

**RESOLUTION NO. 9-23**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RICHMOND  
ADOPTING THE BICYCLE AND PEDESTRIAN ACTION PLAN**

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**WHEREAS**, the Metropolitan Transportation Commission (“MTC”) received a Caltrans Grant with Richmond as a sub-applicant to develop a Bicycle and Pedestrian Action Plan (the “BPAP”); and

**WHEREAS**, the BPAP contains recommendations that are designed to provide short-term infrastructure improvements with a focus on decreasing the risk of collisions for people walking, biking, rolling, and driving across Richmond; and

**WHEREAS**, the BPAP furthers implementation of General Plan 2030 *Goal CR1 – An Expanded Multimodal Circulation System; Goal CR2 – Walkable Neighborhoods and Complete Streets; Goal CR3 – A Safe and Well-Maintained Circulation System; Policy CR1.1 – Balanced Modes of Travel and Equitable Access; Policy CR1.2 – An Interconnected Street System; and Policy CR1.5 – Safe and Convenient Walking and Bicycling; and*

**WHEREAS**, the BPAP supports transportation objectives and strategies in the City’s adopted Climate Action Plan, including *Objective 3 – Sustainable Transportation and Land Use; Strategy TL2 – Complete Streets; and Strategy TL3 – Improve Bicycle and Pedestrian Infrastructure; and*

**WHEREAS**, the BPAP was developed with significant community input and engagement from area residents, neighborhood councils, stakeholder groups, and public agencies; and

**WHEREAS**, the improvements associated with the BPAP meet the requirements for a categorical exemption under Section 15301, Existing Facilities, with subsection (c) specifically covering alterations to existing highways and streets, sidewalk, gutters, bicycle and pedestrian trails, and similar facilities such as the addition of bicycle facilities, including, but not limited to bicycle parking, bicycle-share facilities and bicycle lanes, transit improvements such as bus lanes, pedestrian crossings, street trees, and other similar alterations that do not create additional automobile lanes, and Section 15304, Minor Alterations to Land - Class 4, with Subsection (h) specifically covering the creation of bicycle lanes on existing rights-of-way; and

**WHEREAS**, on October 25, 2022, a City Council study session on the draft BPAP was held and comments received, and on February 7, 2023, the City Council considered adoption of the BPAP.

**NOW, THEREFORE, BE IT RESOLVED** that the City Council does hereby find that the above recitals are true and correct and have served, together with the Agenda Report dated February 7, 2023, as the basis for the findings and actions set forth in this Resolution.

**NOW, THEREFORE, BE IT FURTHER RESOLVED** that the City Council does hereby: 1) adopt the Richmond Bicycle and Pedestrian Action Plan, which is incorporated herein as Exhibit A to this resolution; and 2) directs staff to: a) emphasize on pedestrian safety around schools; b) collaborate with Contra Costa County to ensure coordinated planning for seamless bicycle and pedestrian paths connecting and serving residents of Richmond, North Richmond and El Sobrante; and c) seek funding to expand bicycle and pedestrian connectivity with strong coordination with neighboring jurisdictions (including City of San Pablo, City of El Cerrito, and Contra Costa County) to provide facilities in areas that are served by streets that traverse multiple jurisdictions including areas like North Richmond and El Sobrante.

\*\*\*\*\*

I certify that the foregoing resolution was passed and adopted by the City Council of the City of Richmond at a regular meeting thereof held February 7, 2023, by the following vote:

AYES: Councilmembers Bana, Jimenez, Robinson, Willis, Zepeda,  
Vice Mayor McLaughlin, and Mayor Martinez.  
NOES: None.  
ABSTENTIONS: None.  
ABSENT: None.

PAMELA CHRISTIAN  
CLERK OF THE CITY OF RICHMOND  
(SEAL)

Approved:

EDUARDO MARTINEZ  
Mayor

Approved as to form:

DAVE ALESHIRE  
City Attorney

State of California            }  
County of Contra Costa        }       : ss.  
City of Richmond               }

I certify that the foregoing is a true copy of **Resolution No. 9-23**, finally passed and adopted by the City Council of the City of Richmond at a regular meeting held on February 7, 2023.

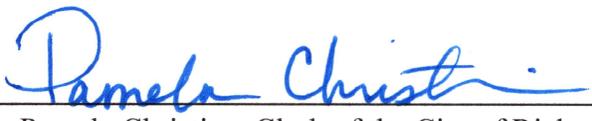
  
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Pamela Christian, Clerk of the City of Richmond

Exhibit A: Final BPAP



City of Richmond  
**Bicycle and Pedestrian  
Action Plan**

January 2023

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# Acknowledgments

Funding for the project was provided through a Caltrans Sustainable Transportation Planning Grant in partnership with the Metropolitan Transportation Commission (MTC) as part of the Vehicle Miles Traveled-Reduction Planning for Priority Development Areas project.

