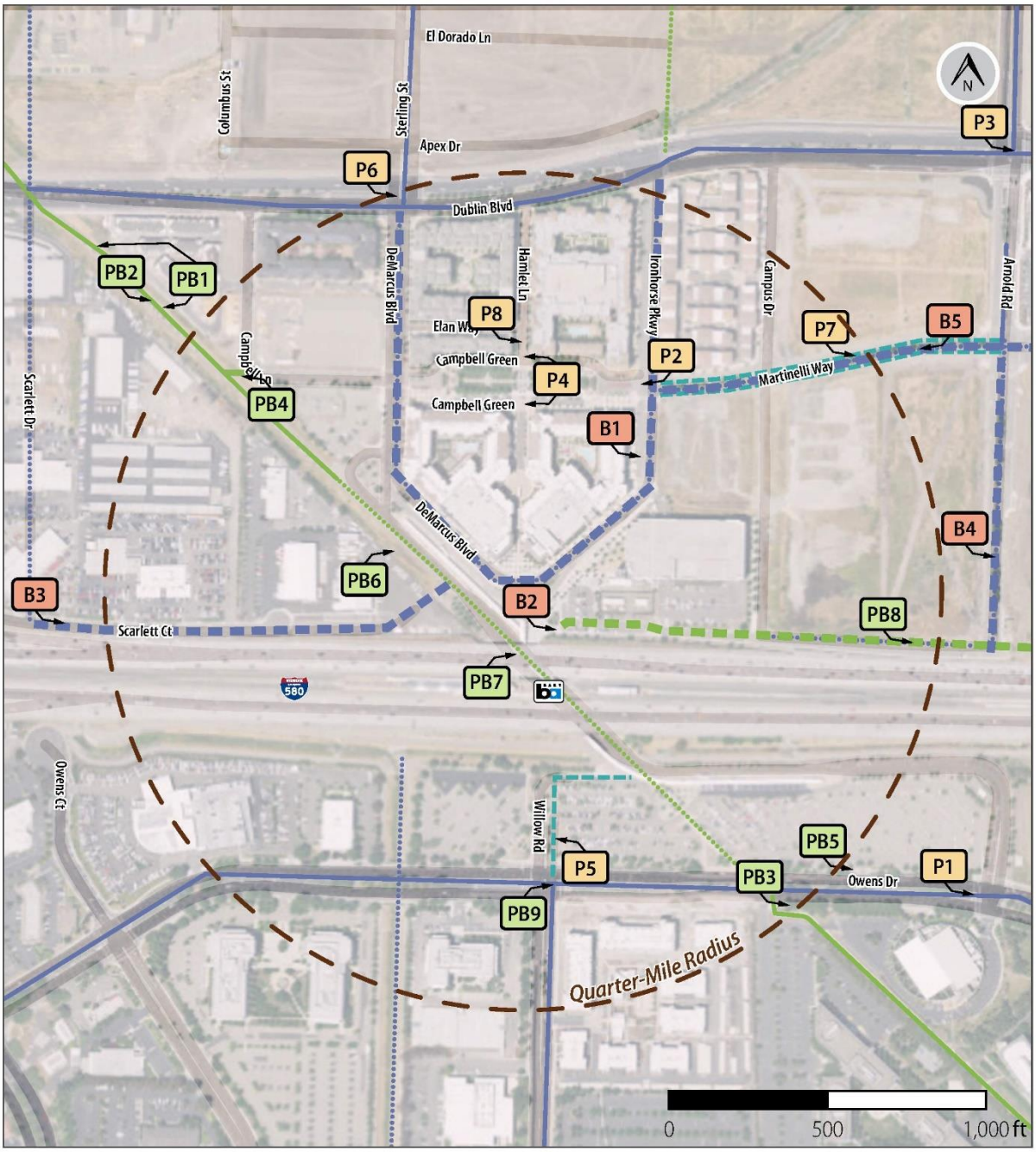
- **BART entrance:** PB7 creates a connection between the Iron Horse Trail and the station entrance, which is to be designed and implemented by BART as part of its Dublin/Pleasanton Bicycle and Pedestrian Access Improvements project.
- **In the southern parking lot:** P5 creates more direct pedestrian access to the station entrance from Willow Road by installing sidewalks, high-visibility

[12] See 2017 BART Bicycle Program Capital Plan for details.

crosswalks and pedestrian-scale lighting through the BART parking lot. PB5 reinforces the most direct path to the station entrance from the east by adding pedestrian-scale lighting.

- **On Owens Drive:** P1 improves pedestrian access by installing a median refuge at the existing crossing on the west leg of Owens Drive at BART Station in case pedestrians are unable to cross in one signal phase. PB9 reduces crossing distances at the intersection of Willow Road through tightening curb radii to straighten the crosswalks and installing directional curb ramps. It improves bike access by repurposing one westbound travel lane to upgrade existing Class II bike lanes by adding buffers. To prevent vehicle intrusion in the westbound bike lanes, the project installs curbs or vertical delineators in the buffer at the corners. PB3 moves the Kaiser Permanente driveway so right turn movements exiting the driveway will no longer conflict with pedestrians and bicyclists crossing on the Iron Horse Trail. It will make this crossing more visible and shorter with pedestrian-scale lighting, a corner bulb-out on the north side of the crossing, and a high-visibility crosswalk. Retiming the signal phasing to ensure a quick response to pedestrian actuation and enough time for pedestrians crossing in one phase will make the trail more welcoming to all users. Once the driveway is reconfigured, this project installs a raised crosswalk where the trail crosses the driveway to increase visibility and calm vehicle speeds. Detailed concepts will have to be studied in close collaboration with the owner of the site, Kaiser Permanente, to maintain access.

Figure 2.6 | **Dublin / Pleasanton Station Map**



2020

LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class I Bike or Shared-use Path
- Class II Bike Lane
- BART Station Entrance

Recommended

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Pedestrian Improvement
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

DUBLIN/PLEASANTON STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

- **P1** **Owens Dr/BART Station road (east)** | Install west leg pedestrian refuge
- **P2** **Iron Horse Pkwy/Martinelli Wy/Campbell Green** | Remove WB channelized right turn lane and reconfigure corner; Install east and west leg pedestrian refuges
- **P3** **Dublin Blvd/Arnold Rd** | Prohibit EBR or SBR vehicle movements during pedestrian phase
- **P4** **Campbell Green/Hamlet Ln** | Daylight northern and southern intersections
- **P5** **Willow Rd from Owens Dr to Iron Horse Trail** | Install sidewalk, HV crosswalks and pedestrian-scale lighting on eastern and southern side of BART parking lot
- **P6** **Dublin Blvd/DeMarcus Blvd** | Increase crossing time and reduce wait time for pedestrian signal phase
- **P7** **Martinelli Wy from Arnold Rd to Iron Horse Pkwy** | Install sidewalks
- **P8** **Hamlet Ln extent** | Establish easement for public pedestrian access

Bicycle Safety & Access

- **B1** **Iron Horse Pkwy/DeMarcus Blvd** | Install Class II buffered bike lanes
- **B2** **BART parking area near Iron Horse Trail** | Install bike ramp and access from parking lot to existing bike racks on the plaza
- **B3** **Scarlett Ct extent** | Install Class II bike lanes
- **B4** **Arnold Rd between Martinelli Wy and Iron Horse Trail** | Install Class II buffered bike lanes
- **B5** **Martinelli Wy from Hacienda Dr to Iron Horse Pkwy** | Install Class II buffered bike lanes

Pedestrian and Bicycle Safety & Access

- **PB1** **Melodia Cir** | Create two pedestrian-bike connections, one in north and one in south, to Iron Horse Trail
- **PB2** **Iron Horse Trail from Dublin Blvd to DeMarcus Blvd** | Install pedestrian-scale lighting
- **PB3** **Owens Dr/Iron Horse Trail/Kaiser Permanente driveway** | Move driveway east; Install HV crosswalk, bulb-out, and pedestrian-scale lighting; Change signal timing to prioritize pedestrian access; Install raised crosswalk where trail crosses reconfigured driveway
- **PB4** **Campbell Ln** | Create a pedestrian-bike connection to Iron Horse Trail
- **PB5** **Owens Dr from BART Station road (east) to station entrance via Iron Horse Trail** | Install pedestrian-scale lighting
- **PB6** **Dublin's Corporation Yard** | Create a pedestrian-bike connection to Iron Horse Trail
- **PB7** **BART station entrance** | Create a pedestrian-bike connection to Iron Horse Trail
- **PB8** **Hacienda Dr-I-580 frontage road from Martinelli Wy to Iron Horse Trail** | Install Class I shared-use path on west and north side
- **PB9** **Owens Dr/Willow Rd** | Tighten curb radii, install directional curb ramps, and straighten skewed crosswalks; Remove one WB travel lane to widen and install buffer on existing WB Class II bike lane

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

El Cerrito Plaza Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Change
Walk	46%	43%	2,012	2,183	8%
Bike	7%	6%	288	296	3%

Overall entries at this station by all modes increased by 14% between 2008 and 2015. Station entries by passengers who walked and biked can increase despite decreasing mode share due to increasing ridership.

Current/Aspirational BART Station Access typology: Balanced Intermodal/ Urban with Parking

Average weekday station exits: 4,802

Parking inventory (bike/auto): 206 / 750

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The El Cerrito Plaza station's namesake is a large shopping center across Fairmont Avenue from the southern edge of the BART station parking lot. The station is elevated and largely surrounded by single-family residential development, with a growing number of denser, transit-oriented housing units to the north and west. The single station entrance leads to a plaza that provides bicycle parking and is open to walking in any direction, including to the adjacent Ohlone Greenway, which travels below the BART tracks through Richmond, El Cerrito and Albany, and above the underground tracks in Berkeley. There are bike lockers along the Greenway at this station, a large auto parking lot to the west and a smaller one to the east, beyond the Greenway. The San Pablo Avenue commercial corridor is located a quarter-mile west of the station. Thirty-three percent of households within a half-mile of El Cerrito Plaza station earn less than $50,000 per year, less than the systemwide average of 43 percent (see Table 2.1). El Cerrito Plaza Station has the 30th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Station Area Access

According to BART's station profile studies, 43 percent of passengers accessed the El Cerrito Plaza station on foot and six percent by bike in 2015 (the most recent year for which data is available; see table at left). Although these figures are less than the 2008 rates, due to increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

People walk to the El Cerrito Plaza station from all directions, but primarily from the east and west where there are concentrations of neighborhoods. Bicyclists come more commonly from the north, presumably because those headed for BART from south of the station bike instead along the Ohlone Greenway to the North Berkeley station, 2.5 miles from the El Cerrito Plaza Station (see Appendix B). There is a pedestrian collision hotspot at Central Avenue and Kearney Street – the site of a fatality – and at San Pablo and Fairmount Avenues (see Appendix A). Bicycle collision hotspots within a half-mile of the station include two fatalities, one on Fairmount and Albemarle Street; the other on Central Avenue and San Mateo Street, both outside the area reviewed during the site visit to this station.

The Ohlone Greenway serves the El Cerrito Plaza BART station from the north and south; however, there are no bike lanes or paths that lead directly to the station from the east and west. Instead, the City relies on Lincoln Avenue, two blocks north of the station (and the Ohlone Greenway, which connects Lincoln to the station), and Fairmount Avenue, which has Class III bike sharrow markings. Lincoln Avenue is a quiet residential street, which the City is planning to sign as a Class III bicycle boulevard. Local bicycle advocates would prefer an east/west facility either on Central Avenue or Fairmount Avenue that will connect directly to the station, but City staff feel that

on-street parking currently precludes this. Narrow, sloped sidewalks and walkway obstructions mean Fairmount Avenue, and diagonal curb ramps at Kearney Street are also challenging for people with disabilities. The southwest Richmond Street/Central Avenue corner is a popular station gateway; however, using it to reach the station requires traversing a BART parking lot and stairway.

Existing bicycle lockers along Ohlone Greenway

Station Area Planning

The El Cerrito Plaza station currently has a Balanced Intermodal station access typology designation, which is hoped to change to Urban with Parking in the future. The walk rate will increase naturally as more people live within walking distance of the station; increasing the bike access rate will take a unified BART/City effort to welcome bicycles to the station area with safer facilities that are comfortable for a range of abilities.

The Complete Streets chapter of the 2014 San Pablo Avenue Specific Plan and the 2016 El Cerrito Active Transportation Plan call for many pedestrian improvements in the BART station area. These include enhancing current signs and roadway legend markings, and installing traffic-calming measures along Fairmount and Central Avenues, Carlson Boulevard and Richmond Street. Specific improvements to Fairmount include additional curb bulb-outs and raised crosswalks/intersections. Planned bike improvements adjacent to the station are limited to signing Fairmount as a Class III bike route with sharrows. The City's Active Transportation Plan calls for a series of roadway and trail improvements to link the BART station with the Bay Trail. The Caltrans District 4 Bicycle Plan identifies the need for Class IV separated bikeways on San Pablo Avenue north of Central Avenue and Class II bike lanes south of Central, and intersection improvements at Central and Fairmount, including a bike signal, bike lane detection and a bike box to facilitate left turns. The City's San Pablo Avenue Complete Streets Plan calls for either protected or buffered bike lanes north of Lincoln Avenue and Class II bike lanes south of Lincoln. While this plan was being developed, the Alameda County Transportation Commission was conducting a multimodal corridor study of 14 miles of San Pablo Avenue, including through El Cerrito that was also considering bicycle facilities on San Pablo.

Planned higher density housing near the El Cerrito Plaza station will bring more customers who can walk and bike to BART and will help pay for streetscape improvements to make these trips safer and more comfortable. BART is coordinating with the City of El Cerrito to issue an RFQ for transit-oriented development in summer of 2020. The City closes Fairmount, between San Pablo Avenue and Carlson for a weekly food truck event. Due to its popularity, the City is considering making this closure to motor vehicles permanent, which could create a much safer bicycling route and pedestrian crossing at Fairmount and Carlson, and would eliminate conflicts with turning vehicles from San Pablo Avenue. In the

Location of Recommendation P10: Central Avenue and Oak Street

meantime, they are planning a flashing crosswalk at this intersection. The City is also planning walking improvements on Richmond Street, along the eastern edge of the BART station.

Recommendations

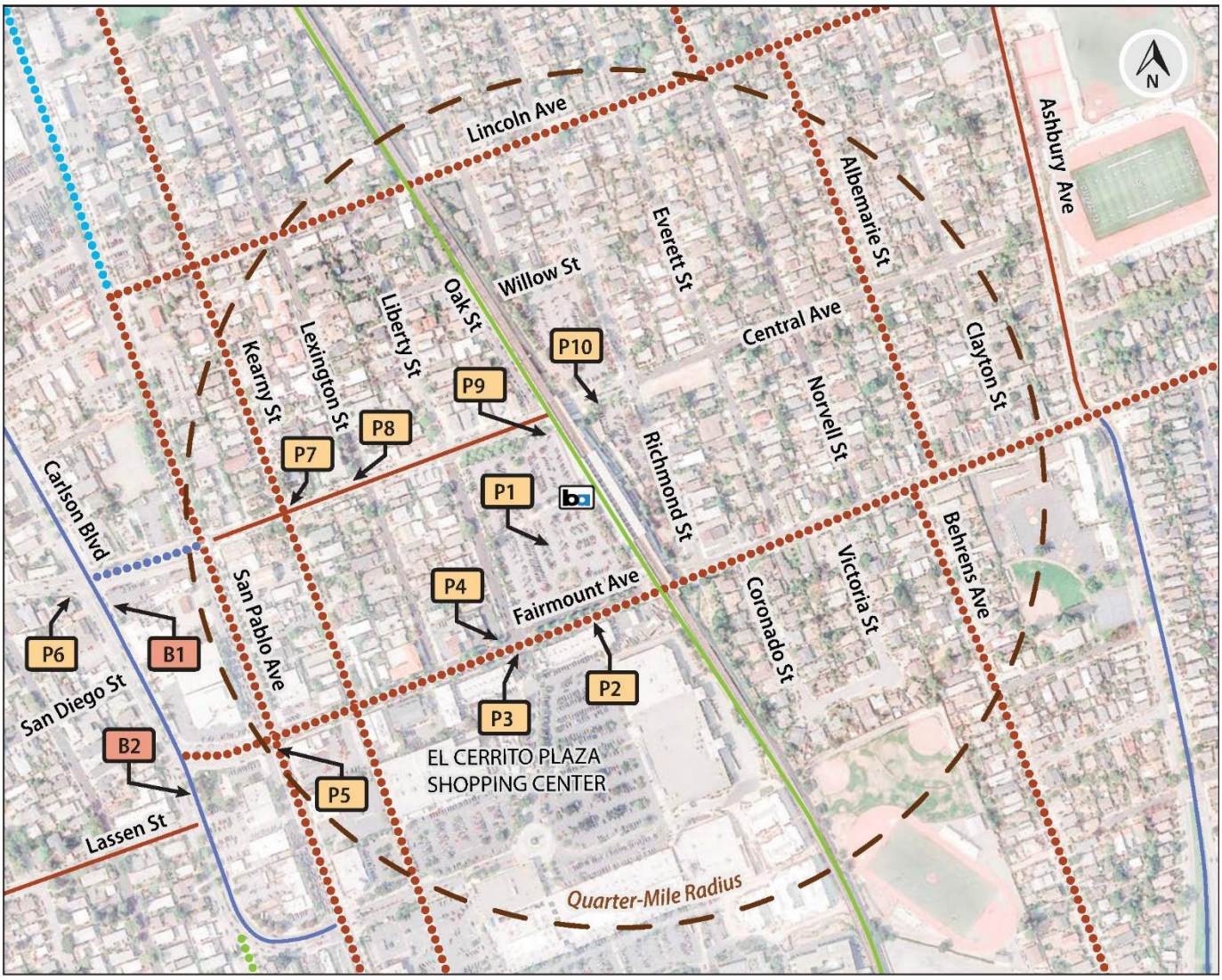
Near-term recommendations to improve walking and biking conditions to and from the El Cerrito Plaza BART station include the following:[13]

- **To/from the north:** P7, P8, P9 and P10 identify opportunities to improve walking conditions along Central Avenue. P7 and P8 look at making crossing Central safer. P9 connects the corner of Central and Oak Street – where curb ramps were recently reconstructed – with the station entrance using an accessible path in the parking lot. P10 widens the sidewalk on the south side of Central between Richmond Street and the Ohlone Greenway since the more direct route – through the station's east parking lot – is not ADA-compliant.
- **To/from the west:** P6, B1 and B2 suggest improvements to walking and biking along Carlson Boulevard. P6 makes the intersection with Central Avenue more pedestrian-friendly by installing countdown signals. B1 and B2 standardize existing bike lane striping and study adding buffers to existing bike lanes, respectively.
- **To/from the south:** P2, P3, P4 and P5 improve walking conditions on Fairmount Avenue, including cleaning up plant debris, removing sidewalk obstructions and improving the intersection with San Pablo Avenue. P1 makes walking across the western parking lot at night to reach Fairmount west of the station more secure.

[13] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

This page intentionally left blank.

Figure 2.7 | **El Cerrito Plaza Station Map**



2020

LEGEND

Existing | Planned by City

- Class I Bike Path
- Class II Bike Lane
- Class III / Bike Boulevard
- One-way Cycle Track
- BART Station Entrance

Recommended

- P# Pedestrian Improvement
- B# Bicycle Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

EL CERRITO PLAZA STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **BART parking lot** | Increase pedestrian-scale lighting. (BART)

P2 **Fairmount Ave, along BART parking lot (north side of street)** | Clean up leaf/branch debris.

P3 **Fairmount Ave/Liberty St (northeast corner)** | Move pedestrian wayfinding sign to avoid blocking sidewalk.

P4 **Fairmount Ave/Liberty St (northwest corner)** | Move trash can to landscaped area.

P5 **Fairmount Ave/San Pablo Ave** | Consider bulb-outs and lead pedestrian intervals at NW, NE & SE corners.

P6 **Carlson Blvd/Central Ave** | Upgrade pedestrian signals to countdown.

P7 **Central Ave/Kearney St** | Study supplementing crosswalk with pedestrian beacons.

P8 **Central Ave/Lexington Ave** | Add pedestrian warning signs at crosswalk.

P9 **Central Ave/Oak St (SW corner)** | Connect corner with accessible path in parking lot.

P10 **Central Ave/Richmond St to Ohlone Greenway** | Widen sidewalk on south side of street.

Bicycle Safety & Access

B1 **Carlson Blvd, San Diego St to Central Ave** | Dash NB bike lane striping for at least 50' in advance of bike lane drop, per CA MUTCD.

B2 **Carlson Blvd, El Dorado to San Pablo Ave** | Study converting existing bike lanes into buffered bike lanes or cycle track in conjunction with a road diet.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Fruitvale Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Change
Walk	23%	38%	1,743	3,386	94%
Bike	10%	11%	742	970	31%

Overall entries at this station by all modes increased by 19% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Balanced Intermodal/ Urban with Parking

Average weekday station exits: 7,897

Parking inventory (bike/auto): 277* / 873

*Including a 200-space valet bike parking station

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

Fruitvale BART is located in a vibrant transit-oriented mixed-use neighborhood in central Oakland. The entrance to this elevated station is on a public plaza lined with shops, restaurants and the offices of several community-based groups. International Boulevard, home to the area's traditional shopping district and AC Transit's Bus Rapid Transit (BRT) service that was under construction when this report was being prepared, is two short blocks to the east, with residential neighborhoods farther to the east.[14] There is a parking structure and bike station just north of the station and small surface lots to the south. On the other three sides of the station are a mixture of industrial uses and single-family homes, with the southern end of the island City of Alameda farther to the east, accessible via the Fruitvale Avenue Bridge. ASCEND elementary school is located on East 12th Street at 37th Avenue and can be reached by BART with continuous bike lanes and sidewalks. Sixty-three percent of households within a half-mile of the Fruitvale station earn less than $50,000 per year, considerably higher than the systemwide average (see Table 2.1). Fruitvale Station has the 15th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Location of Recommendation P11: San Leandro Street at 34th Avenue

Station Area Access

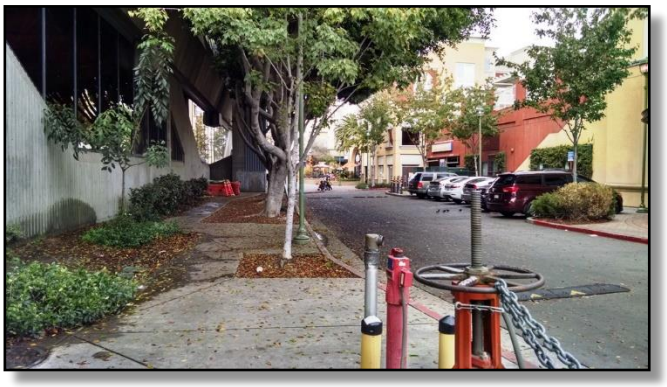
Most people who walk and bike to and from the Fruitvale BART station are coming from and going to the east and south (see Appendix B). According to BART's station profile studies, 38 percent of passengers accessed the Fruitvale station on foot and 11 percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). The bike-share station on the BART plaza, which was installed since access rates were last collected, has likely further increased the bike access rate. Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

There are numerous pedestrian and bicycle collision hotspots along International Boulevard (see Appendix A). The AC Transit BRT project is making modifications to all existing signals between 25th Avenue and High Street on International Boulevard,

[14] Although the BART tracks run at a 45-degree northwest-to-southeast angle through Oakland, directions are identified in this section as if they run due north/south, with the Bay to the west and the hills to the east.

and is installing new signals on International at 28th, Derby and 39th Avenues. The City is also improving many of these locations with dedicated bicycle lanes.

Walking across International Boulevard to reach Fruitvale BART from the neighborhoods to the east and crossing San Leandro Street from the west are two of the biggest impediments to walking to the station. Challenges to bicycling include extremely poor pavement quality in the area, including on Fruitvale Avenue leading to and from Alameda and on San Leandro Street, which is concrete. (International Blvd is being repaved as part of the BRT project.) Insufficient trash pick-up and landscape maintenance in the blocks south of the station also contribute to inhospitable walking and biking environments.



Location of Recommendation PB1: 35th Avenue and parking access road

Station Area Planning

The Fruitvale station currently has a Balanced Intermodal station access typology designation, which is hoped to change to Urban with Parking in the future.

As at the Coliseum and Hayward stations, the Alameda County Transportation Commission has developed conceptual plans for the East Bay Greenway alignment through Oakland for the purposes of the environmental documentation and review. These plans envision an asphalt walking and biking path north and south of the station that will split into two parallel routes through the Fruitvale station area: all pedestrians and passengers biking to and from the station will travel on the existing plaza to the bike station and fare gates, while people on bikes who are not headed to the BART station will be routed onto 12th Street to avoid conflicting with the often crowded BART plaza. The Greenway alignment travels through the back of ASCEND elementary school south of the station and will provide a direct, off-street route for students, faculty and staff who commute to the school by BART if Union Pacific relinquishes the right-of-way.

The City of Oakland is in the process of designing the already-funded Fruitvale Alive! Gap Closure Streetscape Project, which will improve the safety and experience for all modes of travel on Fruitvale Avenue between Alameda Avenue (which leads to the City of Alameda) and East 12th Street, including in the vicinity of the Fruitvale BART station. Project documentation specifically calls out the urgent need for bicycle and pedestrian facilities in the Fruitvale BART station area south of East 12th as a critical gap in the project area. Components of the project include improved and/or widened sidewalks, bike facility upgrades, high visibility crosswalks, bulb-outs, corner radius reductions, improved pavement, landscaping, pedestrian lighting, pedestrian signal upgrades, and wayfinding signs. A particularly important component for BART station access is a new two-stage bike box on the northeast corner of San Leandro Street and Fruitvale Avenue to help Alameda-bound passengers negotiate the left turn onto Fruitvale Avenue. The City of Oakland has also applied for funding to extend the station plaza by closing East 12th Street between 33rd and 35th Avenues.

Two affordable TOD Projects are being developed on the block bounded by 35th and 37th Avenues, and East 12th Street and the BART tracks. The first project, Casa Arabella, was completed in 2019. The second project has submitted a state grant application which could help implement bicycle improvements on East 12th Street, construct a new pedestrian and bicycle crossing from the station southbound across 35th Avenue, construct a new lighted bicycle and

Location of Recommendation P13: Fruitvale Avenue and San Leandro Street

pedestrian path between 35th and 37th Avenues, and enhance pedestrian and bicycle safety and visibility from the fare gates southbound to 35th Avenue.

AC Transit was constructing the 9.5-mile-long East Bay BRT (Bus Rapid Transit) line between San Leandro and downtown Oakland when this study was being developed. BRT provides frequent buses on dedicated lanes, which allow buses to travel faster than traditional bus service.

The City's 2017 Pedestrian Plan identifies Fruitvale Avenue from Alameda to east of International Boulevard and International Boulevard south of Fruitvale Avenue as two of the City's 34 high-injury corridors, which the plan calls the City's "most dangerous streets." Oakland adopted a new bicycle plan, Let's Bike Oakland, in 2019.

Recommendations

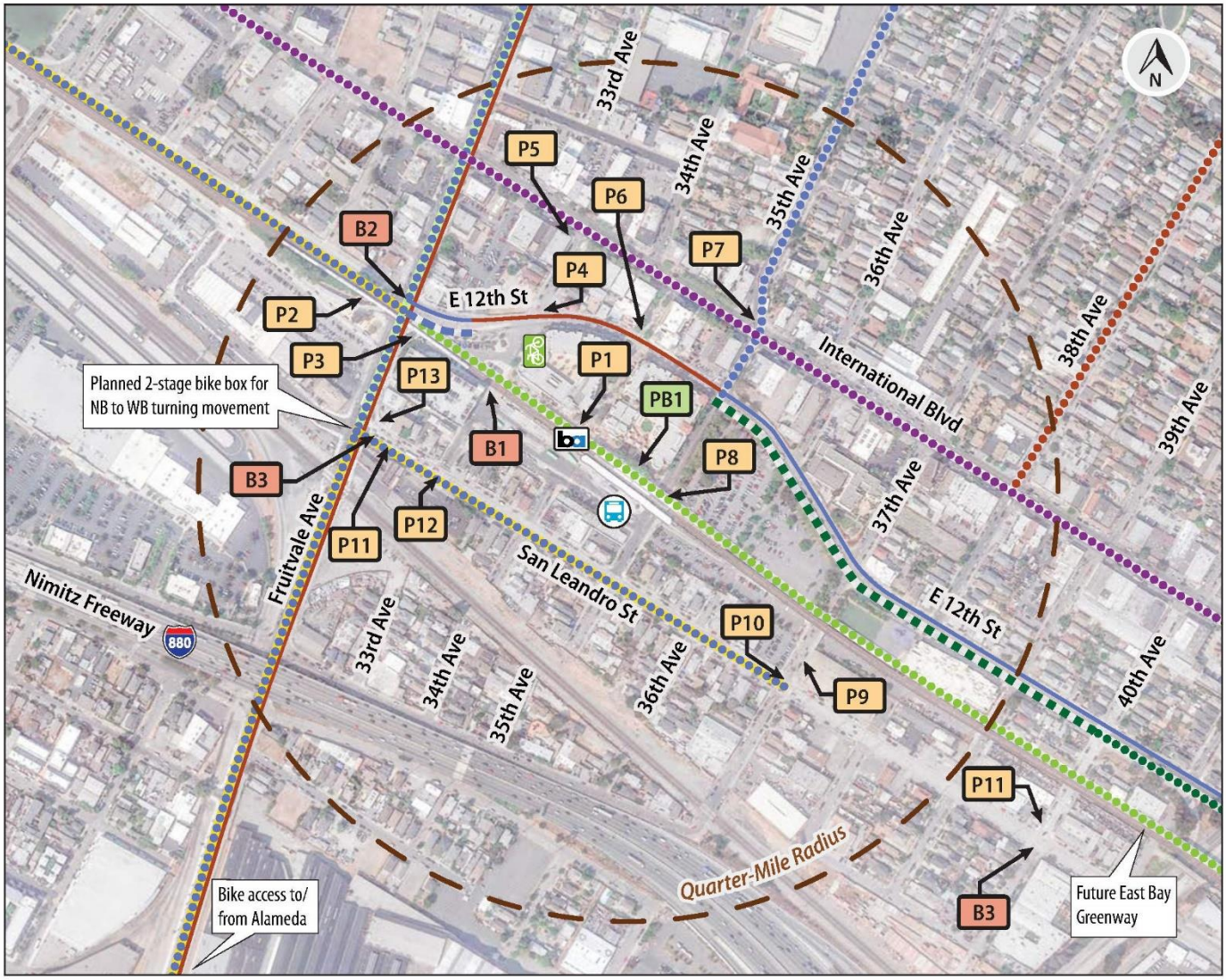
The recommended walking and biking improvements around the Fruitvale station can be grouped according to their location relative to the BART tracks and the major north/south arterials that run parallel to it: International Boulevard, East 12th Street and San Leandro Street.[15]

- **Along and leading to International Blvd**: P4, P5, P6 and P7 enhance walking conditions to and along International Boulevard via improvements to lighting, landscaping, crosswalk paint and traffic signals.
- **Along and leading to East 12th Street**: P2 abandons a redundant roadway in order to improve the Fruitvale Avenue/East 12th Street intersection for pedestrians and to expand the size of a potential TOD site. P3 improves crossing conditions for pedestrians on the east side of the same intersection, consistent with the City's Fruitvale Alive! project. P13 makes similar improvements to the southeast corner of Fruitvale Avenue/San Leandro Street, while B2 facilitates left turns at this intersection for BART passengers riding to Alameda.
- **Along and leading to the BART alignment**: P1 alerts BART to coordinate with the visually impaired community before consolidating or otherwise moving bus stops, as is being considered. P8 adds lighting under the BART tracks along 35th Avenue while P9 maintains landscaping along 37th Avenue to allow more room for people to walk. B1 facilitate access to the BART bike station by installing curb ramps from the adjacent roadway. PB1 studies the possibility of creating a shared passageway on the access road to the underground parking lot.
- **Along and leading to San Leandro Street**: P10, P11 and P12 make crossing San Leandro Street safer for pedestrians, while B3 calls for repaving San Leandro Street, which is concrete and in very poor condition.

[15] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

This page intentionally left blank.

Figure 2.8 | **Fruitvale Station Map**



2020

LEGEND

Existing | Planned by City

- Class I Bike Path
- Class II Bike Lane
- Class II Bike Lane (buffered)
- Class II Bike Lane (protected)
- Class III / Bike Boulevard
- Bus Rapid Transit

Existing

- Bike Station
- BART Station Entrance
- Intermodal

Recommended

- Class I Bike Path
- Class II Bike Lane (buffered)
- Class III / Bike Boulevard
- Class IV Separated Bikeway (2-Way)
- P# Pedestrian Improvement
- B# Bicycle Improvement
- PB# Ped & Bike Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

FRUITVALE STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **BART station bus stops** | Coordinate potential off-peak hour bus stop consolidation with vision-impaired community.

P2 **E 12th St/half-block north of Fruitvale Ave** | Abandon western leg of E 12th St to eliminate intersection with Fruitvale Ave & expand potential TOD.

P3 **FV Ave/E 12th St (SE corner)** | Redesign right turn lane "pork chop" channel to slow traffic and improve pedestrian visibility. Install yield line striping/signage, high-visibility crosswalks & pedestrian countdown signal. Consider reducing corner curb radius.

P4 **33rd Ave, Int'l Blvd to E 12th St** | Install pedestrian-level street lights.

P5 **International Blvd/33rd Ave (SB)** | Trim tree that is blocking ped xing sign.

P6 **E 12th St/34th Ave** | Repaint crosswalks & stop bars.

P7 **International Blvd/35th Ave** | Program countdown signal.

P8 **35th Avenue under BART tracks** | Add pedestrian-level lights.

P9 **37th St, San Leandro St to E 12th St** | Maintain landscaping where obstructing sidewalk.

P10 **San Leandro St/ 37th Ave** | Provide pedestrian countdown signal.

P11 **San Leandro St, Fruitvale Ave–40th Ave** | Stripe high-visibility crosswalks at all intersections.

P12 **San Leandro St/ 33rd Ave** | Provide pedestrian countdown signal.

P13 **Fruitvale Ave/San Leandro St (SE corner)** | Study closing NB right turn slip lane on San Leandro St. Would likely require eliminating "pork chop" island and moving signal equipment. Install yield line striping/signage, high-visibility crosswalks and pedestrian countdown signal. Consider reducing corner curb radius.

Bicycle Safety & Access

B1 **33rd Ave at bike station** | Install curb ramps.

B2 **Fruitvale Ave/E 12th St** | Add bike box on SB Fruitvale Ave to facilitate left turn onto E 12th St.

B3 **San Leandro St** | Repave street (concrete).

Pedestrian and Bicycle Safety & Access

PB1 **Parking lot access road, 35th Ave to station plaza** | Study creating a "shared passageway" facility, including a painted sidewalk in the short term.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Hayward Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	21%	29%	1,051	1,619	54%
Bike	2%	6%	122	326	167%

Overall entries at this station by all modes increased by 14% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Balanced Intermodal/ Urban with Parking
Average weekday station exits: 4,597
Parking inventory (bike/auto): 116 / 1,449

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The Hayward BART station is elevated, but adjacent to the at-grade Union Pacific (UP) Railroad tracks. The station has entrances to the east and west.[16] The eastern entrance leads to City Hall and downtown Hayward; the western entrance leads to a staircase that takes passengers down a flight of stairs beneath the UP tracks, and up to surface and structured parking lots. The station is largely surrounded by higher density housing to the immediate east and south, with suburban homes and industrial buildings sprinkled west of the station. Forty-eight percent of households within a half-mile of the station earn less than $50,000 annually, slightly higher than the systemwide average (see Table 2.1). Hayward Station has the 32nd highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Location of Recommendation B1: Mission Blvd, Foothill Blvd and A Street

Station Area Access

BART patrons walk to the Hayward station from all directions, particularly from the south, where there is the largest concentration of higher density housing. Bicycling passengers have more dispersed home origins (see Appendix B). Those who walk and bike from the station with destinations in Hayward are largely headed downtown, although some are going to businesses west of the station. According to BART's station profile studies, 29 percent of passengers accessed the Hayward station on foot and six percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

The very fast-moving, multi-lane traffic on The Loop is difficult to cross, creates a noisy, fast-moving environment, and is perceived as too dangerous to use by all but the bravest bicyclists. The intersection of Mission Boulevard and A Street, with its double left turn lanes, is a pedestrian and bicycle collision hotspot. Beyond these streets, other downtown locations, including A Street and D Street, are also difficult for walking and biking. There are five pedestrian collision hotspots within a quarter-mile of the Hayward BART station, and two bicycle collision hotspots within a half-mile of the station, mostly

[16] Although the BART tracks run at a 45-degree northwest-to-southeast angle through Hayward, directions are identified in this section as if they run due north/south, with the Bay to the west and the hills to the east.

along A Street (see Appendix A). Between 2013 and 2015, there was one pedestrian fatality, on D Street and Watkins Street, and one bicyclist who was killed, on Mission Boulevard and A Street. The most concentrated bicycle collision hotspots are also on A Street.

Station Area Planning

The Hayward station currently has a Balanced Intermodal BART Station Access typology, with an aspiration to become urban with parking.

As at the Coliseum, Fruitvale and South Hayward stations, Alameda County Transportation Commission has developed conceptual plans for the East Bay Greenway alignment through Hayward for the purposes of the environmental documentation. The Greenway is envisioned to be an asphalt walking and biking path located west of the Hayward station. Depending on if the UP Railroad right-of-way is obtained or not, the pathway would travel over the existing freight bridge over D Street or a new bridge would be constructed.

The City of Hayward was completing a Downtown Specific Plan and began updating its 2007 citywide bicycle plan during the development of this study. Within the BART station area, both planning processes are paying particular attention to "The Loop" – Foothill and Mission Boulevards and A Street – three four-to-five-lane one-way roads designed to carry a great deal of motor vehicle traffic quickly through Hayward, but that create very inhospitable and sometimes dangerous walking and biking conditions. The bicycle plan update will identify the appropriate class of bikeways on roadways on all sides of the BART station, taking into consideration plans for future land use and the needs of other transportation modes.

In the context of the Downtown Plan, the City is considering moving the BART intermodal facility to the west side of the station in order to open the area immediately east of the station for future development. BART staff is concerned that this move would isolate bus passengers and prevent them from helping activate any new land uses planned for east of the station.

Recommendations

A Street and the other roadways east of the Hayward BART station would particularly benefit from many of this study's global recommendations, including high-visibility crosswalks, traffic signals that provide protected pedestrian phases, complete streets training for City staff and adopting a Vision Zero policy. Specific recommendations to make walking and biking safer and more inviting mode to travel to and from the Hayward BART station address access from the following directions.[17]

- **To/from the west:** P3 and P4 increase pedestrian safety at the driveway to the BART parking entrance at Grand and D Streets with bulb-outs and access road narrowing. P5 moves a pedestrian push-button to a code-compliant location, P6 maintains landscaping that is blocking sight lines for people

Location of Recommendation P7: A Street (N side) at railroad gate

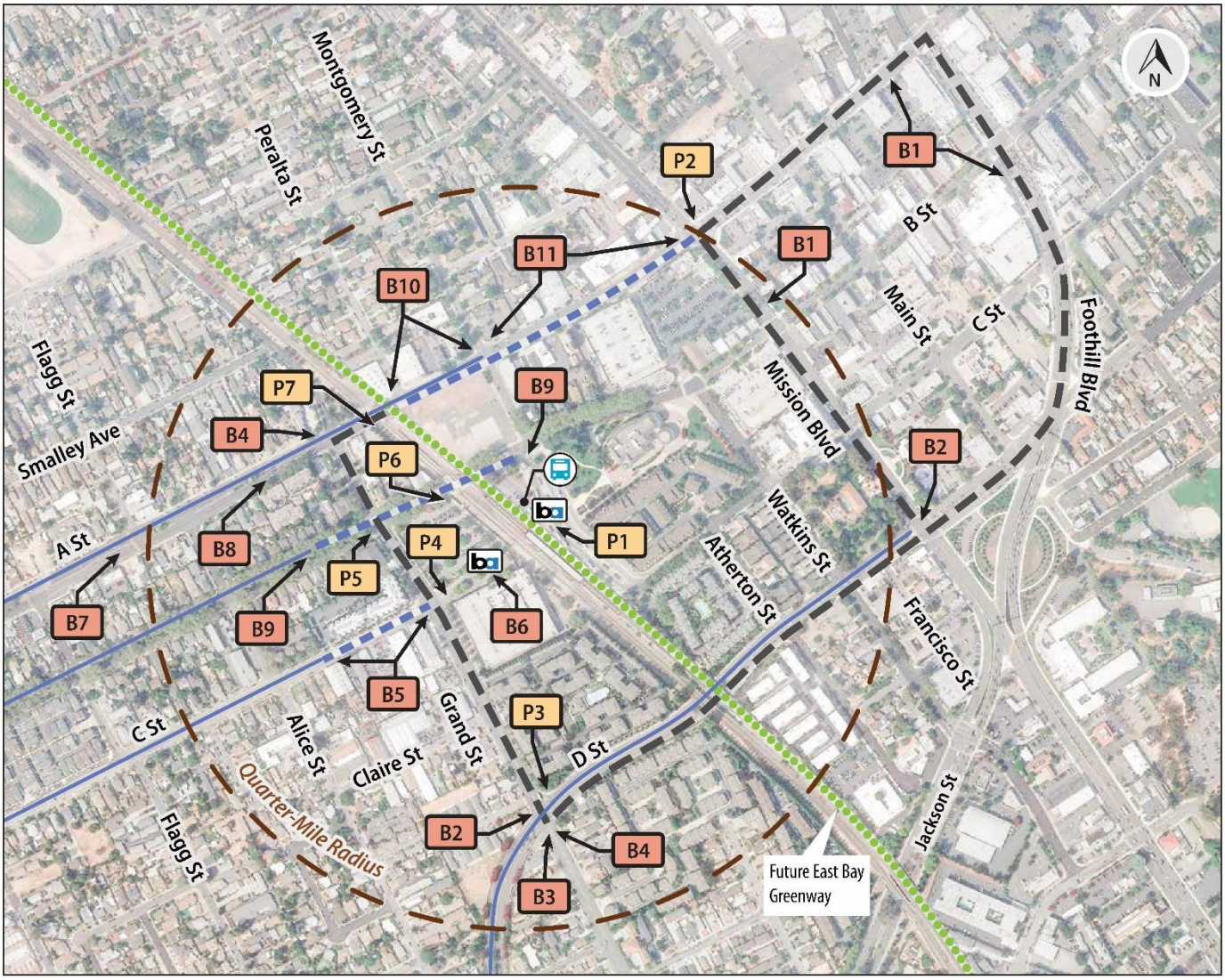
[17] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

walking at the north end of the BART surface parking lot. P7 widens the sidewalk on A Street at the railroad tracks. B3 facilitates a left turn at D and Grand Streets. B4 adds bike facilities on Grand Ave, between A and D Streets. B5 extends existing bike lanes on C Street to Grand Street. B6 improves bike access by notifying passengers with bicycles to avoid the stairway under the Union Pacific Railroad tracks by using B Street. B7, B8 and B10 improve bicycling conditions on A Street.

- **To/from the east:** P1 calls for future TOD on the east side of the station improve pedestrian crossing of the station access road. P2 modifies traffic signals at Mission Blvd and A Street to protect pedestrians crossing the street. B1 supports the City's effort to evaluate an appropriate bicycle facility for "The Loop," particularly one that is raised or otherwise separated from vehicular traffic. B2 also supports Bike Plan update efforts to study creating a separate bike facility on D Street. B9 and B11 extend existing bike lanes on B Street to the BART parking lot entrance and Mission Blvd, respectively.

This page intentionally left blank.

Figure 2.8 | **Hayward Station Map**



2020

LEGEND

Existing | Planned by City		Recommended	
Class I Bike Path		Class II Bike Lane	
Class II Bike Lane		Facility Type TBD	
BART Station Entrance		P#	Pedestrian Improvement
Intermodal		B#	Bicycle Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

HAYWARD STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

- P1 **Station entrance** | Future TOD between station/City Hall should improve pedestrian crossings at station entrance and at B St.
- P2 **Mission Blvd/A St** | Modify traffic signals to provide pedestrian countdown (NW corner) & consider blankout "No Right Turn" sign when pedestrians are present.
- P3 **Grand St / D St (NE corner)** | Consider bulb-outs or reducing the corner curb radii.
- P4 **Grand St / C St (NE corner)** | Study reducing BART access road to one lane & constructing bulb-outs on NE and SE corners.
- P5 **Grand St / B St (SE corner)** | Modify pedestrian push button placement per CA MUTCD and add corner bulb-outs.
- P6 **B St at NE edge of BART parking lot** | Trim shrubs.
- P7 **A Street (N side) at railroad gate** | Modify sidewalk pinch points at railroad crossing.

Bicycle Safety & Access

- B1 **Mission Blvd/Foothill Blvd/A St** | Study opportunities for a sidewalk-grade or raised cycle track.
- B2 **D St, Mission to Grand** | Study narrowing vehicle lanes to improve bicycle separation from vehicle traffic by adding buffer striping to existing bike lanes or providing a raised cycle track.
- B3 **D St/Grand St (SE corner)** | Consider providing 2-stage left turn box or other refuge feature.
- B4 **Grand Ave, D St-A St** | Study adding bike facility, class TBD.
- B5 **C St, from end of existing bike lanes to Grand St** | Extend existing bike lanes.
- B6 **West station entrance from parking lot** | Add to accessibility sign that customers with bikes can avoid the stairs by using B St. Add sharrows in parking lot.
- B7 **A St, both directions** | Consider narrowing travel lanes to 10' in order to widen bike lanes to 5' minimum, 6' preferred.
- B8 **A St, eastbound, Alice St to Grand St** | Prohibit parked cars and eliminate dumpster and wooden ramp in bike lane.
- B9 **B St, from end of existing bike lanes to BART parking lot entrance** | Extend existing bike lanes minimum 5'-wide with buffered door zone at taxi stand.
- B10 **A St, westbound, Montgomery Ave to Peralta St** | Widen bike lane to allow bikes to avoid cracked gutter pan, asphalt/concrete seam & stormwater drain. Prohibit parking , Western Blvd to commencement of bike lane.
- B11 **A St, from end of existing bike lanes to Mission Blvd** | Extend existing bike lanes.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Orinda Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	3%	16%	73	367	403%
Bike	2%	4%	42	84	100%

Overall entries at this station by all modes increased by 9% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Auto-Dependent / Auto-Dependent
Average weekday station exits: 2,989
Parking inventory (bike/auto): 122 / 1,361

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

Orinda station is served by the Yellow (Millbrae/ San Francisco Airport-Antioch) BART line. It is located between the eastbound and westbound lanes of State Route (SR)-24 above Camino Pablo. For purposes of this study and in keeping with Orinda's nomenclature, the BART station and freeway are considered to be oriented east-west, while Camino Pablo is north-south.

The station concourse is at ground level with one entrance, which leads directly to bus and shuttle stops and one of the station's two parking lots. East of the station entrance is a pedestrian walkway that passes over Camino Pablo and leads to the station's second parking lot and walkways to both parts of downtown Orinda: The Village to the north and the Theatre District (aka Crossroads) to the south. Ridership is relatively low at this station, 42nd of the 48 stations in the BART system, based on the 2019 ridership report; nonetheless, the parking lot fills by 7:45am on weekdays.

About a quarter of households within a half-mile of the station earn less than $50,000 per year, a significantly smaller percentage of lower-income households than the systemwide average of 43 percent (see Table 2.1).

Station Area Access

According to BART's station profile studies, 16 percent of passengers accessed the Orinda station on foot and four percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station.

While most walking passengers come from households within a quarter-mile of the station, many travel farther than a half-mile (see Appendix B). Biking passengers are evenly distributed within a half-mile radius. There was one pedestrian-involved and one bicyclist-involved crash between 2015 and 2017, both located north of the station (see Appendix A).

Downtown Orinda is divided by a raised freeway and the BART station. Camino Pablo is the only local north-south roadway connecting the two sides. Most residential areas are uphill of the BART station—in many cases steeply uphill—making walk and bike access difficult. Pedestrian access to either district from BART requires traveling on an elevated sidewalk

Location of Recommendation P2: Moraga Way at Vashell Way

Location of Recommendations B1 and PB3: Camino Pablo under SR 24

that runs on the east side of Camino Pablo. To reach the Village, the path crosses below SR-24 through a dark, loud underpass and then climbs over freeway off- and on-ramps. Camino Pablo itself has discontinuous bikeways (bike lanes and bike routes), but all but the most fearless bicyclists use the elevated sidewalk to access the station due to high roadway traffic volumes and speeds. The City has recently installed new wayfinding to help navigate between the station and downtown districts, a significant improvement over past conditions.

Northwest of the station in the Village town center, a road diet on Orinda Way successfully improved the pedestrian environment near the community center; however, there are no bikeways on Orinda Way.

South of the station in the Theater town center, Moraga Way is similarly pleasant for pedestrians. The elevated sidewalk from the station has been recently rebuilt to provide ADA access and pedestrian-scale lighting. The ramp ends at the end of the Bryant Way cul-de-sac, behind the Theater Square complex, making it unclear on arrival where the town center is located. Camino Pablo's width and awkward intersection geometry, limited and indirect crossings, and fast-moving traffic from the highway off-ramp are barriers for residents living west of the BART station. Opportunities for improvements are longer term than the horizon of this study. St Stephens Trail ends just east of the Theater District, providing regional walk and bike connectivity towards Lafayette.

There are no bikeways, specifically low-stress bikeways, on Moraga Way or Orinda Way. Although green bike lanes have been added to portions of Camino Pablo, the major north-south throughway for vehicles in the region, using them requires crossing a lane of traffic headed for the Highway 24 onramp. Therefore, there is limited utility to concentrating on the roadway as a bike route for anyone but the most experienced and confident riders.

Station Area Planning

The Orinda station currently has an Auto-Dependent station access typology designation, which is not anticipated to change in the foreseeable future.

The City commissioned and adopted a plan – "ConnectOrinda" – in late 2019 to identify ways to make the Village and Theater districts, and the BART station, more accessible without a car. One of the primary project goals was to find ways to make travel between the Orinda BART station and the two sides of downtown Orinda safer and easier by all modes. Working with the community, the effort identified streetscape and transportation projects that beautify, improve travel through, and preserve the uniqueness of downtown Orinda.

Orinda's Bicycle, Trails, and Walkways Master Plan was last updated in 2011 and is likely to be updated by 2021. Some of the key recommendations in the station area have since been implemented, including improvements to the stairway and ramp leading to the Theatre District and the Camino Pablo bike lanes.

Recommendations

Many of the recommendations for Orinda focus on the elevated sidewalks that connect the Village and Theater town centers with the BART station, the only route available for pedestrians to access the station. Bicyclists can use Camino Pablo to enter and exit the station via the parking lots, but high traffic volumes and speeds discourage all but the most confident cyclists from doing so. As a result, most passengers who reach the Orinda station by bike also use the narrow, elevated sidewalks.

In the long term, a rehabilitation or rebuild of the elevated sidewalk/bridge and consideration of a redesign to some of the freeway on- and off-ramps to allow conflict-free, at-grade access for pedestrians and bikes should be considered in coordination with Caltrans. To advance other types of longer-term context-sensitive walkways and bikeways, discussions with residents and pilot projects that show how some of these concepts could work are needed.

Projects that would make walk and bike access between both sides of downtown and the BART station safer and easier to use in the next five years include the following:[18]

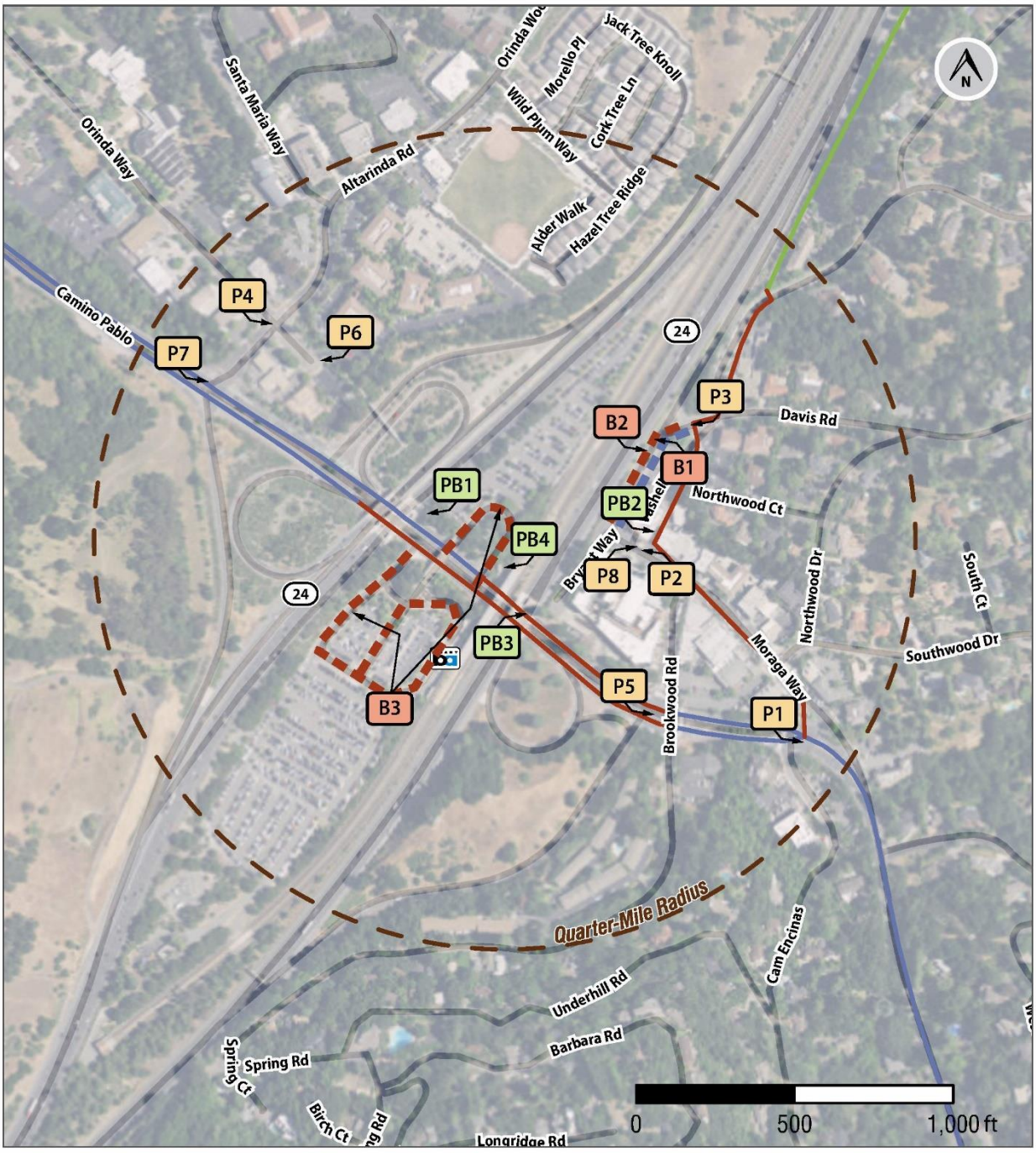
- **The Village:** P4 uses corner bulb-outs and tightened curb radii to reduce pedestrian crossing distances, reduce vehicle speeds, and increase visibility between pedestrians and cars at the northern touchdown of the elevated sidewalk. P7 is a longer-term project to provide pedestrian access at the Camino Pablo/ Santa Maria Way intersection to improve walk access to the de Laveaga Trail.
- **The Theater District:** B1 and B2 improve the safety of the connection to St. Stephens Trail by increasing the visibility of bicyclists: B1 slows cars down so they can see bikes and pedestrians crossing Bryant Way at Davis Road, while B2 formalizes this connection for cyclists. P3 shortens pedestrian crossing distances at the Davis Road/ Bates Boulevard intersection. P1 and P5 reduce crossing distances for pedestrians, improve sightlines, and slow turning traffic on Camino Pablo by adding corner bulb-outs, tightening curb radii, and straightening crosswalks. PB2 converts Vashell Way to a shared passageway to slow traffic and make pedestrians and bicyclists more prominent on this narrow alley. P2 includes near-term and medium-term recommendations to slow vehicle speeds and increase visibility at the Moraga Way/Vashell Way crosswalk. P8 adds a crosswalk through the traffic circle on Bryant Way.
- **Around BART property:** P6, PB1 and PB3 improve the elevated sidewalk that connects the two town centers and the BART station. These include both smaller-scale incremental improvements such as adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

Location of Recommendation P6: South end of Orinda Way

[18] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and

adding more pedestrian-scale lighting, acoustic treatments and wayfinding, to creating a bigger landing at the northwest end of the elevated sidewalk. In the long term, as this is the only pedestrian (and low-stress bike) connection to the station, it would benefit from a thoughtful rebuild to upgrade to a Class I shared-use path. The scale of such a project is beyond the scope of this study. B3 adds a route through the BART parking lots for bikes to and from Camino Pablo, the only formal bike access to the station. The BART parking lot and much of the elevated sidewalk is in Caltrans' right-of-way, so any alterations would require their permission and cooperation. PB4 recommends reopening the eastern entrance to the station, which would substantially reduce the distance for bikes and pedestrians to reach the fare gates. Given current BART guidance on requirements for station entrances (such as a station agent booth), this may be challenging in the short term but should be considered as BART access requirements and technologies evolve.

Figure 2.10 | **Orinda Station Map**



LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Class III Bike Route
- BART Station Entrance

Recommended

- Class II Bike Lane
- Class III Bike Route
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

ORINDA STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

- P1 **Moraga Wy/Camino Pablo/Cam Encinas** | Install HV crosswalks and pedestrian signal heads to the missing legs; Install corner bulb-out or tighten curb radii at all possible corners.
- P2 **Moraga Wy/Vashell Wy** | Short term, daylight crossing and add white transverse lines to existing crosswalk; medium-term, replace existing crosswalk with a HV raised crosswalk.
- P3 **Davis Rd/Bates Blvd** | Add HV crosswalks with corner bulb-outs to the north and east legs.
- P4 **Santa Maria Wy/Orinda Wy** | Tighten curb radii or add corner bulb-outs where street parking allowed.
- P5 **Camino Pablo/Brookwood Rd** | Tighten curb radii or add corner bulb-out to the SE corner; straighten crosswalk.
- P6 **Orinda Wy/Elevated sidewalk** | Enlarge landing; install HV crosswalk across driveway and corner bulb-out opposite the landing.
- P7 **Camino Pablo/Santa Maria Wy** | Fill in sidewalk gap on Santa Maria; Install HV crosswalks and pedestrian signal heads to north and east legs; Modify channelized right turn lanes to minimize crossing distances and reduce vehicle speeds.
- P8 **Moraga Wy/Bryant Wy** | Install a crossing on the south leg through traffic circle; Daylight the intersection or extend corner bulb-out; Add white transverse lines to existing east crosswalk.

Bicycle Safety & Access

- B1 **Bryant Way/Davis Rd** | Install geometric design modifications to reduce vehicle speeds, such as painted corner bulb-outs or center-lane striping with delineators.
- B2 **Bryant Wy from Moraga Wy to Vashell Wy** | Install Class III bike route with HV sharrows westbound and Class II bike lane eastbound.
- B3 **BART parking lots from Camino Pablo to station entrance** | Install Class III bike route with HV sharrows.

Pedestrian and Bicycle Safety & Access

- PB1 **Elevated sidewalk between Orinda Wy, Bryant Wy, and BART** | Improve pedestrian-scale lighting; Install weather protection and wayfinding signage.
- PB2 **Vashell Wy from Moraga Wy to Davis St** | Install shared passageway.
- PB3 **Camino Pablo CA-24 underpass** | Install sidewalk markings to accommodate both pedestrian and bicyclist access; Study and install acoustic treatments to minimize road noise.
- PB4 **East side of BART station** | Reopen secondary station entrance.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Richmond Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	31%	37%	1,127	1,762	56%
Bike	4%	6%	143	274	92%

Overall entries at this station by all modes increased by 29% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Balanced Intermodal/ Urban with Parking

Average weekday station exits: 4,135

Parking inventory (bike/auto): 84 / 750

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The Richmond station is an elevated terminal station, and is co-located with an Amtrak and Capital Corridor station. There are BART entrances from the west and east. The station is bordered to the south by Macdonald Avenue, a commercial street (including the home of Rich City Bikes, a bike shop and bike advocacy hub on the corner of 16th Street), and a residential neighborhood. Immediately east of the station are two future TOD sites, a largely residential neighborhood and, within a half-mile, the Richmond Art Center and City Hall. Immediately to the west of the Richmond BART station is transit-oriented housing and large Social Security Administration, postal service and Kaiser medical facilities. North of the station is largely residential. The station Sixty-three percent of households within a half-mile of the station earn less than $50,000 per year, almost 50 percent higher than the systemwide average (see Table 2.1). Richmond Station has the 35th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Station Area Access

Bike racks are located just inside and outside the fare gates and bike lockers on both sides of the station. There is a surface parking lot and parking structure west of the station. The surface lots east of the station are in various stages of being permitted for future TOD. BART passengers walk and bike to the Richmond station from homes in all directions (see Appendix B). According to BART's station profile studies, 37 percent of passengers accessed the station on foot and six percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

Although there are no concentrations of pedestrian collisions within a quarter-mile of the station, there were pedestrian fatalities at Macdonald Avenue and 16th Street, at the station entrance, and at 23rd St and Nevin Avenue between 2013 and 2015. There have been concentrations of collisions involving bikes in a number of locations within a half-mile of the station, including one fatality at 15th Street and Bissell Avenue. High-speed traffic on Barrett Avenue, Marina Way and Macdonald Avenue prevent walking and biking to the Richmond BART station from feeling and being safer. Beyond the need to calm this traffic, more resources dedicated to crime prevention and roadway maintenance at and around the station are also needed.

Location of Recommendation B8: 15th Street and Nevin Avenue

Location of Recommendation PB2: Portola Avenue and Barrett Avenue

Station Area Planning

The Richmond station currently has a Balanced Intermodal station access typology designation, which is hoped to change to Urban with Parking in the future.

The City of Richmond's Wellness Trail is a planned bicycle and pedestrian route that touches the BART station from the south on 16th Street and west from Nevin Avenue. Its aim is to inspire users to make health- and wellness-oriented lifestyle choices. The 2016 Wellness Trail Plan includes many near-term and longer-term traffic calming projects and bike facilities improvements, including near BART. In 2019, the City completed a study of ways to improve first mile/last mile access to local destinations, including the BART station, with funding from a Caltrans Sustainable Transportation Planning Grant. Rich City Bikes is interested in partnering with BART to open an attended bike station in the City's R-Transit building, located on the western BART plaza. BART's practice is to serve demand for secure parking with bike lockers, to the extent possible, because they are less expensive to operate than a staffed bike station, but BART staff is looking into this request.

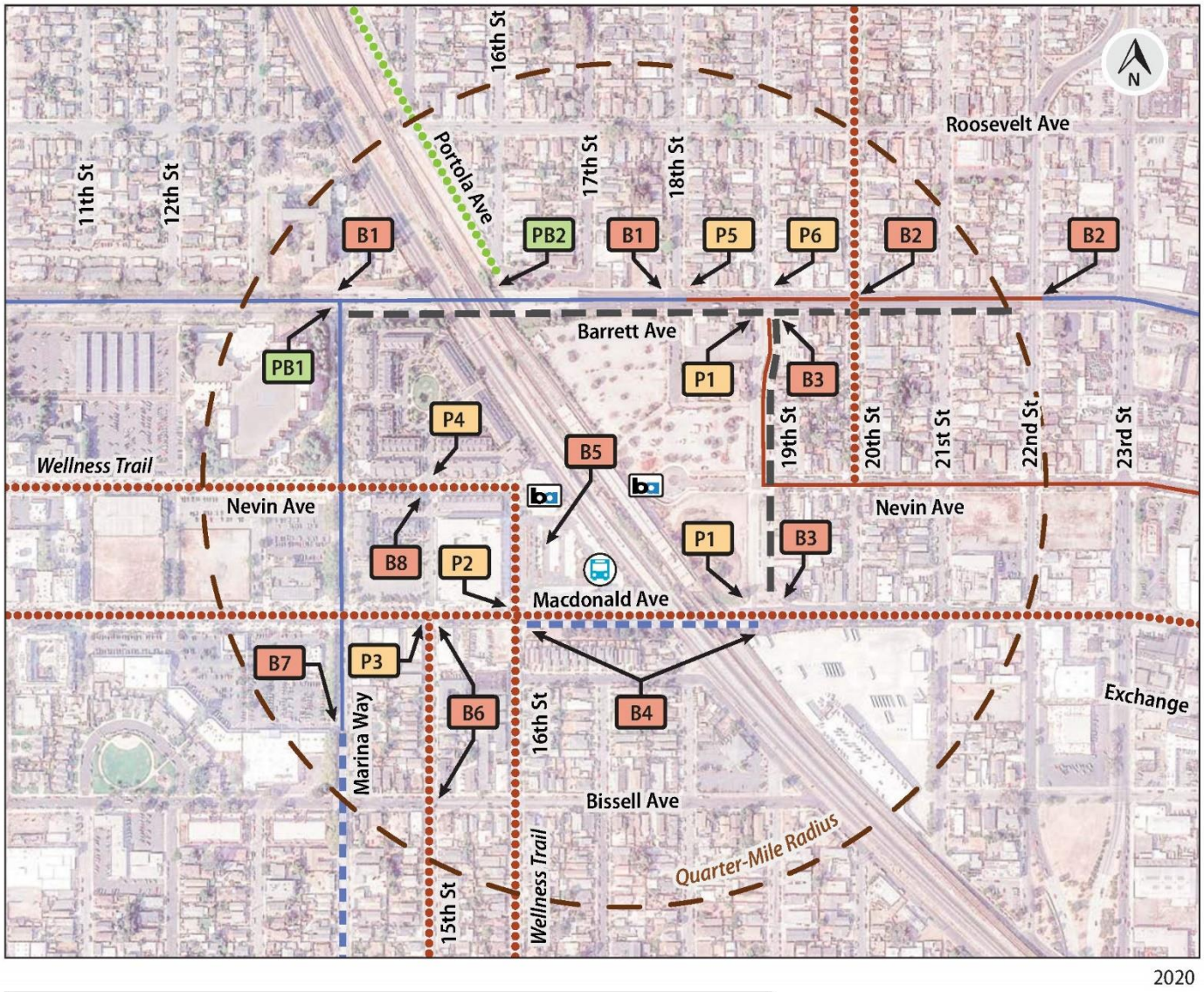
Recommendations

Beyond the global recommendations, improvements to the Richmond BART station area address access from all four directions, as follows:[19]

- **To/from the west:** P4 and B5 improve biking and walking facilities on Nevin Avenue, west of the station. B1 and PB1 make the Barrett Avenue/Marina Way intersection, a bicycle collision hotspot, safer for passengers coming from the west on bikes.
- **To/from the north:** BART patrons accessing the station from the north must cross Barrett Avenue, a four-lane divided roadway with very fast auto traffic. P5 and P6 create safer crossings of Barrett, while B2 looks at filling a bike lane gap on Barrett. PB2 replaces an informal, unpaved path that joins Portola Avenue to Barrett with a proper walk and bike connection.
- **To/from the east:** P1 and B3 make improvements to walking and biking along 19th Street, between Barrett and Macdonald Avenues.
- **To/from the south:** P2 and P3 make walking safer on the station's southern access road, while B4 will provide bike lanes along the southern station border.

[19] Recommendations do not include changes to BART parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

Figure 2.11 | **Richmond Station Map**



2020

LEGEND

Existing | Planned by City		Recommended	
	Class I Bike Path		Class II Bike Lane
	Class II Bike Lane		Facility Type TBD
	Class III / Bike Boulevard	P#	Pedestrian Improvement
	BART Station Entrance	B#	Bicycle Improvement
	Intermodal	PB#	Ped & Bike Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

RICHMOND STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

- P1 **19th St, Barrett Ave to Macdonald Ave** | Incorporate sidewalk and streetscape elements in future TOD. Consider pedestrian scale lighting, street furnishings and a minimum 8-foot sidewalk.
- P2 **Macdonald Ave/16th St** | Consider scramble phase or otherwise don't allow permitted left turns to conflict with pedestrians in the crosswalk. Create LPI, at a minimum. Consider parklet on southwest corner.
- P3 **Macdonald Ave/15th St** | Install pedestrian warning signs and high-visibility crosswalks.
- P4 **Nevin Ave/15th St** | Consider median refuge or traffic circle to accommodate direct pedestrian path of travel.
- P5 **Barrett Ave/18th St** | Stripe all four crosswalk legs.
- P6 **Barrett Ave/ 19th St** | Stripe fourth crosswalk leg and upgrade traffic signal to include pedestrian countdown.

Bicycle Safety & Access

- B1 **Barrett Ave, 18th St to Marina Way** | Study ways to improve bicycle safety, including constructing one-way Cl 4 raised cycle tracks on both sides of Barrett Avenue or raised buffers where striped buffers currently exist.
- B2 **Barrett Ave, 19th to 22nd Sts** | Study road diet in order to close bike lane gaps.
- B3 **19th St, Barrett Ave to Macdonald Ave** | Consider a road diet. Stripe edgeline to calm traffic.
- B4 **Macdonald Ave, 16th to 19th Sts** | Consider road diet to provide bike lanes.
- B5 **West BART Plaza** | Consider operating bike station out of the existing "R-Transit Center" building.
- B6 **Northbound 15th Street, Bissell Ave to Macdonald Ave** | Repair concrete gutter so cars can park closer to curb.
- B7 **Marina Way, south of Macdonald** | Replace sharrows with bike lane to conform with bike lanes north of Macdonald.
- B8 **15th St/Nevin Ave** | Provide a ramp to allow bicycle access to/from plaza.

Pedestrian and Bicycle Safety & Access

- PB1 **Marina Way/Barrett Ave** | Improve intersection to slow motor vehicles on Barrett Ave & improve pedestrian crossings.
- PB2 **Portola Ave to Barrett Ave** | Replace informal, unpaved path with proper walk & bike connection.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

San Bruno Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	24%	40%	582	1,578	171%
Bike	3%	6%	73	223	205%

Overall entries at this station by all modes increased by 61% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Intermodal/Auto-Reliant/ Balanced Intermodal
Average weekday station exits: 3,669
Parking inventory (bike/auto): 43 / 1,058

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

The San Bruno BART station adjacent to The Shops at Tanforan shopping mall, with big box retailers to the north, single family residential neighborhoods directly to the east and south, and multi-family residential and employment located west of the mall, across El Camino Real. There is a local police department adjacent to the station, which is underground and has entrances that lead directly to Tanforan mall and to Huntington Avenue. The station is less than a mile from the San Bruno Caltrain station. Thirty-three percent of households within a half-mile earn less than $50,000 annually, less than the systemwide average (see Table 2.1). San Bruno Station has the 38th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report.

Station Area Access

There is a large parking structure north of the San Bruno station, which is accessible from Sneath Lane. Bike parking is located on the plaza northwest of the station and inside the fare gates. According to BART's station profile studies, 40 percent of passengers accessed the San Bruno station on foot and six percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

Most passengers who walk and bike to San Bruno BART live east of the station, along El Camino Real (see Appendix B). There are collision hotspots for people walking where Sneath Lane intersects with Sea Biscuit and Huntington Avenues, both signalized intersections, but there were no fatal pedestrian collisions between 2013 and 2015 (see Appendix A). There are bicycle collision hotspots about a half-mile from all sides of the station, with a concentration a quarter-mile away on Dollar and Tanforan Avenues (none of these locations were viewed during the site visit). There were fatal collisions involving bicyclists between 2013 and 2015; one at Dollar Avenue just north of Tanforan Avenue; the other on South Spruce Avenue near Huntington Avenue.

The major barriers to walking and biking to and from the San Bruno BART station are:

- **From the east:** There is a gap between the Centennial Way Trail, which serves South San Francisco, and the BART station. A large grade difference between the northbound and

Location of Recommendation PB1: Huntington Avenue at station entrance

southbound sides of Huntington Avenue prevent people biking from the south and walking from the east from crossing directly to the station entrance. There are no signs indicating how close together the BART and Caltrain stations are to each other.

- **From the west:** It is difficult to know the station is there, particularly from Tanforan. People crossing El Camino Real and Sneath Avenue on foot or by bike can feel vulnerable to collisions with fast-moving traffic. Caltrans must agree to any modifications to El Camino Real, which is State Route 82.

Location of Recommendation P8: Huntington Avenue under I-380

Station Area Planning

The San Bruno station currently has an Intermodal/Auto-Reliant station access typology designation, which is hoped to change to Balanced Intermodal in the future.

The City adopted the San Bruno Walk 'n' Bike Plan in 2016, which identifies the need for a new Class I connection between the Centennial Way Trail and the BART station entrance and intermodal facility on Huntington Avenue. This capital project has been funded with a OneBayArea grant but has not yet been constructed. Other projects called for in the plan that support improved access to the BART station include pedestrian crossing improvements at El Camino Real at Sneath Lane and Commodore Drive, all four I-380 ramps, and the Sneath/ Huntington intersection; streetscape improvements on Huntington Avenue and El Camino Real; and Class IV separated bikeways on Huntington Avenue. The Caltrans District 4 Bicycle Plan, adopted in 2018, supports the City's planned projects on SR-82 (El Camino Real). The Shops at Tanforan is planning a future expansion, which may provide an opportunity for more direct and clear access to the BART station from the west by creating prominent, well-signed walk and bike routes through the parking lots.

Recommendations

San Bruno station area recommendations are clustered in three general locations, as follows:[20]

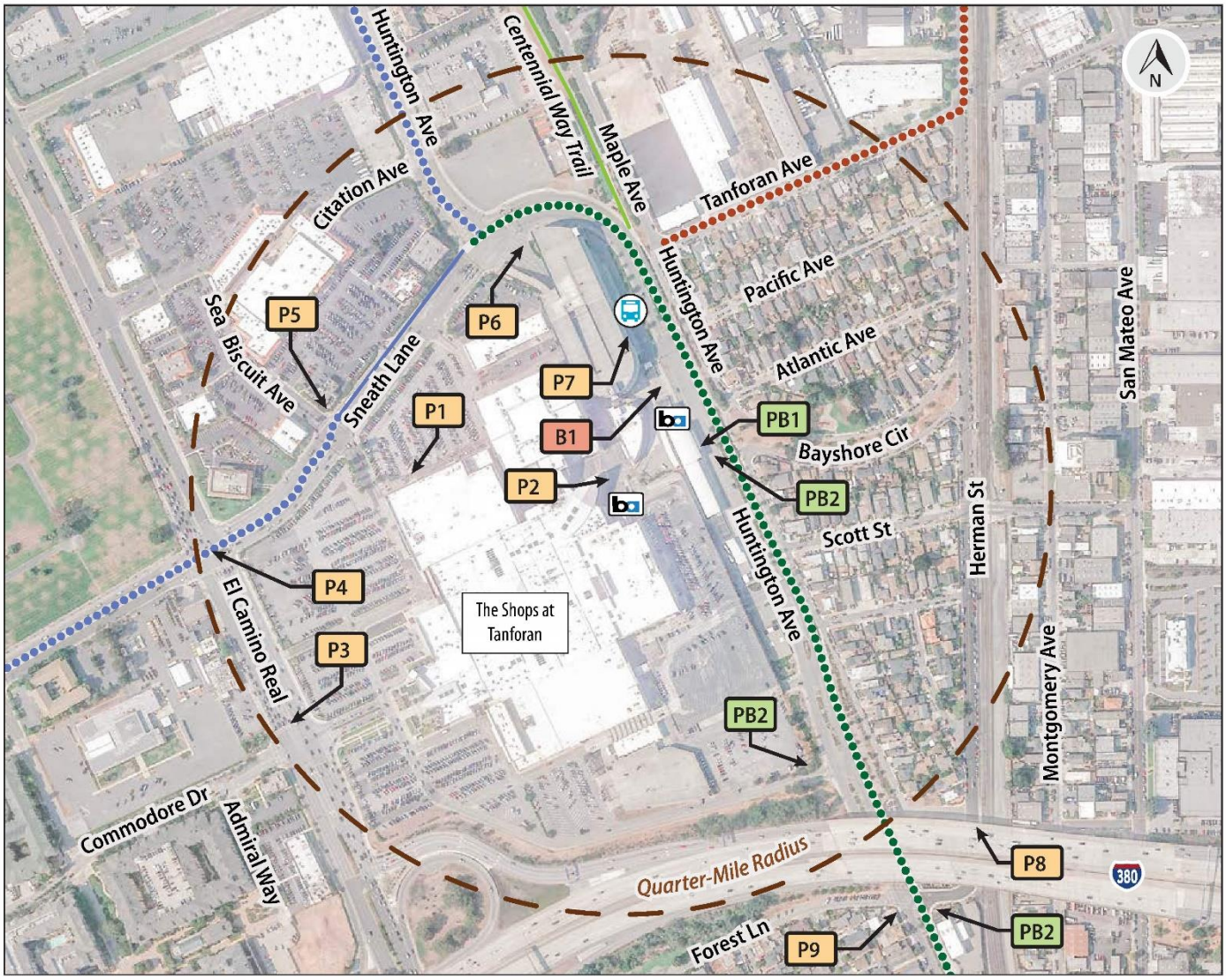
- **Station entrance (Huntington Ave.):** P7, B1 and PB1 facilitate bus, bike and walk trips to BART, respectively. P7 creates a safer and more welcoming environment for passengers waiting to transfer to SamTrans buses. B1 allows people bicycling to the station from the north – including from the Centennial Way Trail – to mount the curb adjacent to the station's largest concentration of bike parking. PB1 allows people walking and biking from the south and west to cross Huntington Avenue at the BART station entrance.
- **Huntington Ave. & I-380:** P8, P9 and PB2 and improve the walk and bike connection between the BART and Caltrain stations. P8 makes walking to the station from the south more pleasant by installing murals under the freeway. P9 makes the intersection with the eastbound freeway ramps more pedestrian-friendly. PB2 lets BART and Caltrain passengers know that the stations are less than a mile apart.
- **El Camino Real & Sneath Lane:** P1, P3, P4, P5 and P6 improve walk access for customers traveling to and from east of the station. P1 signs a walking route along the north side of the Tanforan, for when the

[20] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

mall is closed, and is a more specific application of the Station Area Wayfinding global recommendation. P3 and P4 study ways to improve the safety of walking to and from the BART station from the west. P5 installs pedestrian countdown signals at the Sneath Lane/Sea Biscuit Avenue intersection. P6 makes the pedestrian crossing of the parking structure driveway at Sneath safer.

This page intentionally left blank.

Figure 2.12 | **San Bruno Station Map**



2020

LEGEND

Existing | Planned by City

- Class I Bike Path
- Class II Bike Lane
- Class III / Bike Boulevard
- Class IV 2-Way Separated Bikeway
- BART Station Entrance
- Intermodal

Recommended

- P# Pedestrian Improvement
- B# Bicycle Improvement
- PB# Ped & Bike Improvement

See Toolkit of recommended treatments for photographs of examples, descriptions and references.

SAN BRUNO STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **North side of Shops at Tanforan** | Sign walking route through parking lot (for when mall is closed).

P2 **Shops at Tanforan to fare gates** | Erect wayfinding signs.

P3 **El Camino Real/Commodore Dr** | Study ways to calm traffic and reduce crossing distances across ECR. Consider narrowing lanes, reducing corner curb radii, reducing number of turn lanes, constructing pedestrian refuges & creating more direct crossing alignments. Align shopping center sidewalk and crosswalk.

P4 **El Camino Real/Sneath Lane** | Study ways to calm traffic and reduce crossing distances across ECR. Consider narrowing lanes, reducing corner curb radii, reducing number of turn lanes, constructing pedestrian refuges & creating more direct crossing alignments.

P5 **Sneath Ln/Sea Biscuit Ave** | Install pedestrian countdown signals.

P6 **Sneath Ln/parking structure driveway (SE side)** | Improve crosswalk. Add pedestrian refuge islands, realign crosswalk and narrow traffic lanes. Consider removing one left turn lane.

P7 **Huntington Ave at bus stops** | Improve lighting and add other amenities.

P8 **Huntington Ave under I-380** | Install murals on freeway supports and lighting (on east side).

P9 **Huntington Ave/Forest Ln** | Improve crossing by tightening curb radii.

Bicycle Safety & Access

B1 **Huntington Ave (SB at station)** | Install curb ramp to allow access from roadway to bike parking.

Pedestrian and Bicycle Safety & Access

PB1 **Huntington Ave at BART station** | Consider creating new crosswalk.

PB2 **Huntington Ave** | Install wayfinding signs to/from Caltrain station.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

San Leandro Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Change
Walk	28%	43%	1,514	2,639	74%
Bike	5%	9%	250	576	130%

Overall entries at this station by all modes increased by 15% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Balanced Intermodal / Urban with Parking
Average weekday station exits: 6,206
Parking inventory (bike/auto): 167 / 1,268

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

San Leandro Station is served by three BART lines: Blue (Daly City-Dublin/ Pleasanton); Green (Daly City-Berryessa/ North San José); and Orange (Richmond-Berryessa/ North San José). It is located west of San Leandro Boulevard and the town center, and south of SR-112 (Davis Street). San Leandro has the 22nd highest ridership out of 48 stations in the BART network, based on the 2019 ridership report. Parking fills by 8:15 AM on a typical weekday.

The station concourse is at street level, with access through the intermodal area to San Leandro Boulevard, Davis Street, Parrot Street, and west across the Union Pacific railroad (UPRR) Oakland subdivision tracks to W Estudillo Avenue. UPRR has two sets of tracks in the station's vicinity: the Oakland subdivision, which is closest to BART and is inactive, and the Niles subdivision, which is further west and is used by freight and passenger trains. Downtown San Leandro is east of the station along E 14th Street, but development has increased west of the station in recent years and more is planned. Forty-one percent of households within a half-mile of the station earn less than $50,000 per year, close to the systemwide average (see Table 2.1).

Station Area Access

According to BART's station profile studies, 43 percent of passengers accessed the San Leandro station on foot and nine percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

Pedestrians and bicyclists both travel longer distances between home and the station than is typical of the other Focus Stations in this study (see Appendix B). More travel from the east than from west of the station.

There were several reported crash clusters involving people walking and biking in the area surrounding the station between 2015 and 2017: Davis Street at San Leandro Boulevard shows a concentration of both pedestrian-involved crashes and a bicyclist-involved crash, as does Davis Street at Hays Street (see Appendix C). On E 14th Street at Davis Street, there is a concentration of pedestrian-involved crashes.

Location of Recommendations P10 and B2: Davis St between Alvarado St and San Leandro Blvd

Further south at E 14th Street and Estudillo Avenue, there is another concentration of pedestrian-involved crashes and a bicyclist-involved crash. To the south, Williams Street between Alvarado Street and San Leandro Boulevard has several pedestrian-involved crashes, including two in close proximity to the UPRR Niles subdivision tracks.

The street grid surrounding the San Leandro BART station is interrupted by the shopping center on E. 14th Street/Davis to the east, the UPRR tracks to the west and the BART station itself. Pedestrian access from both east and west of the station requires walking through a parking lot or bus intermodal area. Bikes are expected to use the parking lot to access the street; to the east, this often means mixing with buses at the exiting loop. This area is an intermodal facility that was reconstructed to accommodate AC Transit's bus rapid transit (BRT), which is scheduled to begin operations in late summer 2020. West of the station, access points are very limited, particularly considering the very long north-south block length (nearly a half-mile). A Class I shared-use path has been constructed between Davis and Parrott Street, which provides access to the station from W Estudillo Avenue and Parrott Street. It runs next to the inactive UPRR Oakland subdivision railroad tracks between the San Leandro Tech Campus buildings and BART. This section will eventually become part of the East Bay Greenway, a project that will construct a 16-mile bikeway following BART's alignment between Lake Merritt and South Hayward stations.

Davis Street is the main east-west connector street linking downtown San Leandro to the BART station and points east (on Callan Avenue). The street has high traffic volumes and speeds and does not feel welcoming for bikes or pedestrians. Sidewalks are narrow and opportunities to cross the wide street are infrequent. The bike infrastructure is disconnected and insufficiently protected from vehicles. Although narrow by comparison, San Leandro Boulevard presents a significant width to cross as a pedestrian and is a daunting street for less experienced bicyclists despite the consistent inclusion of Class II bike lanes.

Location of Recommendations PB3: W Estudillo Ave. at Hays St.

Other east-west streets leading to the downtown area from San Leandro Boulevard have a very different character, with churches, schools, single family homes and small apartment buildings. The traffic is much slower than on nearby arterial roads, despite several being quite wide. W Estudillo Avenue has a pleasant pedestrian environment with historical significance that is celebrated between the station and E 14th Street with markers and interpretive panels. The shopping center that is anchored by Safeway and CVS on E. 14th between Davis Street and W Juana Avenue provides a physical gateway to Downtown San Leandro on Hays Street at W Estudillo. Although W Estudillo is the primary walking route between the station and the downtown, there is no crosswalk at its intersection with San Leandro Street. Instead, pedestrians are expected to use the nearby signalized crossing at the bus intermodal entrance to the station.

Bike infrastructure or priority has not been concentrated on any of the smaller east-west streets, though W Juana Avenue is designated a Class III bike route without markings. Williams Street is the closest street to the south of the station to cross San Leandro Boulevard and the railway tracks. A study is planned for this corridor, which will need to consider the street's narrow and sometimes non-existent sidewalks and crosswalks, as well as bikeways, which are currently inconsistent and not physically protected from traffic.

Station Area Planning

San Leandro station has a Balanced Intermodal station access designation with aspirations to become Urban with Parking.

The southern terminus of AC Transit's first bus rapid transit (BRT) project will be at the station, after traveling on E 14th Street, Davis Street and San Leandro Boulevard. This routing will make changes to the Davis Street lane configuration that were not in place during the site visit in early 2019.

The Downtown TOD Strategy (2007) aimed to identify ways to create continuous walkways and bikeways where the downtown shopping center, BART station and UPRR tracks interrupt the street grid to make active transportation the primary choice for downtown area circulation. It also identified W Estudillo Avenue as a critical connection between downtown and the station. San Leandro's Bike and Pedestrian Plan (2018) recommends a corridor study for Davis Street, a Class IV separated bikeway for Williams Street, and designating the area around the station as a pedestrian improvement area.

Location of Recommendations P4 and P16: Williams St at UPRR

Recommendations

Recommendations at San Leandro are focused on pedestrian safety and amenity improvements immediately around the station, reconnecting the street network, and providing clear, safe, and direct routes for bicyclists to and from the station:[21]

- **Better pedestrian and bike connections around the station:** PB1 connects the existing Class I shared-use path across the UPRR tracks from the station to the BART parking lot. PB5 adds station wayfinding on W. Estudillo St at Alvarado St. P11, which is already planned as part of Eden Housing's Parrott Street Apartments, will improve the W. Estudillo Avenue connection to the station. P10, which might also be included in the apartment project, fills a sidewalk gap in the northern part of the station parking lot. PB4 reinstates an important crosswalk and makes other pedestrian improvements at the station entrance, but would require coordination with bus operations and a study of the suitability of a pedestrian hybrid beacon (PHB) along this segment. P1 improves walk and bike access on the roadway between two BART parking lots. P8 creates a better pedestrian environment by widening the sidewalk on San Leandro Boulevard.
- **Consolidating bike infrastructure on a few key streets:** Together, B4, B6 and B7 concentrate bike facilities on W Juana Avenue, which will allow for priority bike treatment at the redesigned intermodal area at the BART entrance. B2 adds either Class IV separated bikeways or Class II buffered bike lanes on Davis Street. These treatments will make it more comfortable for less confident cyclists, but will require permission from and coordination with the City, Caltrans, and AC Transit. B3 proposes similar bikeway treatments on Williams Street to provide an east-west bikeway south of the station. B5 would

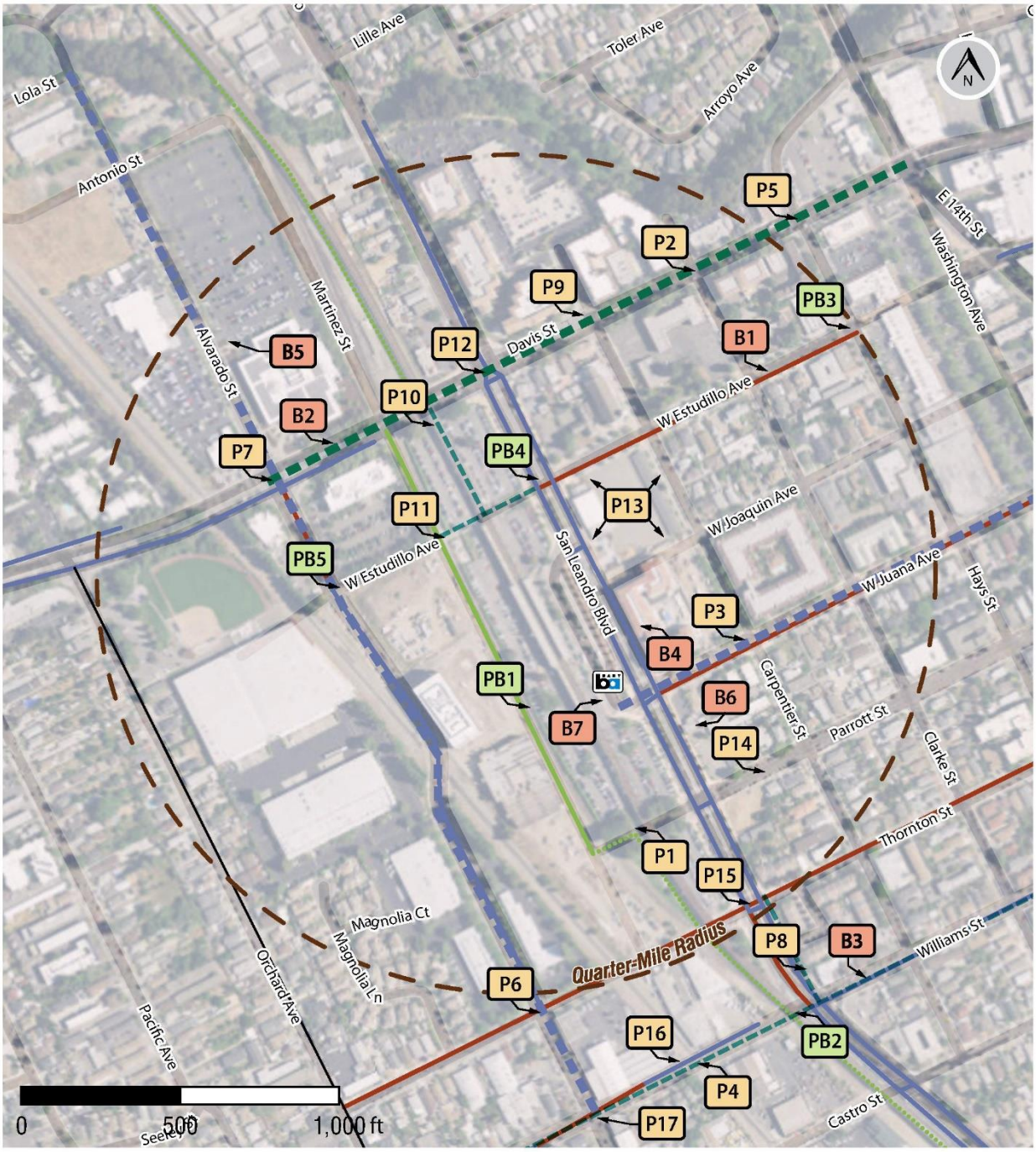
[21] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

Location of Recommendation PB4: W Estudillo Ave at San Leandro Blvd

make Class II bike lanes on Alvarado Street consistent and buffered throughout.

- **Improving pedestrian and bike visibility east of the station:** In this neighborhood, P13 uses "daylighting" to open the visual connection between pedestrians and vehicles by removing one parking space in advance of each crosswalk. P3 and P14 recommend lighting, some of which is already planned by the City. B1 changes front-in diagonal on-street parking to reverse-in or parallel parking on W. Estudillo Avenue, a good idea anywhere to improve safety for all modes of travel. PB3 (Estudillo gateway) installs an intersection speed table to calm vehicle traffic.
- **South and west of the station:** P15 recommends adding a crosswalk and RRFB on the south side of the San Leandro Boulevard/Thornton Street intersection. This intersection is very wide with a free right turn, but there are limitations to the changes that can be made in the short term with the locations of signal heads and BART overpass columns. P17 shortens crossing distances through realigning crosswalks and adding corner bulb-outs with parking at the Williams Street/Alvarado Street intersection. Williams Street is the subject of an upcoming study to determine the feasibility of a Class IV separated bikeway (consistent with B3). P4 installs myriad pedestrian improvements on Williams Street at the UPRR crossing. PB2 adds a pedestrian-bicycle crossing at San Leandro Boulevard and Williams Street, which will also be a part of the future East Bay Greenway. P6 reduces crossing distances and calms turning vehicle traffic at the Thornton Street/Alvarado Street intersection.
- **On Davis Street:** Recommendations on Davis Street require permission from and coordination with Caltrans. P7 installs ADA accessible signals at Alvarado Street, as well as a tightened curb radius to slow turning vehicles. P2 (currently under design by Caltrans), P5, P9, and P12, (under design by San Leandro) are high visibility crosswalks with approaches aligned with the path of travel and smaller curb radii. All uncontrolled crossings should consider additional enhancements, such as RRFBs or PHBs in coordination with AC Transit's BRT.

Figure 2.13 | **San Leandro Station Map**



LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Class III / Bike Boulevard
- BART Station Entrance

Recommended

- Class II Bike Lane
- Class IV Separated Bikeway
- Pedestrian Improvement
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

SAN LEANDRO STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

- **P1** **Parrott St under BART tracks** | Install HV crosswalk with RRFB
- **P2** **Davis St/Clarke St** | Install HV crosswalk with PHB on east leg
- **P3** **W Juana Ave/Carpentier St** | Install more pedestrian-scale lighting
- **P4** **Williams St/UPRR** | Fill in sidewalk gaps and install pedestrian rail crossing gates; Install HV midblock crossing with RRFB if crosswalk not installed on west leg of Williams St/San Leandro Blvd
- **P5** **Davis St/Hays St** | Install HV crosswalks
- **P6** **Thornton St/Alvarado St** | Install HV crosswalks and reduce corner radii
- **P7** **Alvarado St/Davis St** | Reduce corner radii; widen median to install pedestrian refuges on Davis St; install accessible pedestrian signals with countdown
- **P8** **San Leandro Blvd from Thornton St to Williams St** | Remove NBR lane to widen eastern sidewalk at street trees
- **P9** **Davis St/Carpentier St** | Install HV crosswalk with PHB; reduce NW corner radius; straighten north leg crosswalk
- **P10** **BART northwest parking lot** | Fill in sidewalk gap through parking lot to connect to Davis Street
- **P11** **W Estudillo Ave/Martinez St** | Provide better lighting and widen sidewalks leading into BART property; install HV crosswalks through parking lot
- **P12** **Davis St/San Leandro Blvd** | Install HV crosswalks; shorten EBR lane to widen sidewalk
- **P13** **Station area bordered by San Leandro Blvd, Davis St, E 14th St, Williams St** | Daylight all pedestrian crossings by removing one parking space in advance of each crosswalk
- **P14** **Parrott St from Martinez St to E 14th St** | Install more pedestrian-scale lighting
- **P15** **San Leandro Blvd/Thornton St** | Install HV crosswalk with RRFB
- **P16** **Williams St from Alvarado St to San Leandro Blvd** | Widen sidewalk, especially on north side where utility poles are located
- **P17** **Alvarado St/Williams St** | Change signal to split phase; remove WBL lane; install corner bulb-outs where parking is located while ensuring bus turning access needs

Bicycle Safety & Access

- **B1** **W Estudillo Ave from Carpentier St to Hays St** | Change existing front angled parking to reverse angled parking
- **B2** **Davis St from Alvarado St to E 14th St** | Install Class IV separated bikeways where space available and Class II buffered bike lanes where space is constrained
- **B3** **William St from Leonard Drive to E 14th St** | Install Class IV separated bikeways or Class II buffered bike lanes
- **B4** **W Juana Ave/San Leandro Blvd** | Install bike boxes on SBL and WBR approaches
- **B5** **Alvarado St from Lola St to Williams St** | Install Class II buffered bike lanes
- **B6** **W Juana Ave from BART to E 14th St** | Install Class II buffered bike lanes by changing front angled parking to parallel parking
- **B7** **BART bus intermodal area** | Install two-way bike access improvements from Juana Ave through station for a direct path to bike parking and the faregates

Pedestrian and Bicycle Safety & Access

- **PB1** **Tech Campus Paseo Walkway** | Create a connection between existing Class I path and station parking lot, across UPRR tracks
- **PB2** **Williams St/San Leandro Blvd** | Install a pedestrian-bike crosswalk on the western leg to connect to the future East Bay Greenway
- **PB3** **W Estudillo Ave/Hays St** | Install an intersection speed table and actuated beacons (RRFB or PHB)
- **PB4** **W Estudillo Ave/San Leandro Blvd** | Reinstate pedestrian-bike access on the south leg by installing a HV crosswalk, curb ramps at the median, and a PHB
- **PB5** **Alvarado St/W Estudillo Ave** | Install wayfinding signage to BART

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

South Hayward Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	14%	25%	469	856	83%
Bike	5%	6%	158	202	28%

Overall entries at this station by all modes increased by 5% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Balanced Intermodal / Balanced Intermodal
Average weekday station exits: 2,950
Parking inventory (bike/auto): 102 / 1,272

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

South Hayward Station is served by two BART lines: Green (Daly City-Berryessa/ North San José); and Orange (Richmond-Berryessa/ North San José). It is located on Dixon Street south of Tennyson Road. Parallel and immediately west of the BART tracks is Union Pacific Railroad's (UPRR) Oakland subdivision, which is dormant. The station concourse is at street level with a single entrance leading to a bus plaza and parking lot. South Hayward has the 43rd highest ridership out of 48 stations in the BART network, based on the 2019 ridership report. Unlike other stations with parking, the South Hayward station lot fill up.

The area west of the station is suburban low-density residential. Housing adjacent to the east side of the station is higher density transit-oriented development (TOD). Thirty-nine percent of households within a half-mile of the station earn less than $50,000 per year, slightly lower than the systemwide average of 43 percent (see Table 2.1).

Station Area Access

According to BART's station profile studies, 25 percent of passengers accessed the South Hayward station on foot and six percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

In 2015, the residences of passengers walking from home were clustered around the higher density developments to the east and throughout the low-density housing to the west (see Appendix B). The home origins of passengers who bike to this station were scattered throughout the neighborhoods east and west of the station.

Pedestrian-involved collisions between 2015 and 2017 around this station are of particular concern given the relatively low pedestrian mode share (see Appendix A). Concentrations of crashes involving pedestrians, one of which was a fatality, occurred on Mission Boulevard, at and between the intersections of Hancock Street and Tennyson Road, less than a quarter-mile apart. Pedestrian- and bicyclist-involved collisions also occurred along Tennyson Road, with clusters at the intersections of Dixon Street and Beatron Way. One pedestrian fatality also occurred on Dixon Street at Copperfield Avenue.

Location of Recommendation P3: Beatron Way-Whitman Street at Tennyson Road

There are very few opportunities to cross the train tracks (both UPRR and BART) or Tennyson Road by any mode of travel. The road network in neighborhoods to the west, with circuitous streets and no pedestrian or bicycle cut-throughs at the ends of cul-de-sacs significantly increases the walking and biking time for people who live in close proximity to the station. Despite these challenges, people walk to the station from these neighborhoods, many by informal trails that have been worn into the grass and dirt beneath the BART tracks.

Some of the most impactful improvements to pedestrian and bicycle access to the station are long-term projects beyond the scope of this study, but that are hoped to be addressed by the East Bay Greenway. These include a pedestrian-bicycle bridge across Tennyson Road, formalizing the trail on the south side of Tennyson Road under the tracks, and installing a Class IV separated bikeway on Tennyson Road. Mission Boulevard with its high traffic volumes and speeds is also a challenging road for bicyclists and pedestrians, though parallel routes like Dixon Street provide a lower-stress environment for both modes.

Station Area Planning

South Hayward station has a Balanced Intermodal station access designation that is not expected to change in the foreseeable future.

An update to the most recent Bicycle Master Plan for Hayward City (2007) is expected in 2020. A draft includes Class IV separated bikeways between Hesperian Boulevard and Mission Boulevard. All projects recommended in the BART station area in the 2007 plan have been implemented. More recently, the Tennyson Complete Street Initiative (2016) focused on increasing bicyclist and pedestrian safety through enhanced infrastructure, lighting and education.

Location of Recommendation B1: Tennyson Road

The Alameda County Transportation Commission is developing the East Bay Greenway, a 16-mile multi-use trail that will follow the BART alignment between the South Hayward and Lake Merritt stations. It represents an opportunity to introduce clear, safe, bike and pedestrian priority to the area around the station. Tennyson Road will be a key gateway to the Greenway in the station area, which will require creating ways to increase separation between the bikeway and fast-moving vehicular traffic. To make Tennyson Road appropriate for all users, separation is needed. In some small, constrained sections, this may mean a reduction in parking (e.g., under the rail bridges).

Recommendations

Although the station area was designed and developed primarily with the car in mind, there is clear potential to shape its future toward improved pedestrian and bike access, and the City is working towards that goal. Many recommended changes to the walking and biking environments in the station area are on BART property, with the rest focused on Tennyson Road, Dixon Street and Valle Vista Avenue:[22]

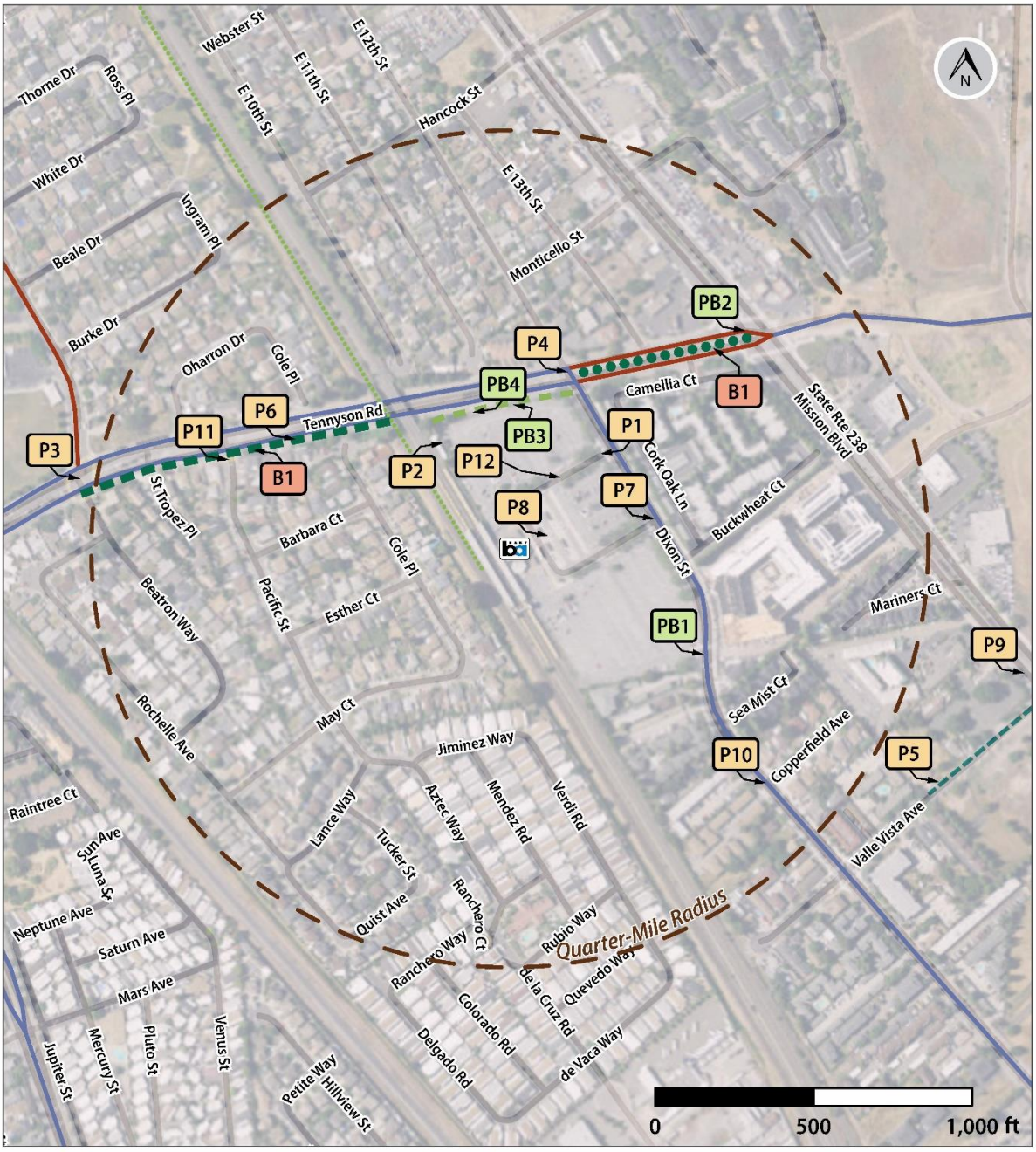
[22] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

- **On BART property:** P2 constructs a new sidewalk between an existing stairway from Tennyson Road through the parking lot and the station entrance, with improved pedestrian-scale lighting. PB3 connects the parking lot with Tennyson Road by removing a parking space and curb so the connection is ADA-compliant. PB4 constructs a Class I shared-use path along the northern edge of the parking lot to connect PB3 with P2. P8 will improve pedestrian visibility across the bus plaza by adding a high-visibility crosswalk. P12 improves the visibility for pedestrians accessing the station by installing pedestrian-scale lighting on sidewalks in the parking area.
- **On Tennyson Road:** B1 is a bold measure to significantly improve bicyclist access to the station in the medium term, installing a two-way Class IV separated bikeway between Mission Boulevard and Dixon Street. P6 is similarly ambitious by proposing sidewalk widening and pedestrian-scale lighting for the south side of the street. At pinch points, such as under the rail bridges, on-street parking may need to be removed. P3, P4, and P11 all improve pedestrian visibility at intersections and shorten crossing distances. PB2 studies ways to improve safety for people traveling by bike and on foot through the intersection with Mission Boulevard by introducing dedicated infrastructure for bike turns, reducing the length of crossings and making them more direct, and adding pedestrian refuges to reduce the stress of a long crossing.
- **On Dixon Street:** P1 adds a crosswalk on the north side of the intersection with the northern BART access road to connect with the existing sidewalk. P7 gives pedestrians additional visibility at the intersection with the BART access road by removing parking adjacent to the crosswalk. PB1 is a good location to add BART wayfinding to ensure pedestrians and bicyclists take a direct route into the station. PB1 installs advance stop bars at the intersection with the southern BART parking lot entrance to reduce vehicle encroachment into the crosswalks, giving pedestrians and bicyclists more space to cross. P10 adds a bulbout to the southwest corner of Copperfield Avenue (the only corner without one), removes vegetation to increase visibility of pedestrians, aligns curb ramps to the direction of travel, and increases the visibility of the crosswalk with a Rectangular Rapid Flashing Beacon (RRFB).
- **On Valle Vista Avenue:** P5 takes back sufficient space from the properties encroaching on the public right-of-way for a sidewalk on the north side of the street, which is likely a longer-term project. Sidewalks on the south side of the street will be constructed when the adjacent parcel is developed. P9 adds a crosswalk to complete the intersection with Mission Blvd. and realigns the existing crosswalk in the direction of travel to reduce crossing distances.

Location of Recommendation P6: Tennyson Road narrow sidewalk

This page intentionally left blank.

Figure 2.14 | **South Hayward Station Map**



LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Class III / Bike Boulevard
- Class IV Separated Bikeway
- BART Station Entrance

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

Recommended

- Class I Bike or Shared-use Path
- Class IV Separated Bikeway
- Pedestrian Improvement
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

SOUTH HAYWARD STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **Dixon St/BART access road (north)** | Install HV crosswalk on northern leg with curb ramp on eastern side

P2 **Northern BART parking lot from station entrance to Tennyson Rd** | Install sidewalk on western side to connect to existing stairs; Install pedestrian-scale lighting

P3 **Tennyson Rd/Beatron Wy-Whitman St** | Change signal timing to allow pedestrian crossings during vehicle through movements; Tighten curb radii or install corner bulb-outs on the south leg for crossing Tennyson; Straighten crosswalks; Remove WBL and EBR lanes to install median pedestrian refuges

P4 **Tennyson Rd/E 12th St-Dixon St** | Install corner bulb-outs on the NE, NW, and SE corners across Tennyson; Install HV crosswalk on the east and west legs

P5 **Valle Vista Ave from Dixon St to Mission Blvd** | Fill in sidewalk gaps on both sides of the street as development enables right of way availability

P6 **Tennyson Rd from Beatron Wy to Dixon St** | Widen sidewalk and install pedestrian-scale lighting on south side of the street

P7 **Dixon St/BART access road (south)** | Daylight intersection by removing one parking space in advance of crosswalk on south leg

P8 **BART station entrance at bus bays** | Install HV crosswalk

P9 **Mission Blvd/Valle Vista Ave** | Install HV crosswalk on the north leg together with directional curb ramps; Straighten crosswalk on south leg

P10 **Dixon St/Copperfield Ave** | Replace vegetation on northwestern side with low-profile elements and widen curb ramp; Replace existing crosswalk on north leg with a raised crosswalk and install RRFB; Reduce NE curb radius and install directional curb ramps; Reduce SE curb radius

P11 **Tennyson Rd/Pacific St** | In the short-term, tighten curb radii on the south leg by installing painted corner bulb-outs with delineators. In medium-term, tighten curb radii on south leg to install directional curb ramps; Prohibit NBL and WBL vehicle movements

P12 **BART parking lot sidewalks** | Install pedestrian-scale lighting

Bicycle Safety & Access

B1 **Tennyson Rd from Mission Blvd to Dixon St** | Reconfigure turn lanes and/or remove parking to install a Class IV, two-way separated bikeway on south side

Pedestrian and Bicycle Safety & Access

PB1 **Dixon St/BART access road (south)** | Install advance stop bars on all intersection legs; Install wayfinding signage

PB2 **Mission Blvd/Tennyson Rd** | Install median refuge on eastern leg; Study intersection to tighten curb radii, straighten crosswalks, install two-stage bike turn boxes, consolidate EBT and EBR turn lanes, and install median refuge on northern leg

PB3 **Northern BART parking lot** | Install pedestrian and bike access to connect to Tennyson Rd

PB4 **Northern BART parking lot** | Install Class I shared-use path parallel to Tennyson Rd between parked cars and station perimeter

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

South San Francisco Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	20%	37%	593	1,375	132%
Bike	1%	4%	32	154	381%

Overall entries at this station by all modes increased by 23% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Intermodal-Auto Reliant / Balanced Intermodal
Average weekday station exits: 3,403
Parking inventory (bike/auto): 56 / 1,379

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

South San Francisco station is served by two BART lines: Yellow (Millbrae/ San Francisco Airport-Antioch); and Red (Millbrae-Richmond). It is an underground station located between El Camino Real and Mission Road near the border between Colma and South San Francisco. South San Francisco has the 41st highest ridership out of 48 stations in the BART network, based on the 2019 ridership report, and parking is not typically full until 9:20am on weekdays.[23]

The station has two entrances, each located at street level, on the east and west sides of the station.[24] El Camino Real is the spine of the Peninsula's regional road network, but currently acts as a barrier to station access because it is so difficult to cross and travel along on foot or by bike. Dense mixed-use development on McLellan Drive has started to create an environment more conducive to bike and pedestrian movement north of the station. The northern end of the Centennial Way Trail is at the south edge of the station, providing low-stress bike and pedestrian access as far south as San Bruno.

One quarter of households within a half-mile of the station earn less than $50,000 per year, much lower than the systemwide average of 43 percent (see Table 2.1).

Station Area Access

According to BART's station profile studies, 37 percent of passengers walked to the South San Francisco station and four percent biked in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

Passengers who walk to the South San Francisco station live throughout the quarter-mile radius, with a concentration in the higher density developments on McLellan Drive west of El Camino Real (see Appendix B). Bike trips largely originate outside the half-mile radius on or near arterial roads that connect through neighborhoods. One pedestrian crash was recorded in the station area between 2015-2017, at El Camino Real south of McLellan Drive (see Appendix A).

In the station area, Mission Road is a signed bike route (with sharrows). McLellan Drive is a notable gap in the bike network serving the station. Between El Camino Real and Mission Road, McLellan Drive is too wide to slow traffic to a suitable speed to either comfortably accommodate bicyclists or pedestrians.

[23] Parking Inventory, 2019

[24] For orientation purposes in this section, the BART station and El Camino Real are considered to be oriented north-south. McLellan Drive and parallel streets are considered to run east-west.

Location of Recommendation B5: McLellan Drive

Although the BART station's main station entrance plaza leads directly to El Camino Real, this regionally significant roadway presents barriers to active BART station access in many ways. These include high vehicle speeds and volumes, the absence of bike facilities, wide corner turn radii, long crossing distances, and walled development, which creates the need to travel much farther than "crow flies" distances.

Mission Road northeast of the station is identified in the county congestion management plan as another regionally important vehicle throughway. This may limit the prospects of significantly improving pedestrian and bike infrastructure on or across this street in the near-term. The Centennial Way Trail is an unmarked Class I shared-use path south of the South San Francisco station that leads to the San Bruno station to the south.

Station Area Planning

South San Francisco is currently designated with a station access typology of Intermodal-Auto-Reliant with the aspiration of becoming Balanced Intermodal in the future.

The most recent Bicycle Master Plan for the City of South San Francisco was adopted in 2011, and the Pedestrian Master Plan in 2013. The bike plan recommends Class II bike lanes for McLellan Drive between El Camino Real and Mission Road. South San Francisco is working on updating and combining their pedestrian and bicycle plans in Active South City, expected to be completed in 2020.

The 2013 pedestrian plan identified key gaps in the sidewalk network (including on McLellan Drive, which is planned for completion as part of a new development on the northwest corner of Mission Road and McLellan Drive) and recommended a road diet for Mission Road near the BART station. Colma's 2014 Land Use and Urban Design Strategy identifies Mission Road at McLellan Drive as a town gateway.

The Grand Boulevard Initiative, a consortium of jurisdictions and other organizations along the Peninsula, encourages improvements to El Camino Real, including better crosswalks, wider sidewalks and filling bike lane gaps. As part of the Grand Boulevard Initiative Phase 2, Caltrans is installing enhanced pedestrian crossings, corner bulb-outs and median refuges at two intersections on El Camino Real between McLellan Drive and the Kaiser Way. While such improvements are necessary, they are unlikely to significantly change the primary function of this road or its character around the station in the near-term.

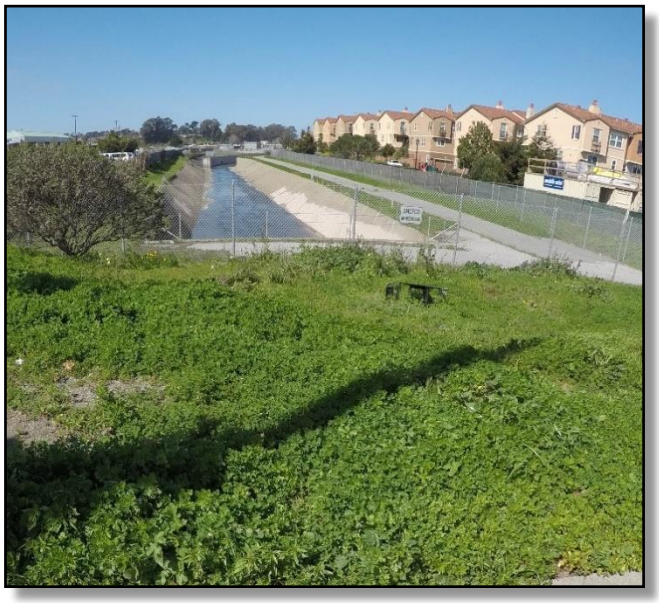
Location of Recommendations P5 and P6: BART Driveway at Centennial Way Trail

Recommendations

Despite the high-speed and -volume roads surrounding the South San Francisco BART station, there are many opportunities to improve pedestrian and bicycle connectivity in the area. By concentrating supportive infrastructure at important intersections, access to smaller, local streets and neighborhoods could be substantially improved. The station itself has

several gaps in sidewalk connectivity that can be addressed in the short term and make pedestrian access more intuitive and direct.[25]

- **On BART property:** Some of these recommendations will require collaboration with and permission from the San Mateo County Transit District (SamTrans), which owns portions of the BART station area. P1, P4, P6, and P7 fill sidewalk gaps around the BART station where there are "desire lines" today. P4 constructs sidewalk on the north side of the BART access road, to connect the station entrance with the crosswalk across El Camino Real. P2 and P4 add pedestrian-scale lighting for safety, wayfinding and creating a more welcoming environment. B1 enables two-way bike access at the one-way parking lot driveway at Mission Road and Evergreen Drive. B3 recommends locating bike parking closer to the station entrance, either onto the station plaza or adjacent to the entrance. It will also feel safer and encourage people to use the bike parking if it is in a more visible area subject to casual surveillance from other BART passengers. B6 adds bicycle stairway channels on the northernmost set of stairs on the east side of station to provide an alternative access to the ADA ramp.
- **Centennial Way Trail:** With better connections to the station and surrounding neighborhoods, this Class I shared-use path represents a real opportunity to improve bike and pedestrian access to the BART station. PB1 recommends that the existing fenced-in path alongside Colma Creek north of the station be made accessible and connected through the BART station as a direct and intuitive continuation of the existing Centennial Way Trail. PB2 and PB5 are both proposed new access points to the trail from neighboring communities, and PB4 adds a bridge to connect with Kaiser Permanente on the west side of the creek.
- **On Mission Road:** B2 recommends upgrading the existing Class III bike route to a Class IV separated bikeway or Class II bike lanes by installing a road diet, as has previously been proposed. P12 will increase the prominence of pedestrians and shorten the crossing distance at the intersection with McLellan Drive. P8 "daylights," removes parking at crosswalk approaches to improve visual connections between drivers and pedestrians. P11 and P13 improve walking conditions across and along Mission Road at Sequoia Avenue. PB3 is a component of a long-term aspiration to open access on the existing east/west PG&E alignment east of the station between Mission Blvd and at least Baywood Avenue or as far east as Hillsdale Boulevard, which would significantly improve pedestrian and bike access between the eastern neighborhoods and the station.
- **On El Camino Real:** Any projects on this roadway will require coordination with and permission from Caltrans. P10 recommends completing the



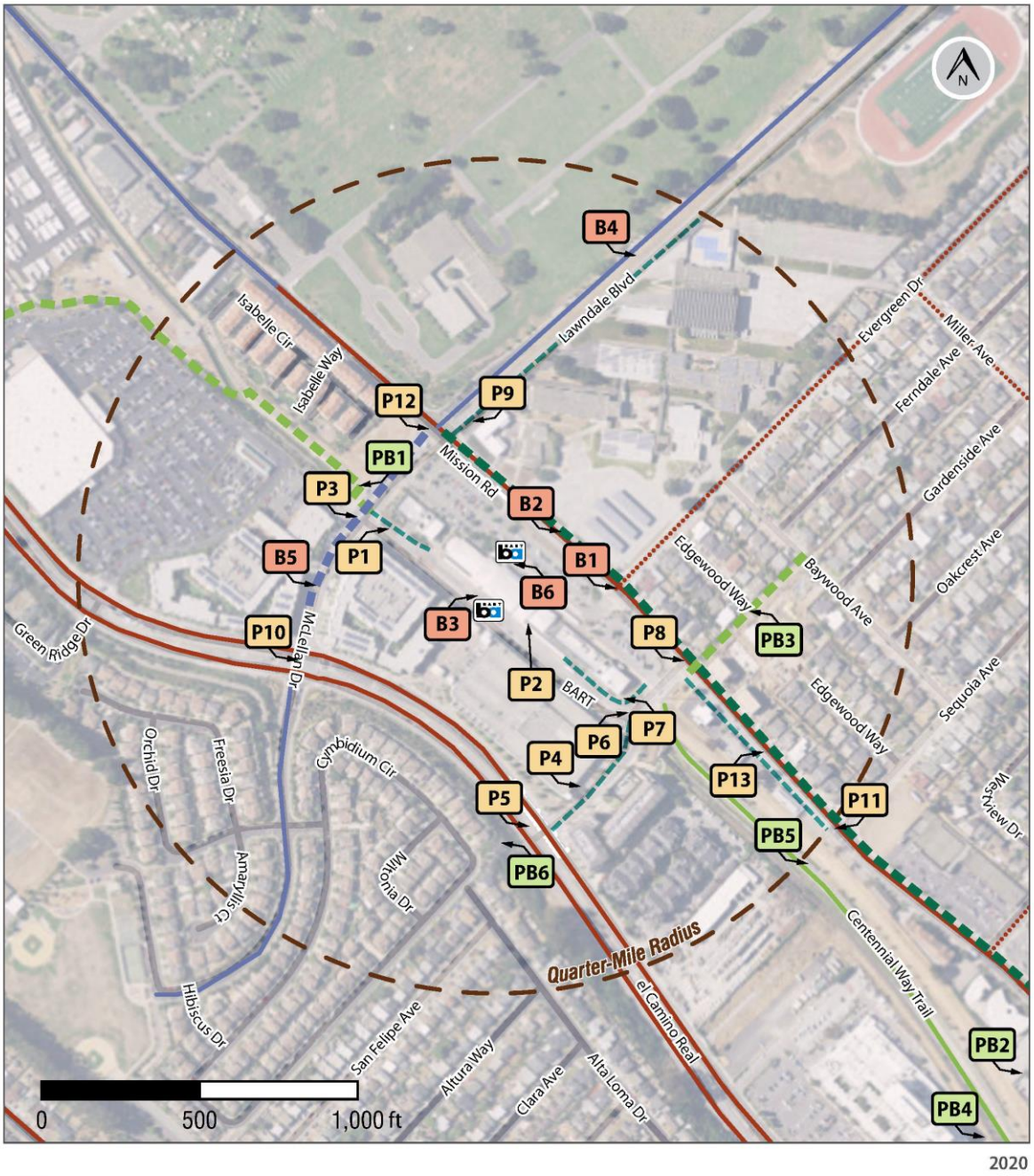
Location of Recommendation PB1: Colma Creek

[25] Recommendations do not include detailed changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

crosswalk legs at the intersection with McLellan Drive, as well as adding corner bulb-outs to reduce crossing distances and improve sightlines. P5 reduces pedestrian crossing distances at the intersection with the BART driveway and limits the wait time to cross.

- **On McLellan Drive/Lawndale Boulevard:** McLellan Drive would have more of the character of a neighborhood street with improved pedestrian and bike infrastructure and continued land development for greater mixed-use density. B5 recommends closing the gap in the bike network between Mission Road and El Camino Real. B4 enables those traveling to and from the school on Lawndale to cross through the median into the school driveway. P3 suggests narrowing the Trader Joe's driveway with a bulb-out to minimize pedestrian crossing distance and calm vehicle speeds. P9 recommends completing the sidewalk network on the southeast side of Lawndale Boulevard.
- **West of El Camino Real:** PB6 improves active access to and on the public staircase between Alta Loma Drive and El Camino Real by enhancing the path, adding better lighting, allowing access from north of Alta Loma and constructing bike channels on the stairway.

Figure 2.15 | South San Francisco Station Map



LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Class III / Bike Boulevard
- BART Station Entrance

Recommended

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Class IV Separated Bikeway
- Pedestrian Improvement
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

SOUTH SAN FRANCISCO STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **BART access road (west) from McLellan Dr to bus bays** | Fill in sidewalk gap on east side of access road and install crosswalk across facilities driveway

P2 **BART access road (west) from McLellan Dr to end of bus bays** | Install pedestrian-scale lighting

P3 **McLellan Dr/Trader Joe's driveway** | Square off or bulb-out NE driveway to reduce pedestrian crossing distance

P4 **BART access road (south) from El Camino Real to Centennial Way Trail** | Fill in sidewalk gap on north side of road with crosswalks across all garage driveways; Install pedestrian-scale lighting; Replace landscaping with lower profile vegetation

P5 **El Camino Real/BART access road** | Tighten radii on eastern corners; Install median refuge, reduce waiting time for pedestrian signal phase, and straighten crosswalk on north leg

P6 **BART access road (west)/BART access road (south)-Centennial Way Trail** | Reconfigure intersection to reduce vehicle speeds, add HV crosswalks on east and north legs, and install curb ramps

P7 **BART access road (west) from BART access road (south) to bus bays** | Fill in sidewalk gap on east side of access road and install crosswalk across facilities driveway

P8 **Mission Rd/BART access road (south)** | Daylight south leg crosswalk by removing one parking space for the approach; Replace existing crosswalks with HV crosswalks

P9 **Lawndale Blvd from Mission Rd to El Camino High School access points** | Install sidewalk on the south side and create pedestrian openings that lead to the school's sidewalks and facility entrances; Install HV crosswalks across school access road at access points

P10 **El Camino Real/McLellan Dr** | Add bulb-outs or tighten radii on the eastern corners; Install HV crosswalk and directional curb ramp on north leg; Install median refuge on north and south leg

P11 **Mission Rd/Sequoia Ave** | Install bulb-outs with directional curb ramps on eastern corners; Install HV crosswalk on north leg with directional curb ramp

P12 **McLellan Dr/Mission Rd** | Install bulb-out on northwestern corner to shorten distance across McLellan Dr; Replace all crosswalks with HV crosswalks

P13 **Mission Rd from BART access road (south) to Sequoia Ave** | Widen sidewalk on western side of street where utility poles are found

Bicycle Safety & Access

B1 **BART exit at Mission Rd/Evergreen Dr** | Install 2-way separated bikeway through egress driveway

B2 **Mission Rd from Grand Ave to McLellan Dr** | Install road diet with Class II bike lanes or Class IV separated bikeways

B3 **Western station entrance** | Relocate existing or add bike parking closer to the station entrance

B4 **Lawndale Blvd/El Camino High School swimming pool area** | Install a bike cut-through in median and bike entrance at school driveway

B5 **McLellan Dr from Mission Rd to El Camino Real** | Install Class II buffered bike lanes on both side of the street by converting front angled parking to parallel parking

B6 **BART station eastern entrance** | Install bicycle stair channels on both sides of the northern-most stairs

Pedestrian and Bicycle Safety & Access

PB1 **Colma Creek maintenance road from McLellan Dr to Hickey Blvd** | Install Class I shared-use path and provide access and wayfinding through BART station area from Centennial Way Trail; Study connecting path to Hickey Blvd

PB2 **Grand Ave/Mission Rd** | Install pedestrian-bicycle access to Centennial Way Trail using an easement

PB3 **PG&E ROW from Mission Rd to Baywood Rd** | Study installing Class I shared-use path with pedestrian-scale lighting

PB4 **Kaiser Permanente driveway from El Camino Real to Centennial Way Trail** | Install Class 2 bike lanes and a pedestrian-bicycle bridge over Colma Creek to connect to trail

PB5 **Sequoia Ave/Mission Rd** | Install pedestrian-bicycle access to Centennial Way Trail using an easement

PB6 **Cymbidium public stairway from Alta Loma to El Camino Real** | Reopen or remove fenced gates to allow pedestrian and bicycle access to the path and stairway from the northeastern neighborhoods; Enhance path; Install lighting and wayfinding signage; Install bike stair channels on both sides of stairway

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

Union City Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	17%	23%	668	1,212	81%
Bike	2%	5%	82	280	241%

Overall entries at this station by all modes increased by 29% between 2008 and 2015.

Current/Aspirational BART Station Access typology: Intermodal-Auto Reliant / Balanced Intermodal
Average weekday station exits: 4,725
Parking inventory (bike/auto): 133 / 1,144

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

Union City Station is served by two BART lines: Green (Daly City-Berryessa/ North San José); and Orange (Richmond-Berryessa/ North San José). It is located south of Decoto Road and west of Union Square. The ground-level concourse leads to Union Square on the west side of the station.[26] Union City has the 31st highest ridership out of 48 stations in the BART network, based on the 2019 ridership report. Union City provides two public parking lots east of the station with 700 parking spaces, which are under contract for conversion to housing and offices by 2025. These lots fill by 7:20am on a typical weekday.

Sixteen percent of households within a half-mile of the station earn less than $50,000 per year, less than half of the systemwide average of 43 percent (see Table 2.1).

Station Area Access

According to BART's station profile studies, 23 percent of passengers accessed the Union City station on foot and five percent by bike in 2015, both higher than in 2008 (the most recent years for which data is available; see table at left). Coupled with increasing ridership from the station, there are growing numbers of people walking and biking in the station area.

Most people walking from home come from north of the station, but there is a cluster that arrives from Avalon Bay and Verandas apartments located immediately south of the station (see Appendix B). Home-to-station trips by cyclists appear in a few clusters north of the station but are otherwise scattered beyond the half-mile radius around the more continuous streets like Alvarado-Niles Road and Decoto Road, which have bike lanes, but are not otherwise welcoming for people traveling by bike.

In 2015-2017 there were two clusters of collisions involving pedestrians within a quarter-mile of the Union City station: both on Decoto Road (see Appendix A). Collisions with bicyclists within a half-mile of the station were more dispersed, but most were on Decoto Road or Alvarado Niles Road.

Although some work has gone into providing bike infrastructure around the station, busy arterials like Decoto Road and Alvarado Niles Road are substantial barriers to increasing bike and pedestrian access to the station and destinations in the surrounding area. Decoto Road is a major arterial that will benefit in the long term from relief brought by the Quarry Lakes Parkway (formerly known as the East-West Connector), a major new multi-modal transportation corridor with Class 1 multi-use paths and Class IV separated bikeways. The three-mile-long Parkway is planned to roughly parallel to and south of Decoto Road between Paseo Padre Parkway and Mission Boulevard. With a reduced reliance on Decoto Road for

[26] For orientation purposes in this section, the BART station and tracks are considered to run north-south, as are Alvarado- Niles Road and parallel roadways. Decoto Road and parallel roadways are considered east-west.

traffic, it can become a more neighborhood-scale street, and its intersections can be rebuilt to match the changing character of adjoining areas.

Pedestrian and cyclist entry to the station from the west at Union Square is pleasant and direct. There is a clear visual connection to the fare gates once on BART property. Union Square is already a low-volume and low-speed street but, with blind corners, there are risks to bicyclists being sideswiped by cars. Station Way, with a signalized intersection at Decoto Road, provides access for pedestrians and cyclists from Kennedy Park and the Decoto neighborhood directly to the BART entry gates. Challenges to providing access to neighboring properties for pedestrians and bikes are unlikely to be addressed in the short term because the existing buildings are orientated away from the station. These challenges should be addressed in any future redevelopment of the retail area west of the station.

Significant investment has gone into place-making and active mobility in the area east of the station. A second bicycle and pedestrian entrance to the BART station is anticipated to open from the 11th Street Plaza by 2021. Union Pacific Railroad (UPRR) and the California Public Utilities Commission have issued permits for an at-grade crossing, which is vital to providing direct active access to the mixed-use developments east of the station.

Station Area Planning

Union City is currently designated with the station access typology of Intermodal/Auto-Reliant with ambitions to transition to Balanced Intermodal in the future, reflecting ongoing changes in the area around the station. Planned and recently built medium-density, transit-oriented-development east of the station will promote increased pedestrian and bike access to BART. The 2012 Union City Pedestrian and Bicycle Master Plan is in the process of being updated, but the older document includes Decoto Road as a pedestrian improvement area and highlights the importance of a connection through the station once the eastern entrance is opened. It also shows the potential future Quarry Lakes Parkway.

Location of Recommendation PB1: Union Square at station entrance

Recommendations

In these recommendations, improvements to Decoto Road are recommended to occur with the resurfacing that is planned for the near term. In the longer term, assuming the Quarry Lakes Parkway is constructed, reconsideration of the entire Decoto Road right-of-way will enable improvements for bike and pedestrian station access. Near-term recommendations include the following:[27]

- **Decoto Road:** B3 would provide a lower stress bike environment on Decoto Road, which is currently a very high-speed and -traffic volume environment. PB5 is an opportunity to install a protected intersection, where new curbs can be installed to provide refuge to bikes, shorten the turn radius for standard vehicles and shorten crossing distances for those walking. P1 will increase pedestrian visibility at driveways and remind cars to slow down. P3, P4, and P5 are all directed at improving the pedestrian

[27] Recommendations do not include changes to BART parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

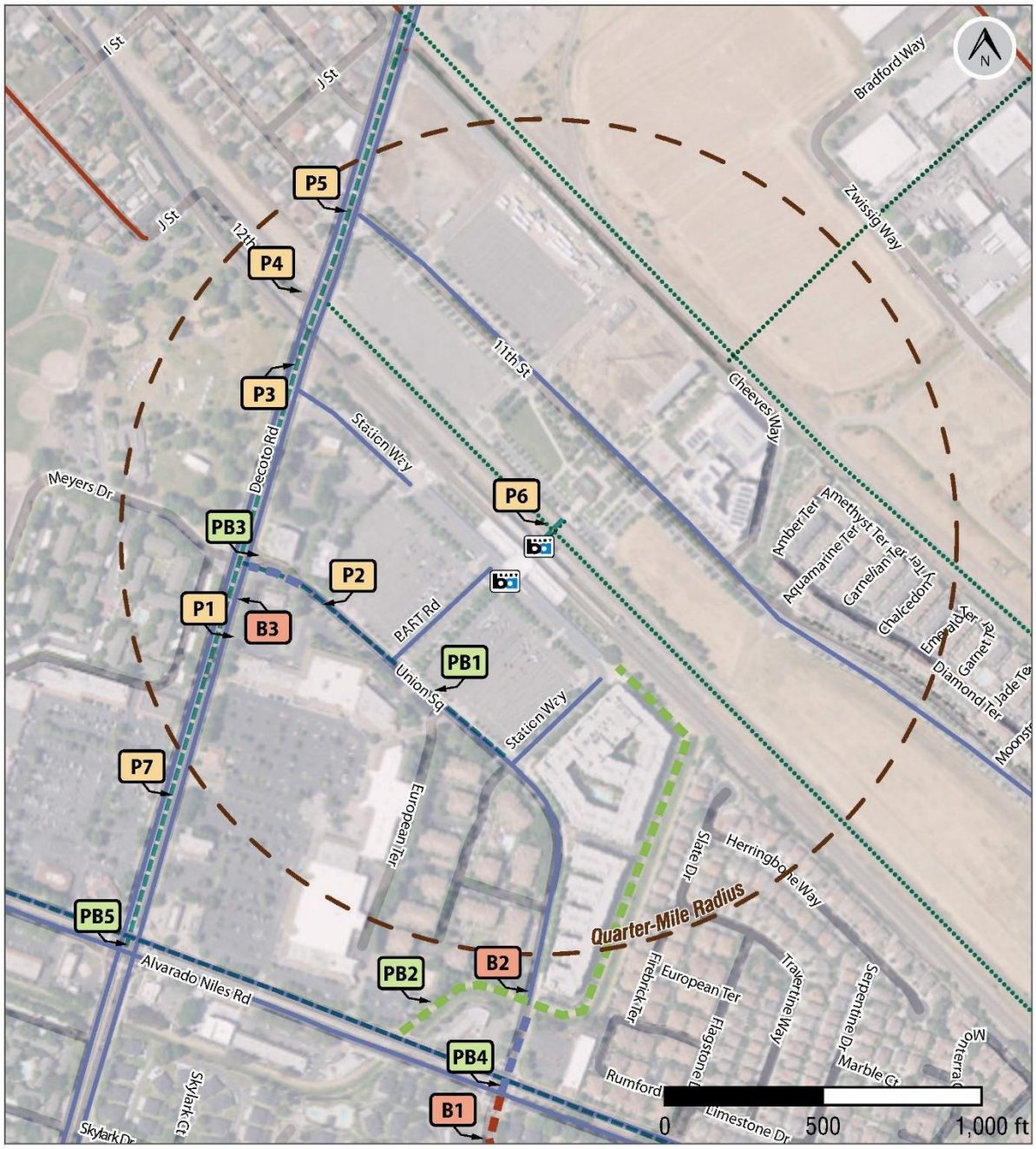
Location of Recommendations P6 and P7: 11th Street at public plaza

experience around the station by making access more direct and reducing exposure to traffic with shorter crossing distances. P7 widens the Decoto Road sidewalk for any section will make the environment more inviting for pedestrians and reinforce their priority.

- **East of BART:** P6 has been planned to provide a pedestrian and bicycle access point on the eastern side of the station and is due to be open in 2021. It will dovetail with the City's planned improvement to provide a pedestrian promenade from 7th Street to Cheeves Way as housing and office are developed.
- **West of BART:** PB1 makes the existing BART entrance more visible to passengers walking and biking from the south. Similar to P1 on Decoto Road, P2 increases pedestrian visibility and reminds drivers that they are entering a pedestrian space when they cross over the sidewalk. PB2 is a path already mostly paved but blocked from use after local opposition. This type of path presents a low-stress network opportunity for both pedestrians and bicyclists to reach destinations throughout the community. B2 ensures safe bicyclist access to the station. PB3 and PB4 would enable safe access from either Alvarado-Niles Road or Decoto Road. B1 provides a designated bike route on Mann Avenue from residential areas which leads to a low-stress bikeway to the station.

This page intentionally left blank.

Figure 2.16 | **Union City Station Map**



LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class II Bike Lane
- Class III / Bike Boulevard
- Pedestrian Improvement
- BART Station Entrance

Recommended

- Class I Bike or Shared-use Path
- Class II Bike Lane
- Class III Bike Lane
- Pedestrian Improvement
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

UNION CITY STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **Decoto Rd from Union Square-Meyers Dr to Alvarado-Niles Rd** | In short-term on the south side of the street, install HV crosswalks on the sidewalk at all driveways and the Union Square Marketplace entrance; In medium-term, create level sidewalks at driveways to calm vehicle speeds.

P2 **Union Square from Decoto Rd to Station Wy** | In short-term, install HV crosswalks on the sidewalk at all driveways on west side; In medium-term, create level sidewalks at driveways to calm vehicle speeds.

P3 **Decoto Rd/Station Wy** | Install HV crosswalk on south leg and adjust signal timing as needed; Install directional curb ramps on three corners.

P4 **Decoto Rd/12th St** | Install HV crosswalk with RRFB on western leg and relocate western stop bar.

P5 **Decoto Rd/11th St** | Tighten curb radii where possible; Install bulb-outs on northern leg to reduce 11th St crossing distance.

P6 **UPRR/BART station entrance (east)** | Install pedestrian and bicycle access across the railroad tracks.

P7 **Decoto Rd from Alvarado Niles Rd to Cheeves Wy** | Widen sidewalk to eight feet on both sides of the roadway, install directional curb ramps and level sidewalks at driveways.

Bicycle Safety & Access

B1 **Mann Ave from Hollyhock St to Alvarado Niles Rd** | Install Class III bike route with HV sharrows.

B2 **Union Square from Alvarado Niles Rd to BART Rd** | Remove parking on one side of street to install Class II buffered bike lanes on both sides.

B3 **Decoto Rd from Alvarado Niles Rd to Mission Blvd** | Install buffers on existing Class II bike lanes on both sides of the street.

Pedestrian and Bicycle Safety & Access

PB1 **Union Square from Station Wy to BART Rd** | Install pedestrian-scale lighting and wayfinding to the station.

PB2 **Alameda Creek from Alvarado-Niles Rd to BART station** | Install Class I shared-use path w/ ped-scale lighting and HV street crossings; Obtain easement on access road E of Avalon apartments.

PB3 **Union Square/Decoto Rd** | Study consolidating NBT and NBL lanes to continue NB Class II bike lane to intersection; Install SB Class II buffered bike lane from intersection to connect to existing Class II bike lane; Tighten curb radii on southern corners.

PB4 **Alvarado-Niles Rd/Union Square-Mann Ave** | Install corner bulb-outs to shorten crossing distances across Alvarado-Niles Rd; Straighten crosswalks; Install two-stage left bike turn boxes.

PB5 **Alvarado-Niles Rd/Decoto Rd** | Install protected intersection.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

West Dublin/Pleasanton Station

Station Access Data

Access Mode	Mode Share 2008	Mode Share 2015	Station Entries 2008	Station Entries 2015	Station Entries Change
Walk	N/A	26%	N/A	977	N/A
Bike	N/A	3%	N/A	124	N/A

There is no 2008 data because this station opened in 2011.

Current/Aspirational BART Station Access typology: Auto-Dependent / Auto-Dependent
Average weekday station exits: 3,606
Parking inventory (bike/auto): 110 / 1,190

Sources

- *Entries & access modes: 2015 & 2008 Station Profile Studies*
- *Station exits: 2019 Ridership Report*
- *Bike parking inventory & occupancy: Fall 2019 survey*
- *Vehicle parking inventory: Spring 2019 survey*

Station Area Context

West Dublin/Pleasanton station is served by the Blue (Daly City-Dublin/ Pleasanton) BART line. It is in the median of I-580, north of Stoneridge Mall in Pleasanton and south of Golden Gate Drive in Dublin. It has the 39th highest ridership out of 48 stations in the BART network, based on the 2019 ridership report, with parking lots that fill up before 8:30 AM on a typical weekday. Access to the station is from the north and south via pedestrian bridges over the freeway, separating riders from traffic.

The area around the West Dublin/Pleasanton station is suburban, although recent development immediately north of the station has created a denser and more walkable area. The world headquarters of Workday Inc. opened adjacent to the station in 2019, and is a major trip generator. Less than 20 percent of households within a half-mile of the station earn less than $50,000 per year, less than half of the systemwide average of 43 percent (see Table 2.1).

Location of Recommendation P3: Stoneridge Mall Road at Canyon Way

Station Area Access

According to BART's station profile studies, 26 percent of passengers accessed the West Dublin/ Pleasanton station on foot and three percent by bike in 2015 (the most recent year for which data is available; see table at left). Passengers who walk to this station primarily live north of I-580 within a quarter-mile of the station near the dense development south of Dublin Boulevard (see Appendix B). More home-based cyclists live in Dublin than in Pleasanton and nearly all travel more than a half-mile to the station. There is one collision cluster on Stoneridge Mall Road southeast of the station, where crashes involved pedestrians and bicyclists (see Appendix A).

Access to the West Dublin/Pleasanton station proper is via pedestrian bridges above the freeway, each leading to street-level station areas dominated by parking structures (Dublin's to the north and Pleasanton's to the south). Bridge entrances are sometimes difficult to find. Walking and biking north of the station feels easy and safe, particularly where dedicated infrastructure is installed such as on Golden Gate Drive. Through a Federal Transit Administration grant, BART recently made some multimodal access improvements to the north entrance, including corner bulb-outs, improved crosswalks, lighting, signage and landscaping. The environments further north on Dublin Boulevard and south around the Stoneridge Mall are much more vehicle-dominated, with fewer

Location of Recommendation PB1: Dublin Boulevard at Regional Street

facilities for pedestrians and bicyclists. Proximity to the I-680/ I-580 interchange permeates the character of the station area, with freeway speeds influencing local streets. To take full advantage of the dense residential development near the West Dublin/Pleasanton station, in the long term, walk and bike improvements will be needed. In the meantime, both cities are making changes to start this process. Workday is significantly increasing their workforce on the Pleasanton side of the station, and have made improvements for pedestrian and bicyclist access around the BART garage.

Despite having sidewalks and sharrows, the character, scale, speed and volume of traffic on six-lane Dublin Boulevard create a challenging walking and biking environment, particularly without physically protected infrastructure. As commercial and residential infill development comes to Dublin Boulevard, pedestrian and bicyclist traffic can be expected to increase. Changes to the roadway configuration could facilitate active access in the area. Because this is the only street to cross the extent of Dublin east to west (including crossing freeway interchanges), it will be difficult to reduce vehicle capacity in the near-term; however, bicyclists have the same basic access needs as motorists: to travel on both regionally- and locally-connected and continuous roads to access goods and services. Equally important, bicyclists and pedestrians need the ability to get across freeway barriers in multiple places. Freeway crossings are focused on major roadways, which also restricts walking and biking in the area.

Station Area Planning

West Dublin/Pleasanton currently has an Auto-Dependent station access typology designation, which is not anticipated to change in the foreseeable future.

The most recent pedestrian and bike plan for the City of Dublin was in 2014; an update commenced in 2020. Dublin is in the process of developing a Downtown Streetscape Plan. In the station area, this plan will detail improvements to Regional Street and Village Parkway. The City of Pleasanton adopted its most recent Bicycle and Pedestrian Master Plan in 2018.

Further redevelopment of Stoneridge Mall in the long-term represents a great opportunity to improve walk and bike access in this part of Pleasanton. Workday continues to grow its presence in Pleasanton around the station and is a key stakeholder in the future of bicyclist and pedestrian activity at West Dublin/Pleasanton station.

Location of Recommendation PB2: St Patrick's Way future shared passageway

Recommendations

Long-term projects that have been excluded from this study include significant changes to Dublin Boulevard and opening the Alameda County Water District

channel maintenance access way as a Class I shared-use path.

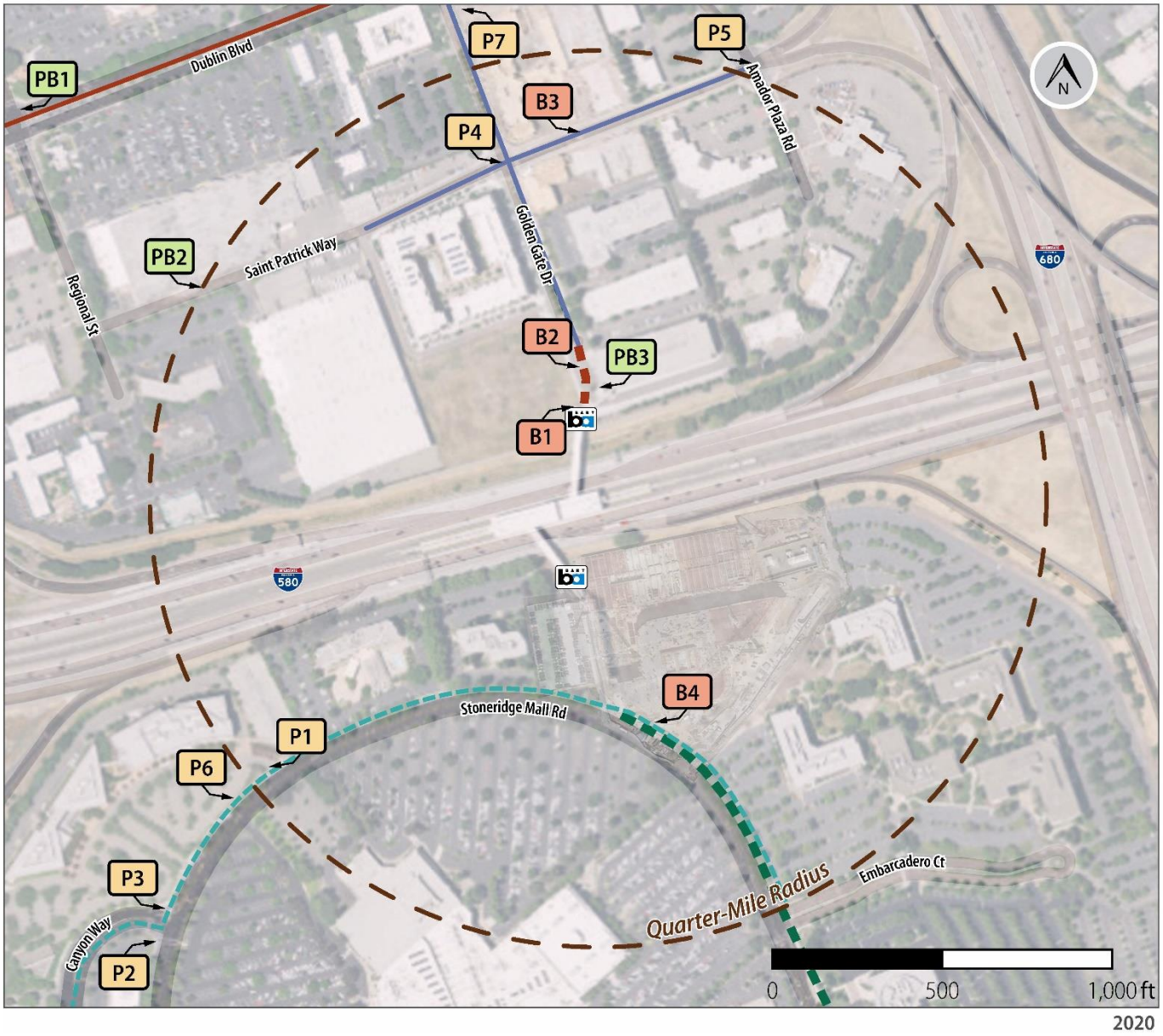
As the cities of Dublin and Pleasanton continue to develop in the station area, increasing population make it even more important to improve bicyclist and pedestrian access to and from the station and between developments. Many of the following near-term recommendations are already included in the cities' plans around this station:[28]

- **On Dublin Boulevard:** P7 improves pedestrian safety and convenience with tighter corner radii to slow turns by motor vehicles, while reducing overall signal cycle lengths.
- **On Regional Street:** PB1 implements a road diet, called for in the draft Dublin Streetscape Plan.
- **On St Patrick Way:** P4 and P5 reduce crossing distances and make pedestrians more visible. B3 recommends further study into buffering the existing bike lanes. PB2 recommends creating a shared passageway connecting to Regional Street, as planned by Dublin, including high-visibility crosswalks where the shared passageway intersects with Regional Street.
- **At northern station entrance:** B2 makes bicyclists traveling through the traffic circle more visible with the addition of high-visibility sharrows. PB3 improves wayfinding to the station elevator as its location is unclear. B1 adds stairway channels to allow passengers to wheel their bikes up and down the stairs, so those who cannot carry their bikes needn't rely on the station elevator.
- **On or near Stoneridge Mall Road:** B4 will increase safety for bicyclists as Workday continues to expand in Pleasanton by installing a Class IV separated bikeway on the outer ring of Stoneridge Mall Road. P1, P3 and P6 improve walking conditions on the outer ring of Stoneridge Mall Road by completing and widening the sidewalk, and increasing visibility at driveways using striping, painted corner bulb-outs and alignment of curb ramps with the direction of travel. P2 constructs a new sidewalk on the south side of Canyon Way from Foothill Road to Stoneridge Mall Road. (Workday plans to build the southern segment of the sidewalk; connecting to Stoneridge Mall Road will need to be coordinated with the adjacent property owners.

[28] Recommendations do not include changes to bicycle parking because BART staff is proactively monitoring and adding supply of all types of bike parking to meet demand. See 2017 BART Bicycle Program Capital Plan for details.

This page intentionally left blank.

Figure 2.17 | **West Dublin/Pleasanton Station Map**



LEGEND

Existing | Planned by Jurisdiction / Other Agency

- Class II Bike Lane
- Class III / Bike Boulevard
- BART Station Entrance

Recommended

- Class III Bike Route
- Class IV Separated Bikeway
- Pedestrian Improvement
- P# Pedestrian Improvement
- B# Bike Improvement
- PB# Ped & Bike Improvement

See Toolkit and Global Recommendations for photographs of examples, descriptions, and references.

WEST DUBLIN/PLEASANTON STATION-SPECIFIC RECOMMENDATIONS

Pedestrian Safety & Access

P1 **5928 Stoneridge Mall Rd** | Install painted bulb-outs with vertical delineators at parking lot entrance.

P2 **Canyon Wy from Stoneridge Mall Rd to Foothill Rd** | Fill in sidewalk gap on south side of street by coordinating with land owners and Workday.

P3 **Stoneridge Mall Rd/Canyon Way** | Install pedestrian-scale lighting, signalization, pedestrian actuation, and HV crosswalk at channelized right turn lane.

P4 **St Patrick Way/Golden Gate Dr** | Tighten curb radii and straighten crosswalks.

P5 **Amador Plaza Rd/St Patrick Way** | Tighten curb radii, install HV crosswalks and pedestrian-scale lighting.

P6 **Stoneridge Mall Rd from Embarcadero Ct to Canyon Way** | Widen sidewalks, install directional curb ramps and HV crosswalks across driveways.

P7 **Dublin Blvd/Golden Gate Dr** | Tighten curb radii and straighten crosswalks.

Bicycle Safety & Access

B1 **BART station entrance/Golden Gate Dr** | Install bike stair channels.

B2 **Golden Gate Dr from roundabout to BART parking** | Install Class III bike route with HV sharrows.

B3 **St Patrick Way from Amador Plaza Rd to Connolly Station access road** | Study installing or upgrading existing bike lanes to Class II buffered bike lanes as part of future bike and pedestrian plan.

B4 **Stoneridge Mall Rd from Fabian Ct to BART station entrance** | Install Class IV two-way separated bikeway on northeast side of road.

Pedestrian and Bicycle Safety & Access

PB1 **Regional St (entire extent)** | Install road diet.

PB2 **St Patrick Way from Connolly Station access road to Regional St** | Install shared passageway with HV crossing treatments.

PB3 **BART northern parking garage** | Install wayfinding.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

This page intentionally left blank.

3 | Global Recommendations

During the station site visits described in the previous chapter, the need for certain walk and bike improvements was observed repeatedly at each of the Focus Stations. Chapter 3 outlines ten improvements that are likely needed at all 17 Focus Stations, and presumably systemwide (see box below). Jurisdictions with BART stations are encouraged to consider the need for each of the following "Global Recommendations" even if not specifically identified at a given Focus Station.

This chapter presents the Global Recommendations, with the following caveats:

- **Focus stations**: In most cases, global recommendations were not called out individually in the station-specific improvements recommended in Chapter 2; however, jurisdictions with BART stations are encouraged to consider the need for each of these improvements, even if they're not specifically recommended at a given station.
- **Remaining stations:** Independent site visits are needed at BART's other stations to confirm that these improvements are indeed needed at each station.
- **Multimodal Access Design Guidelines:** In 2017, BART adopted the Multimodal Access Design Guidelines (MADG), which apply to BART property and connecting intersections. They are recommended for use by local jurisdictions "to support street design efforts around station areas to promote non-driving modes to and from the BART station." To avoid redundancies, this chapter provides references to the corresponding MADG sections. Global recommendations from this study that the MADG does not currently include can be added to the Guidelines when they are updated.

GLOBAL RECOMMENDATIONS

1. **Vision Zero:** Adopt Vision Zero policies, which strive to eliminate all traffic fatalities and severe injury collisions, particularly involving people walking and biking.
2. **Traffic Signals:** Update traffic signals to protect people walking and biking using the following capabilities:
   - **Pedestrian Countdown Signals:** Show how many seconds pedestrians have left to cross the street.
   - **Pedestrian Clearance Time:** Set the amount of time allowed to cross a street on foot to at most 3.5 feet/second.
   - **Leading Pedestrian Interval (LPI):** Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.
   - **Automatic Pedestrian Recall:** Routinely activate a pedestrian signal phase during the corresponding vehicle phase.
   - **Protected Left Turns:** During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.
   - **Accessible Pedestrian Signals (APS):** Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.
   - **Pedestrian Push Button Placement:** Locate push buttons for intuitive and convenient actuation.
   - **Bicycle Detection:** Adjust signal detectors to respond to the presence of bicycles.
3. **High-Visibility Crosswalks:** Paint high-visibility crosswalk stripes parallel to the direction of traffic.
4. **Directional Curb Ramps:** Construct two ramps at each street corner; one leading directly into each crosswalk.
5. **Pedestrian-Scale Lighting:** Install lights that shine directly onto the areas where people walk, both on and leading to BART property.
6. **Context-Sensitive Bikeways:** Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.
7. **Station Area Wayfinding:** Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.
8. **Walk & Bike Routes through BART Parking Lots:** Where feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.
9. **"Daylight" Intersections:** Clear space on crosswalk approaches to enable road-users to see pedestrians.
10. **Complete Streets Training for Engineers & Planners:** Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

Jurisdictions are encouraged to consider the need for each of these improvements, even if not specifically recommended at a given station.

- **Station Experience Design Guidelines:** In 2017, BART developed another set of guidelines – the Station Experience Design Guidelines (SEDG). SEDG aims to create a positive and cohesive passenger experience for all types of users along their entire journey on BART property, from station approach to the platform. The guidelines provide specific direction on how to design and locate customer amenities and visual media at stations, such as wayfinding and maps.

Vision Zero graphic showing that, as vehicle speeds increase, collisions with pedestrians become more deadly.

3.1 | Vision Zero

Local jurisdictions with BART stations should adopt Vision Zero policies and use them to develop station area street designs that prioritize safe access to transit for the most vulnerable road users: people accessing the station on foot and by bike.

Vision Zero is a data-driven initiative to eliminate all traffic fatalities and severe injury collisions. Vision Zero considers traffic deaths and injuries preventable. Vision Zero policies are typically adopted by municipalities to motivate change in their roadway design and operating policies. Cities that have BART stations and Vision Zero programs include Oakland, Berkeley, San Francisco, Fremont and San Jose.

Vision Zero programs track fatality data, the majority of which involves pedestrians, and prioritize safer facility designs for these road users, particularly in areas where they cluster, such as on access routes to BART stations.

Measures that help accomplish Vision Zero goals include:

- **Reducing vehicle speeds** by designing narrower roads with frequently spaced traffic signal-controlled high-visibility crosswalks,
- **Slowing vehicular turns** using tighter curb radii to increase visibility between drivers and pedestrians,
- **Providing pedestrian refuge areas** in the medians or extended curbs of wide streets,
- **Timing crossing times** at walking speeds that suit the most vulnerable pedestrians (older adults), and
- **Providing buffers and separated facilities** for cyclists, scooters, and other new modes of mobility.

Many BART riders access stations on foot and by bike, but safer accommodations are needed for the number of these trips to grow. BART should encourage local jurisdictions that have not yet adopted Vision Zero policies to establish them, particularly in the BART station vicinity.

3.2 | Traffic Signals

Update traffic signals to protect people walking and bicycling.

Traffic signals control the movement of people on foot, on bikes and in motor vehicles through intersections. The design and operation of traffic signals, from the placement of poles and signal heads to the priority and timing of various phases, affects user safety and communicates user priority. There are a number of aspects of traffic signal design and operations that need improvement near all Focus Stations. For the most part, BART's Multimodal Access Design Guidelines (MADG) do not address traffic signals, presumably because BART does not own or operate any. Therefore, these recommendations would fall to local agencies to implement, and should be considered for all traffic signals adjacent to BART stations at a minimum, and in the station vicinity along primary walk and bike station access routes.

3.2.1 Pedestrian Countdown Signals: Show how many seconds pedestrians have left to cross the street.

Pedestrian countdown signals provide a visible indicator that pedestrians have a designated crossing phase and show how many seconds they have left to cross the street. They are effective at reducing instances of pedestrians entering the intersection late in the crossing phase and being stuck in the street when the light changes and cross-traffic starts to move. Countdown indicators are required for all new traffic signals that have pedestrian indicators. All traffic signals in BART station areas should be outfitted with countdown displays. Some older traffic signals may need signal controller equipment upgrades to accommodate pedestrian countdown signals. Whether or not a walk signal includes a countdown indication, state guidance calls for allowing for at most 3.5 feet per second for pedestrians to cross, more time in areas where senior citizens, people with disabilities or small children frequently cross.

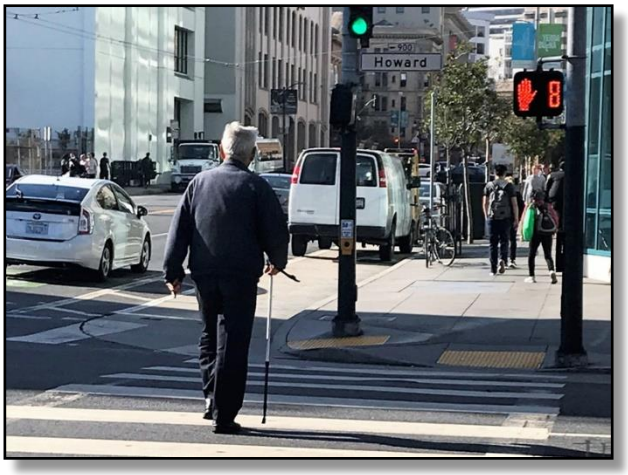
Pedestrian countdown signal

—Federal Highway Administration (FHWA), Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE 2013), August 2013

3.2.2 Pedestrian Clearance Time: Set the amount of time allowed to cross a street on foot to at most 3.5 feet per second.

The signal time programmed for pedestrians to cross any street – called the clearance interval – is required in California to be timed for a walk speed of at most 3.5 feet per second. Given that senior citizens and people with disabilities are more commonly transit-dependent than the general population, traffic signals near BART stations should be programmed to allow pedestrian clearance at a walk speed of 2.8 feet per second.

—Caltrans Traffic Signal Operations Manual, App. C (2017)



Pedestrian countdown signal showing pedestrian clearance time

3.2.3 Leading Pedestrian Interval (LPI): Provide traffic signal phasing that permits pedestrians to begin crossing an intersection several seconds before the parallel vehicle phase.

A Leading Pedestrian Interval (LPI) typically gives pedestrians permission to cross the street 3–7 seconds before vehicles, thus giving pedestrians a head start over vehicles turning at intersections and reducing conflicts. LPIs enhance the visibility of pedestrians in the intersection and reinforce their right-of-way, especially in locations with a history of turning conflicts. LPIs can be deployed in combination with No Right Turn on Red restrictions (see Chapter 4, Recommendation 4.6).

—California Manual on Uniform Traffic Control Devices (CA MUTCD) 2014 Revision 3, Section 4E.06-19; Caltrans Traffic Signal Operations Manual, Appendix C (2017)

3.2.4 Automatic Pedestrian Recall: Routinely activates pedestrian signal phase during the corresponding vehicle phase.

In locations of high pedestrian demand, and at minimum during peak commute periods, a signal phase that automatically permits and allows sufficient time for pedestrians to cross (also known as a "pedestrian signal phase") should be automatically activated during the corresponding vehicle phase, without the need to actuate the pedestrian phase by pushing a button. Another advantage of automatic recall is that the phase timing increased to accommodate pedestrians crossing safely allows for more time for bicyclists to cross as well.

In some cases, buttons are present that never call a signal, either because they are a legacy from a time when the buttons were operational or because the button's function is limited to activating audio crossing instructions for pedestrians with visual impairments. Legacy push buttons should be covered or removed; a sign indicating that a push button is there to provide audio instructions only should affixed as appropriate.

—CA MUTCD 2014 Revision 3 & FHWA Traffic Signal Timing Manual, 2nd edition

3.2.5 Protected Left Turns: During the pedestrian phase at intersections, prevent vehicles from turning left to avoid conflicts with people crossing the street.

Where pedestrian crossing volumes are high, left turns are permitted and turning volumes are relatively high, a protected left turn phase should be created so that motor vehicles never conflict with pedestrians crossing the street.

—Federal Highway Administration (FHWA) Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE 2013), August 2013. "Left Turn Phasing" http://pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=51

Traffic signals with Leading Pedestrian Interval

3.2.6 Accessible Pedestrian Signals (APS): Install APS to transmit information to visually-impaired pedestrians with audible signals and vibration.

Accessible pedestrian signal

In addition to communicating the pedestrian interval using lit WALK or DON'T WALK signs or countdown signals (see above), APS transmits information to visually-impaired pedestrians with audible signals and vibration. All traffic signals in BART station areas should have these capabilities.

—CA MUTCD 2014 Revision 3, Section 4E.09

3.2.7 Pedestrian Push Button (PPB) Placement: Locate push buttons for intuitive and convenient actuation.

When pressed, PPBs communicate to traffic signal controllers that a pedestrian wishes to cross. PPBs are located at signals without automatic pedestrian recall (see above) and/or to activate an audible signal for pedestrians with visual impairments. PPBs must be mounted between 3.5 and four feet above the sidewalk. They should be located near each end of the crosswalk in an unobstructed place, adjacent to a level, all-weather surface to provide access from a wheelchair. PPBs should be 1.5 to six feet from the edge of the curb, shoulder or pavement. The face of the pushbutton should be parallel to the crosswalk to be used.

—CA MUTCD 2014 Revision 3, Section 4E.08

3.2.8 Bicycle Detection: Adjust signal detectors to respond to the presence of bicycles.

Actuated traffic signals dynamically adjust the signal phase in response to the presence of vehicles. Actuation can occur with inductive loops embedded in the pavement or video cameras. Most signals do not indicate to drivers or bicyclists whether a green phase is called in this way or the alternative, based on timed phases. Without this information, when the traffic signal does not provide a crossing phase in a timely manner, people on bikes sometimes cross against the red light. Cities can prevent this situation by increasing the signal loops' sensitivity; adjusting video detectors to recognize bicycles; marking the most sensitive spot on the pavement (typically with a small bike symbol) adding a sign indicating bicycle detection; or by installing additional detectors in the bike lane. (R10-22 "To request green wait on <BICYCLE DETECTION SYMBOL>").

Bicycle detection indicator

Example of good PPB placement

—Federal Highway Administration (FHWA) Bicycle Safety Guide and Countermeasure Selection System (BIKESAFE 2014), September 2014. "Bike-Activated Signal Detection" www.pedbikesafe.org/bikesafe/countermeasures_detail.cfm?CM_NUM=36

3.3 | High-Visibility Crosswalks

Paint high-visibility crosswalk markings, which place traffic stripes parallel to the direction of traffic.

High-visibility crosswalk markings use retroreflective white thermoplastic, and come in different designs. The most common are continental, ladder and triple-four. Continental striping features wide stripes parallel to the direction of vehicular traffic. Ladder markings enhance the continental striping with transverse lines that bracket the striping. Triple-four markings are a variation of continental, which add a gap in the center to aid visually-impaired pedestrians (see photos at left).

In combination with warning signs, high-visibility crosswalk markings alert drivers to the presence of pedestrians by creating a greater visual contrast for oncoming drivers compared to conventional crosswalk markings, which are typically parallel stripes running perpendicular to vehicular traffic and may not be sufficiently wide or retroreflective. Consistent with BART's Multimodal Access Design Guidelines (MADG) code 1.37, high-visibility crosswalk markings are recommended, especially at uncontrolled crossings, because they are more visible to approaching vehicles and have been shown to improve yielding behavior.

High-visibility crosswalks should be adopted as a standard, to be implemented through routine maintenance or capital projects.

Continental high-visibility crosswalk striping

Triple-four high-visibility crosswalk striping

3.4 | Directional Curb Ramps

Construct two ramps at each street corner; one leading directly into each crosswalk, consistent with current Americans with Disabilities Act (ADA) guidelines.

Curb ramps are inclines between the roadway surface and the sidewalk, typically six to 10 inches above roadway grade. Curb ramps facilitate the smooth transition from sidewalk to roadway and are necessary to allow people with disabilities to access crosswalks and walk from block to block.

In the past, BART and cities have often installed "diagonal ramps," one ramp per corner, aimed at the center of the intersection. Depending on the crosswalk configuration and slope, diagonal ramps can channel wheelchair users into the middle of the intersection instead of the crosswalk, thus requiring users to change

Directional curb ramps

directions while in the roadway in order to reach the crosswalk, increasing their exposure to collisions with motor vehicles. To avoid this unsafe situation, current Americans with Disabilities Act (ADA) guidelines recommend "directional curb ramps," two ramps at each corner; one leading directly into each crosswalk. BART and local jurisdictions should consider making this potentially costly alteration when nearby construction is planned, particularly in areas known to be frequented by passengers who use wheelchairs or other mobility devices.

3.5 | Pedestrian-Scale Lighting

Install lights that shine directly on the areas where people walk, both on and leading to BART property.

Lighting oriented to people walking helps keep customers who access BART on foot safe from collisions with motor vehicles and bicycles, improve the perception of personal security and, in some cases, reduce crime. This is particularly important at intersections and in isolated areas with less foot and motor vehicle traffic. Pedestrian-oriented lights shine directly on the area where people walk, rather than relying on ambient light from roadway lighting. When designing pedestrian-scale lighting, a number of factors must be considered, including achieving adequate levels (in lumens), location, and minimizing the contrast between light and dark areas. Some jurisdictions (e.g., Lafayette) request reduced light levels because neighbors complain that parking lots are too bright.

- **Pedestrian-scale lighting on BART property:** This lighting is important between all station entrances that customers access on foot and the fare gates, including through BART parking lots, on sidewalks and at crosswalks.
- **Pedestrian-scale lighting outside of BART property:** Cities should provide pedestrian-scale lighting on the sidewalks and at crosswalks along the periphery of BART stations, as well as along pedestrian routes to and from stations.

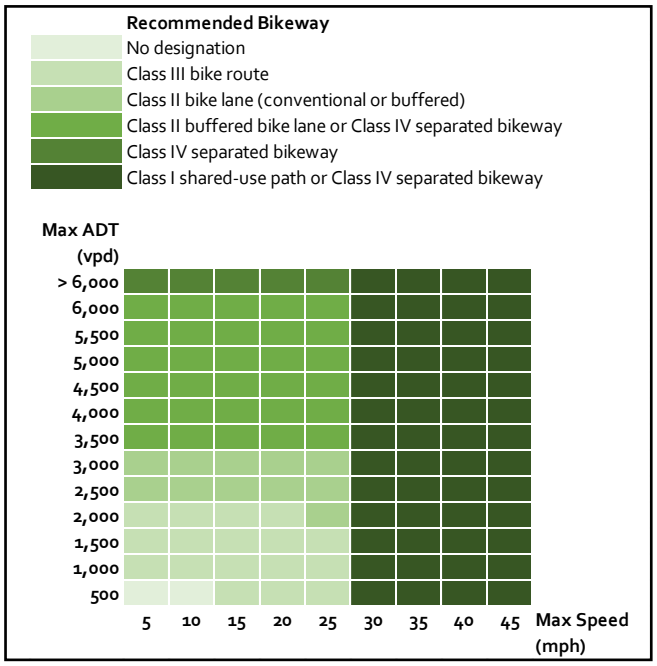
Pedestrian-scale lighting

3.6 | Context-Sensitive Bikeways

Install bikeways that are safe and appropriate for the speed and volume of adjacent traffic.

The type or "class" of bikeway in a given location must match the context in which it is located in order to create a low-stress bicycle network for users of all ages and abilities. The National Association of City Transportation Officials (NACTO) has developed guidance on how to best accommodate bicyclists on streets of different speeds and volumes, summarized in the table below. These recommendations go beyond the minimum requirements of FHWA's Manual on Uniform Traffic Control Devices (MUTCD) and consider user comfort as well as risk. They are a starting point for assessing design options and are not

intended to be prescriptive. Further guidance is available from NACTO on how to integrate various bikeway types into existing streetscapes, including potentially different infrastructure treatments for mid-block and intersection locations.



NACTO recommended bikeway class based on adjacent vehicle volumes & speeds

3.7 | Station Area Wayfinding

Erect signage at and leading to stations that indicates the best walk and bike routes to fare gates, bike parking and common destinations near each station.

There are opportunities at all Focus Stations for BART and local agencies to improve signage to indicate the best routes/ pathways for passengers on foot and bike, indicate entrances to BART property, and directions to fare gates, bike parking, and common destinations near each station. Building on BART's ongoing efforts to update station signage, this work should begin with the development of a standardized BART wayfinding design that can be applied on BART property, and be shared with local jurisdictions for inclusion on local signs leading to and from BART stations. Because BART's jurisdiction ends at its boundaries, the approach to wayfinding on and outside BART property differ:

Wayfinding outside of BART property: The following sign types outside of BART property would help people who walk and bike to BART and encourage those who drive to consider other access modes. Although cities have their own sign standards, a consistent BART "brand" used Bay Area-wide would help communicate this message.

Station area wayfinding sign

- **To stations:** Directional signs that show the most direct walking and biking routes will help BART riders who already use these access modes and suggest to others that they're viable options.
- **To nearby destinations:** Wayfinding signs on station property can help customers begin a walk or bike ride, but these signs must continue outside the station to be useful.
- **Maps:** Maps posted at BART stations and on BART's website can be improved by being to scale; by including bike routes and accessible pathways with links to online bus and shuttle transit maps; and by including them in the official BART mobile app.
- **Opportunities to implement:** Beyond a station's or a city's stand-alone wayfinding efforts, other opportunities to update wayfinding, including signs and maps, are:
  - MTC's current efforts to coordinate with the cities of San Francisco, Oakland and San Jose to develop a new regional map standard;
  - BART partnerships with local entities; and
  - Requirements of new transit-oriented development

Wayfinding on BART property: The following sign types on BART property would help people who currently walk and bike to BART and encourage those who drive to consider other access modes. A consistent design and policy for placement would reinforce the importance the District places on these modes.[29]

- **At walk entrances to BART property:** Prominent BART identification signs are posted at many station driveways, but they are missing from portals used exclusively by people walking and biking (e.g., El Cerrito Plaza, Ashby). Signs are needed at such locations because these routes are often the most direct routes to the fare gates (although they often require walking and biking through BART parking lots; see recommendation 3.8).
- **To bicycle parking:** To encourage passengers who arrive at stations by bicycle to park rather than bring their bike aboard a train, there should be directional signs to and prominent signs marking the location of BART's bike parking. This includes groupings of bike racks within and near the fare gates, on-demand bike lockers, bike stations and bike share stations.
- **To nearby destinations:** Area maps should indicate walking and biking routes, and wayfinding signs should be installed to show which station entrances most directly lead to common destinations within walking and biking distance of each station.

Station area wayfinding sign

3.8 | Walk & Bike Routes through BART Parking Lots

Where technically feasible, restripe BART parking lots to provide direct walk and bike routes between the entrances passengers on foot and bikes use, fare gates, and bike parking.

Many BART riders who walk and bike to stations that have automobile parking must traverse parking lots to reach bike parking and the fare gates. While some lots provide good pedestrian facilities along the most direct routes between lot entrances and fare gates (e.g., Concord's Park Street entrance), most do not. Where technically feasible, BART should consider restriping or redesigning its parking lots to provide direct routes between the entrances to BART property that passengers on foot and bikes use and the fare gates and bike parking. This could take place along the parking lot periphery or between the parking aisles.

BART should consider the following when determining where to invest in parking lot adjustments to better guide people walking and biking:

- Existing desire lines (i.e., the routes BART riders currently take through parking lots);
- Safety considerations, traffic conflicts and lighting;
- New wayfinding; and
- High number of expected pedestrians and bicyclists, for instance, as a result of nearby development.

Note: Parking layouts were originally designed to maximize the number of cars that could be stored. Drainage and lighting were planned accordingly. Restriping these lots to provide walk and bike access lanes may lead to the need for costly reconstruction and/or utility relocation for the following reasons:

- To ensure that rainwater drains properly
- To avoid creating inadvertent dark areas;
- Changing more than 2,500 square feet may trigger the need for a new state stormwater permit;

[29] BART is embarking upon a project to develop comprehensive signage design standards for multimodal station access facilities between station fare gates and BART's property lines.

- New routes would need to conform to ADA standards that stipulate the steepest a wheelchair-accessible route can be in terms of its running- and cross-slopes; and
- The original vehicle circulation aisles were built with more durable pavement than parking stalls; relocating the aisles may put moving vehicles on pavement that was not built to accommodate them, resulting in premature pavement failure.

3.9 | "Daylight" Intersections

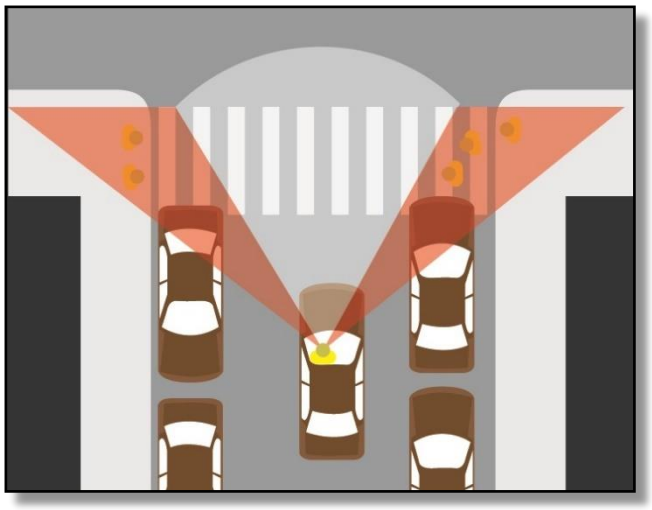
Clear curb space on crosswalk approaches to enable road-users to see pedestrians.

Prohibiting automobile parking adjacent to crosswalks – called "daylighting" – improves pedestrian safety by removing obstacles that prevent drivers and crossing pedestrians from seeing each other. Daylighting can be a good option where corner bulb-outs are too costly or interfere with bike lanes, particularly at unsignalized intersections, and at locations where compliance with stop controls is low. Daylighting requires prohibiting on-street parking on the crosswalk approach with a red curb; vertical delineator posts, a bike corral or low landscaping can also be used.

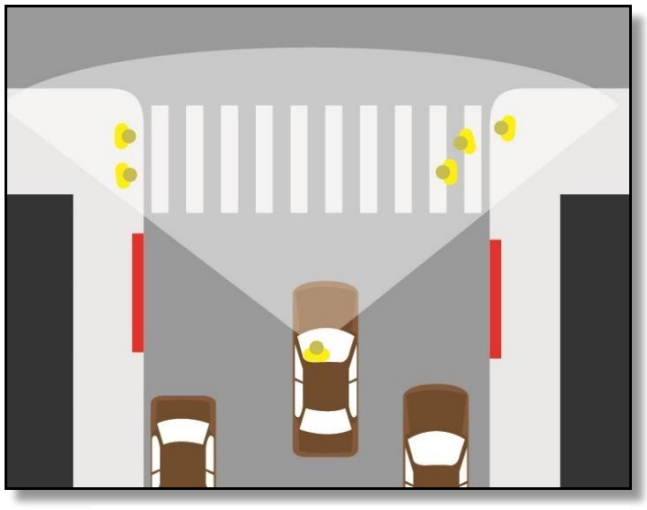
3.10 | Complete Streets Training for Engineers & Planners

Train engineers and planners at BART and at cities with BART stations on complete streets planning and engineering concepts.

The people responsible for planning and designing roadway, bikeway, sidewalk and pathway facilities at cities with BART stations would benefit from exposure to complete streets planning and engineering concepts. This could include complete streets trainings offered by MTC and UC Berkeley's Technology Transfer, as well as memberships to the National Association of City Transportation Officials (NACTO), which hosts conferences, publishes design guides and otherwise brings transportation professionals together to share best practices, particularly as they relate to walking and biking. BART staff who are reviewing plans (on and off BART property) and are otherwise involved with designing facilities need training too. This includes engineers working on station modernization, engineering and maintenance projects and BART Real Estate (TOD) staff. Beyond training their own planners and engineers, BART can incentivize local governments to train their staff by giving preference in the new Safe Routes to BART (SR2B) program[30], giving extra points for cities whose staff has been trained.



Intersection where parked cars can block motorists' view of pedestrians



Daylit intersection, with on-street parking removed

[30] Safe Routes to BART is a component of the Measure RR bond and is geared toward filling funding gaps in active transportation station access projects.

4 | Toolkit for station-specific recommendations

The previous chapter discussed Global Recommendations to be considered at all stations, based on site visits to the 17 Focus Stations. This chapter provides a toolkit to help understand and implement the treatments recommended in Chapter 2 at specific Focus Stations (see box at right). Each is supported by a discussion of its application, photographs of examples and references for further research. The treatments in this toolkit, along with the Global Recommendations in Chapter 3, should be considered to improve walking and biking conditions around all BART stations.

Station-Specific Recommendations

1. Advance Stop and Yield Lines
2. Bike Boxes
3. Bike Stairway Channels
4. Driveway Crossing Treatments
5. Median Refuge Islands
6. No Right Turn on Red Signs
7. Pedestrian Hybrid Beacons
8. Pedestrian Warning Signs
9. Pedestrian-Only Signal Phasing
10. Protected Intersections
11. Railroad Crossing Treatments
12. Raised Intersections
13. Rectangular Rapid Flashing Beacons (RRFBs)
14. Reduce Turning Speeds
15. Reverse Angle Parking
16. Road Diets
17. Shared Passageways
18. Thermoplastic Striping on Decorative Crosswalks

4.1 | Advance Stop and Yield Lines

Issue

Motorists often encroach on marked crosswalks rather than stopping in advance of the crosswalk, presenting a safety and comfort issue for pedestrians.

Solution / Benefit

Advance stop and advance yield lines serve as visual cues to motorists to stop or yield in advance of the crosswalk. Advance stop lines or bars – 12 to 24-inch wide white lines – may be installed at signalized and unsignalized intersections and mid-block crosswalks. Yield lines – 12 to 24-inch wide triangles – are similarly installed at crossings where there is no stop control. Both types should be placed eight to 40 feet in advance of the crossing, perpendicular to the travel lane. At signalized approaches, a bike box may be placed between the crosswalk and stop line (see Recommendation 4.2).

Design / Cost / Implementation Considerations

Low cost: Install using paint or thermoplastic pavement markings.

High cost: Grind out and relocate existing line, if needed.

References

National Association of City Transportation Officials (NACTO), *Urban Street Design Guide*

Federal Highway Administration (FHWA), *CA-MUTCD – Section 3B.16*

4.2 | Bike Boxes

Issue

People on bikes can feel unsafe waiting at signalized intersections that lack a dedicated bicycle waiting area. Drivers preparing for a right turn may overlook people on bikes waiting to their right.

Solution / Benefit

A bike box is a marked area of the intersection at the head of a traffic lane that provides bicyclists a route to bypass stopped traffic at traffic signals, position themselves to make left turns, and receive a head start during the green phase. Bike boxes are usually located at intersections with high bicycle volumes or where there may be conflicts between bicyclists and right- or left-turning vehicles.

Design / Cost / Implementation Considerations

Low cost: Grind out existing striping, or slurry seal and stripe the new bike box.

High cost: Reconfigure intersection lane geometry, adjust signal detectors, repair pavement.

References

National Association of City Transportation Officials (NACTO), *Urban Street Design Guide*

4.3 | Bike Stairway Channels

Issue

Stairways are often a barrier for bicyclist access, particularly for those unable to pick up and carry their bikes up and down stairs.

Solution / Benefit

Bike channels are mini-ramps installed on stairways that allow cyclists to roll their bicycles up and down stairways as an alternative to carrying them.

Design / Cost / Implementation Considerations

Low cost: Cut prefabricated metal channels to desired length and install.

High cost: Fabricate custom-made channels and install; design to be integrated into new staircases.

References

BART Bicycle Program Capital Plan, June 2017

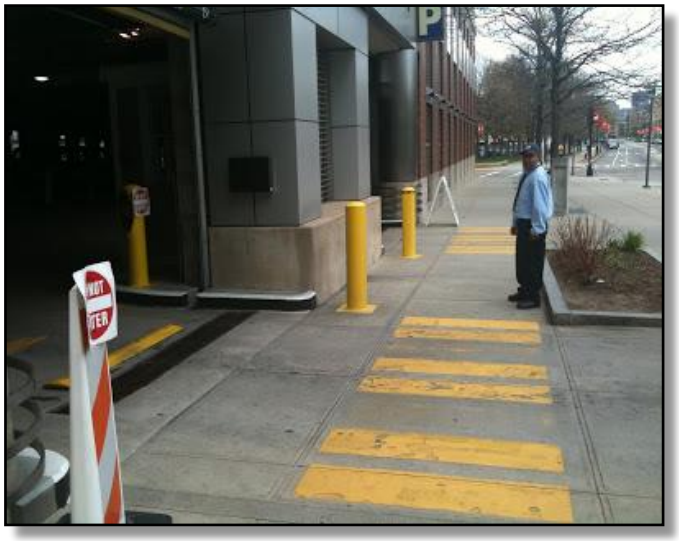
4.4 | Driveway Crossing Treatments

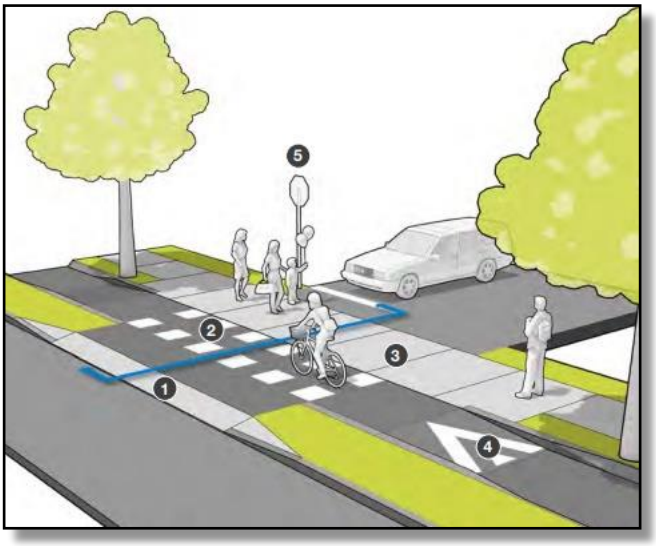
Issue

Commercial driveways are rarely designed in a way that alerts motorists to the potential presence of people walking or biking across them. In addition, driveways built before the passage of the Americans with Disabilities Act are sometimes sloped at the crossing.

Solution / Benefit

Installing stop signs for vehicles at driveway exits and marking the sidewalk and bike lane mixing zone indicate to motorists to look for pedestrians and cyclists before proceeding across the sidewalk. Providing a level sidewalk satisfies ADA's maximum cross-slope requirements.





Design / Cost / Implementation Considerations

Low cost: Install stop signs at exits, sidewalk markings at crossings, and mixing zone markings in bike lanes.

High cost: Level sidewalk and/or bikeway crossings, consolidate and shorten driveways.

References

Massachusetts DOT, Separated Bike Lane Planning & Design Guide, 2015

4.5 | Median Refuge Islands

Issue

Failure to provide median refuges on longer pedestrian crossings exposes slower pedestrians to conflicts with vehicles.

Solution / Benefit

A median refuge island provides a protected space for pedestrians and cyclists to wait between crossings of opposing directions of traffic, allowing them to find gaps in one direction of traffic at a time while standing on or alongside a raised curb or other raised feature. Median refuge islands are generally used at locations where speeds and volumes make crossing both directions of traffic at once difficult or where multiple lanes of traffic make pedestrians and cyclists feel exposed or unsafe in the intersection.

Design / Cost / Implementation Considerations

Low cost: Construct island within existing intersection geometry.

High cost: Construct island by encroaching into vehicle lane and/or modifying signal equipment.

References

National Association of City Transportation Officials (NACTO), *Urban Street Design Guide*

4.6 | No Right Turn on Red (RTOR) Sign

Issue

At intersections without RTOR restrictions, right-turning motorists commonly pull into the crosswalk to wait for a gap in cross traffic, blocking sightlines and pedestrian crossing movements. Often, the motorists do not come to a full stop and are focused on traffic to their left, endangering pedestrians in the crosswalk to their right.

Solution / Benefit

No RTOR signs should be deployed on approaches where there is a history of right-turning vehicle-pedestrian/ bicycle crashes, where there are exclusive pedestrian or bicycle facility signal phases, or where there are high pedestrian/ bicyclist volumes. Traditional static No RTOR signs are in effect at all times unless otherwise indicated with day and time. Dynamic No RTOR signs, which use highly visible LED lights can be programmed to illuminate when pedestrians are crossing.

Design / Cost / Implementation Considerations

Low cost: Install static (non-illuminated) No ROTR sign on existing or new sign post.

High cost: Install illuminated blank-out No ROTR sign. (Blank-out signs are illuminated signs that show a blank black panel when inactive.)

References

Federal Highway Administration, *Pedestrian Safety Guide and Countermeasure Selection System*, August 2013

4.7 | Pedestrian Hybrid Beacons

Issue

It is difficult and sometimes unsafe for pedestrians to cross unsignalized intersections on roadways with high motor vehicle speeds or volumes.

Solution / Benefit

Pedestrian hybrid beacons (PHBs) are used to make non-signalized crossings of major streets safer in locations where side-street volumes do not warrant installation of a conventional traffic signal. PHBs consist of two red lenses above a single yellow lens. The lenses remain "dark" until a pedestrian pushes the call button to activate the beacon. The signal initiates a yellow-to-red lighting sequence consisting of steady and flashing lights that direct motorists to slow and come to a stop. The pedestrian signal then flashes a WALK display to the pedestrian. Once the pedestrian has safely crossed, the hybrid beacon returns to dark.

Design / Cost / Implementation Considerations

Low cost: N/A

High cost: Erect new mast arm, pole, beacons, and signs.

References

Federal Highway Administration (FHWA), *Pedestrian Safety Guide and Countermeasure Selection System*, 2013

4.8 | Pedestrian Warning Signs

Issue

Pedestrians are not adequately visible to motorists at some unsignalized crossings and can therefore be more vulnerable to vehicle-pedestrian crashes.

Solution / Benefit

Pedestrian warning signs can be used to alert road users in advance of crosswalks at uncontrolled intersections or midblock locations. Where pedestrian warning signs are posted at crosswalks, a diagonal downward pointing arrow plaque must be mounted below the sign to indicate the crossing location.

Design / Cost / Implementation Considerations

Low cost: Install new pole and signs at existing crosswalks.

High cost: Rectangular Rapid Flashing Beacons with new high visibility crosswalks (see Recommendation 4.7).

References

California Department of Transportation (Caltrans), California Manual on Uniform Traffic Control Devices (CA MUTCD) 2014, Section 2C.50 Non-Vehicular Signs

4.9 | Pedestrian-Only Signal Phasing

Issue

There are many opportunities for conflicts between turning vehicles and pedestrians at signalized intersections with high pedestrian volumes and high vehicle turning movements.

Solution / Benefit

Pedestrian-only signal phasing, also known as a pedestrian "scramble," stops all vehicular movement and allows pedestrians to cross in any direction, including diagonally, without encountering a motor vehicle. Pedestrian-only phases should be applied in areas with consistently high pedestrian volumes throughout the day (more than 1,000 pedestrians per hour).

Design / Cost / Implementation Considerations

Low cost: Restripe crosswalks and retime signal phasing.

High cost: Restripe crosswalks (including artistic treatments), retime signal phasing, install new pedestrian signal heads and upgrade signal equipment.

References

Pedestrian and Bicycle Information Center, Exclusive Pedestrian Phasing

California Department of Transportation (Caltrans), California Manual on Uniform Traffic Control Devices (CA MUTCD) 2014, Section 3B.18

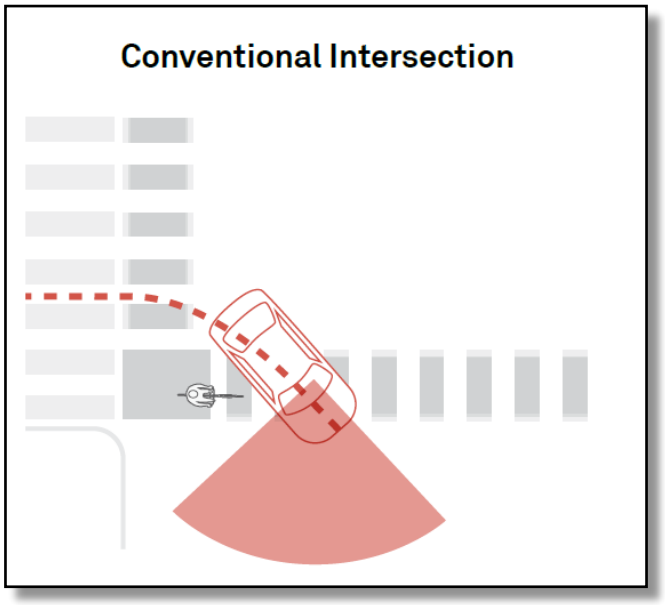
4.10 | Protected Intersections

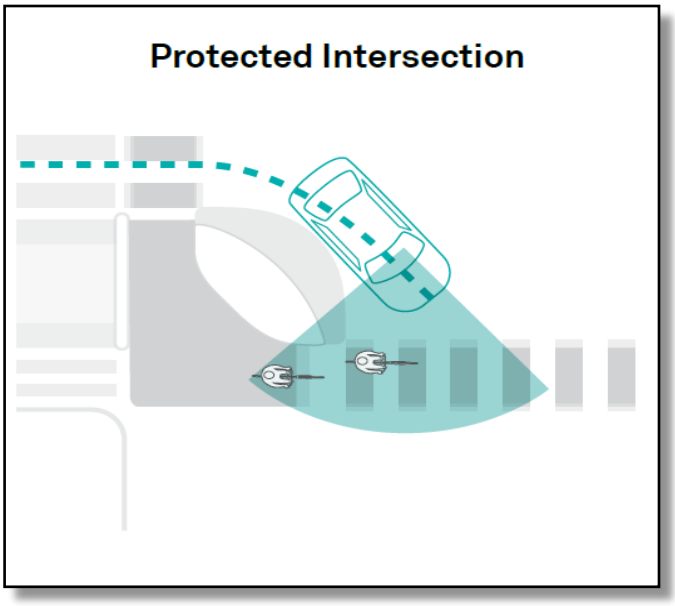
Issue

High speed, right turning vehicles can create an uncomfortable environment for pedestrians. Bicyclists can also be vulnerable to turning motor vehicles where they share the roadway.

Solution / Benefit

Protected intersections reduce turning radii with physical barriers, which slows turning traffic. They offer a less costly alternative to curb reconstruction and can be designed to accommodate emergency vehicles.





Design / Cost / Implementation Considerations

Low cost: Paint, install horizontal and vertical delineators.

High cost: Install full curbs and thermoplastic markings.

References

NACTO, Don't Give Up at the Intersection, May 2019

4.11 | Railroad Crossing Treatments

Issue

At-grade railroad crossings often have no or inadequate treatments for bicyclists and pedestrians, putting these travelers at risk of conflict with moving trains and/or the railroad tracks themselves.

Solution / Benefit

Marking bicycle crossings of railroad tracks at a 90-degree angle is essential to minimize the risk of getting wheels caught in the flangeway. Additional treatments include flangeway filler to reduce gaps or making tracks flush with the roadway grade.

Treatments to protect pedestrians from conflicts with moving trains include using fencing to channelize them to a single, controllable crossing location with automated swing gates, flashers, audible active warning devices and variable message signs.

Design / Cost / Implementation Considerations

Low cost: Mark pavement, install flashers and bells timed for pedestrian access, flangeway filler and signs.

High cost: Install fencing for channelization, automated gates and dynamic signs.

References

FHWA, Pedestrian Safety at Railroad Crossings

FHWA, Railroad-Highway Grade Crossing Handbook, 3rd Edition, July 2019

4.12 | Raised Intersections

Issue

People are vulnerable walking and biking through intersections on high-speed roadways and on those with a history of pedestrian- or bicycle-involved collisions or other conflicts. Traffic signals on these streets may not be warranted or desired for other reasons.

Solution / Benefit

Raised intersections elevate the roadway to the level of the sidewalk, roughly six inches. They reduce vehicle speeds and increase visibility of crossing pedestrians and cyclists by motorists. Corner bollards prevent motor vehicles from encroaching onto the sidewalk.

Design / Cost / Implementation Considerations

Low cost: Construct using asphalt, pavement markings, bollards and tactile domes.

High cost: Construct using concrete, pavers or other distinctive treatments.

References

NACTO, Urban Street Design Guide

FHWA, Pedestrian Safety Guide and Countermeasure Selection System

4.13 | Rectangular Rapid Flashing Beacons (RRFBs)

Issue

Motorists sometimes don't see pedestrians, even when they are in high-visibility crosswalks.

Solution / Benefit

RRFBs use flashing LED lights to create a high-visibility strobe-like warning to drivers when pedestrians are in the crosswalk or bicyclists are crossing. They are typically installed at unsignalized intersections and mid-block crossings, in combination with pedestrian warning signs. Pedestrians or bicyclists wanting to cross the street actuate RRFBs by push-button or passive detection (i.e., microwave or infrared).

Design / Cost / Implementation Considerations

Low cost: Install new signs, poles and beacons with wireless and solar power connections.

High cost: Install new signs, poles and beacons with wired power connection and underground conduit.

References

California Department of Transportation (Caltrans), California Manual on Uniform Traffic Control Devices (CA MUTCD) 2014, Section 2C.50 Non-Vehicular Signs

4.14 | Reduce Turning Speeds

Issue

Fast-moving, right-turning vehicles can threaten pedestrians crossing the street and bicyclists continuing straight. Design factors that facilitate high turning speeds include channelized turn lanes (also known as slip lanes or pork chop islands) and large corner curb radii. Slip lanes also serve to widen intersections, thus creating longer pedestrian crossing distances and thus increased exposure to crashes with motor vehicles.

Solution / Benefit

Reducing corner curb radii can improve pedestrian safety by requiring motorists to slow down before making right turns, shortening pedestrian crossing distances and exposure time, and allowing for greater flexibility of curb ramp replacement. Channelized turn lanes should be eliminated wherever possible. In the short-term, they can be closed, with vehicles directed to make right turns in the traditional manner.

Design / Cost / Implementation Considerations

Low cost: Create temporary corner bulb-out with striping and delineators, install advance warning signs, relocate crosswalks to optimize visibility and upgrade to high-visibility designs.

High cost: Install raised crosswalks, pedestrian beacons and curb extensions/bulb-outs that require drainage modifications. Permanently close dedicated or channelized right turn lanes.

References

NACTO, Urban Street Design

O'Brien, Mark & O'Brien, Andrew & Liu, Jessie & Michaux, Giles & Nahlawi, Hani. (2012). Pedestrian Safety at Slip Lanes and Alternative Turn Lane Treatments. Transportation Research Record. 2299. 110-120. 10.3141/2299-12.

FHWA Pedestrian Safety Guide and Countermeasure Selection System, August 2013

4.15 | Reverse Angle Parking

Issue

Traditional front-in angled parking makes it difficult for motorists to see bicyclists and other vehicles when they are backing out.

Solution / Benefit

Diagonal parking spaces accessed by backing into them are known as "reverse-angle" parking spaces. This improves the line of sight between drivers, cyclists and pedestrians as vehicles exit a parking space and enter moving traffic. It is safer for cyclists by making it easier for exiting drivers to see bicyclists passing by. It is safer for children and passengers, with car doors opening to usher in the direction of the sidewalk, not traffic. It also results in trunk loading on the sidewalk instead of a travel lane. Both types of angled parking take up more space across the roadway than parallel parked vehicles, so both can help calm wide streets.

Design / Cost / Implementation Considerations

Low cost: Grind out or paint over existing striping and install new striping with signage and curb stops.

High cost: Reconfigure or install corner bulb-outs, in addition to low-cost changes.

References

NACTO, Urban Street Design Guide

O'Brien, Mark & O'Brien, Andrew & Liu, Jessie & Michaux, Giles & Nahlawi, Hani. (2012). Pedestrian Safety at Slip Lanes and Alternative Turn Lane Treatments. Transportation Research Record Journal of the Transportation Research Board. 2299. 110-120. 10.3141/2299-12.

4.16 | Road Diets

Issue

Traffic on wide multi-lane undivided roadways can be very fast-moving, contributing to high-crash frequencies, and creating an unsafe environment for the broad range of transportation modes that use them.

Solution / Benefit

Road diets typically improve safety for all users and reduce collisions. They narrow or eliminate some vehicle lanes to slow traffic speeds and create new space to add complete street improvements such as bike lanes, median refuge islands, and landscaping. Road diets can improve safety and comfort for pedestrians at intersections by reducing the number of lanes that need to be crossed and providing an opportunity to upgrade sub-standard crosswalks. Bicyclists also benefit from road diets when they result in reduced vehicular speeds and new or upgraded bikeways, such as Class II buffered bike lanes or Class IV separated bikeways.

Before and after a road diet

Design / Cost / Implementation Considerations

Low cost: Slurry seal, new lane-striping and other pavement markings.

High cost: Reconfigure roadway elements including pedestrian crossings, signal equipment and traffic signs, in addition to low-cost expenses.

References

Federal Highway Administration, Pedestrian Safety Guide and Countermeasure Selection System, August 2013

4.17 | Shared Passageways

Issue

Limited right-of-way in public driveways or other passageways that could otherwise provide safe walk and bike access to BART stations.

Solution / Benefit

Shared passageways prioritize access to the street for pedestrians and cyclists, but allow very low speed motor vehicle access, particularly for pick-up and delivery of goods. These facilities can be completely shared by all users or walkways can be designated, often at the same level as the street. Shared passageways are modeled after shared streets, also known as "woonerf." They are found in quiet residential areas, where the converted street can be used for play, and in commercial districts, where dining and other activities can take place.

Design / Cost / Implementation Considerations

Low cost: Pavement markings, signage, bollards.

High cost: Pavers or other distinctive treatments.

References

Pedestrian and Bicycle Information Center, Winthrop Street Shared Street in Cambridge, MA
NACTO, Urban Street Design Guide

4.18 | Thermoplastic Striping at Decorative Crosswalks

Issue

Pedestrians crossing in crosswalks made of brick, colored and other decorative treatments that do not incorporate standard retroreflective materials are not as visible to motorists as they are in standard, high-visibility crosswalks. Over time, brick crosswalks cause tripping hazards and increased maintenance costs.

Solution / Benefit

Brick or other non-standard non-reflective street materials should be avoided for use in crosswalks. To enhance existing decorative crosswalks' visibility to approaching vehicle drivers, additional high-visibility crosswalk markings should be applied on top of the decorative markings. In locations that do not require high-visibility markings, standard reflective crosswalk markings should be added at the crosswalk edges.

Design / Cost / Implementation Considerations

Low cost: Apply thermoplastic markings over decorative crosswalks.

High cost: Reconstruct decorative crosswalks using high-contrast materials and surface treatments.

References

National Association of City Transportation Officials (NACTO), *Urban Bikeway Design Guide*

This page intentionally left blank.

Image Credits

- 22-23, Castro Valley BART station, Jon Spangler
- 33, Clayton Road/Oakland Ave, Google Street View
- 43, El Cerrito Plaza bike lockers, City of El Cerrito
- 60, Vashell Way, WRT Planning + Design
- 76, Davis Street, Google Street View
- 89, BART Driveway, Google Street View
- 108, Vision Zero graphic, Active Transportation Alliance
- 110, LPI (both images), Federal Highway Administration (FHWA)
- 111, bike actuation, NACTO
- 111, PPB placement, www.pedbikeimages.org / Dan Burden
- 112, continental crosswalk (top), St. Louis Urban Review
- 112, triple four crosswalk (top), City of Berkeley / Eric Anderson
- 113, directional curb ramps, Google street view
- 114, bikeway class table, Arup using NACTO data
- 116, daylighting (both images), NACTO
- 118, advance stop lines (left), NACTO
- 118, advance yield lines (right), WalkFirst SF Planning
- 119, bike boxes (left), www.pedbikeimages.org / Toole Design Group
- 119, bike boxes (right), www.pedbikeimages.org / Laura Sandt
- 120, stairway channels (left), Wikipedia
- 120, stairway channels (right), Streetsblog.org
- 121, driveway crossings (left), Calm Streets Boston
- 121, driveway crossings (right), NACTO
- 122, median refuge islands (left), NACTO
- 124, pedestrian hybrid beacons (right), FHWA
- 125, pedestrian warning signs (left), FHWA
- 125, pedestrian warning signs (right), Rapid City (IA) Journal/Ryan Soderlin
- 126, pedestrian-only signal phasing (left), Streetsblog Chicago / John Greenfield
- 126, pedestrian-only signal phasing (right), Living Streets Alliance
- 127, protected intersections (both), NACTO
- 128, railroad crossing treatments (left), FHWA
- 128, railroad crossing treatments (right), NACTO Transit Street Design Guide
- 129, raised intersections (both), NACTO Urban Street Design Guide
- 130, RRFB (right), www.pedbikeimages.org / Lara Justine
- 131, reduce turning speeds (left), Smart Growth Online / John Greenfield
- 131, reduce turning speeds (center), www.pedbikeimages.org / Dan Burden
- 132, reverse angle parking (left), www.pedbikeimages.org / Dan Burden
- 132, reverse angle parking (right), SFMTA / Ben Jose
- 133, road diets (both), www.pedbikeimages.org / Alyson West
- 134, shared passageways (left), Hykolity
- 134, shared passageways (right), Michael Kodransky, EURIST e.V.
- 135, thermoplastic striping at decorative crosswalks (right), Wikidpedia Commons / Piotrus

All other images by BART staff or their consultants.