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# Acronyms

**ADA** – Americans with Disabilities Act

**ATP** – Active Transportation Program

**BAAQMD** – Bay Area Air Quality Management District

**BART** – Bay Area Rapid Transit

**BPAC** – Bicycle and Pedestrian Advisory Committee

**BPAP** – Bicycle and Pedestrian Action Plan

**CA DPR** – California Department of Parks and Recreation

**CA HCD** – California Department of Housing and Community Development

**CA MUTCD** – California Manual on Uniform Traffic Control Devices

**CA OTS** – California Office of Traffic Safety

**CALTRANS** – California Department of Transportation

**CBO** – Community Based Organization

**CBPP** – Countywide Bicycle and Pedestrian Plan

**CCTA** – Contra Costa Transportation Authority

**CIP** – Capital Improvement Project

**HSIP** – Highway Safety Improvement Program

**LRSP** – Local Road Safety Plan

**MPH** – Miles Per Hour

**MTC** – Metropolitan Transportation Commission

**OTS** – Office of Traffic Safety

**PHB** – Pedestrian Hybrid Beacon

**RAISE** – Rebuilding American Infrastructure with Sustainability and Equity Grant

**RNCC** – Richmond Neighborhood Coordinating Council

**RRFB** – Rectangular Rapid Flashing Beacon

**SRTCP** – South Richmond Transportation Connectivity Plan

**TIMS** – [University of California Berkeley] Transportation Injury Mapping System

**USDOT** – United States Department of Transportation

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# Executive Summary

In an effort to improve roadway safety for all users—people walking, biking, rolling, and driving—the City of Richmond created the Travel Safe Richmond initiative. There are two core elements that guide the initiative, the Local Road Safety Plan (LRSP) and the Bicycle and Pedestrian Action Plan (BPAP). The LRSP and BPAP work together to create unified policies and infrastructure recommendations for improving safety and comfort for roadway users of all ages and abilities. The LRSP, adopted in July 2022, identified traffic safety trends and developed recommendations to fund and implement infrastructure to help address safety issues in Richmond. This BPAP provides a set of infrastructure recommendations and actions for the City of Richmond to effectively improve the safety of vulnerable roadway users biking, walking, and rolling (e.g., using micromobility devices, wheelchairs, and so on) in the short to medium term. Working in tandem with the LRSP as part of the Travel Safe Richmond initiative, this BPAP's primary goal is to guide Richmond toward a balanced transportation system that is safe, comfortable, accessible, and equitable for people of all ages and abilities.

The BPAP lays out a strategy to develop comprehensive bicycling and walking networks that provide access to transit,



*Richmond residents bicycling along Bay Trail.*

schools, parks, trails, the waterfront, and downtown. The BPAP considered the recommendations included in the City's 2011 Bicycle Master Plan and Pedestrian Plan, which provides visions for a long-term future, including policy and program recommendations. This BPAP also provides an implementable strategy to design and construct new infrastructure in the near and medium term, with prioritization and phasing to ensure that safety improvements and network gap-closing projects are manageable and fundable. Project recommendations were developed based on a detailed needs analysis, safety analysis from the LRSP, and community engagement.

The following chapters are included in the BPAP:

1. An introduction to the plan and process
2. An overview of community engagement
3. Bicycle project recommendations
4. Pedestrian project recommendations
5. Guidance for implementation

A set of appendices were also developed and include an update to the City's bicycle facility design guidelines and a list of available sources of funding to jump-start the implementation progress.



*Richmond resident walking along the Bay Trail.*

The recommendations included in this plan are designed to provide short-term infrastructure improvements which focus on decreasing the risk of collisions for people walking, biking, rolling, and driving across Richmond. Data on bicycle- and pedestrian-involved collisions provided insight into locations and roadways representing the biggest safety challenges.

Richmond has a history of community-driven planning projects (i.e., neighborhood

and corridor plans) guiding bicycle and pedestrian planning. This BPAP consolidates and sets those ideas into a prioritized set of feasible, immediate actions. Further, the plan combines past planning efforts, existing guidance, and documentation to create a set of achievable objectives and projects for the City of Richmond to implement.

The BPAP included a multifaceted community engagement process. The City used multiple engagement methods and partnerships to

further the reach and effectiveness of the engagement opportunities. Community engagement included three community workshops; three pop-up events, the development of a project website with an interactive webmap; coordination with the City's Bicycle and Pedestrian Advisory Committee (BPAC); and, numerous meetings with neighborhood councils. The project website was available in English and Spanish, and Spanish-speaking staff were available at all community workshops and pop-up

events. The City partnered with [Rich City Rides](#) to lead community engagement with Richmond’s neighborhood councils. Throughout the BPAP’s community engagement process, there were over 500 interactions with community members and stakeholders.

The BPAP recommends over 86 miles of new or improved bicycle facilities as well as pedestrian spot improvements at 111 locations. Recommendations include projects from other Richmond corridor and specific plans and the recently approved Local Road Safety Plan (LRSP). The recommended improvements directly respond to safety concerns and community feedback.

Four categories drove the recommendation of projects:

- Safety
- Health and Equity
- Connectivity
- Community Support

The BPAP sets forth 77 high priority projects, 105 medium priority projects, and 110 opportunity projects. **Table 01** shows the number of bicycle and pedestrian projects by prioritization category. These can be found in the tables and figures included in the following pages. The prioritized list of projects is not intended to be a hardened order of projects but rather a guide to support City of Richmond staff in selecting

projects that can fill a variety of grants, repaving, or opportunistic situations.

The maps and tables on the following pages summarize the high-priority bicycle and pedestrian projects. The prioritized lists of proposed projects create an equity-and safety-focused strategy to guide implementation of projects with the highest community impact. However, as development occurs or other changes to the City’s transportation network take place, the framework can be used to reevaluate remaining projects and continue pursuing the BPAP’s implementation. The full prioritization breakdown can be found in [Chapter 5](#).

**Table 01** Project Prioritization Category by Project Type

	HIGH-PRIORITY	MEDIUM-PRIORITY	OPPORTUNITY	TOTAL
Bicycle Projects	44	64	73	181
Pedestrian Projects	33	41	37	111



**Table 02** High-Priority Bicycle Improvement Projects (Corridor)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE
Carlson Blvd	Richmond Greenway	Broadway	Class I Shared-Use Path	0.07	81
23rd St Overcrossing	Richmond Greenway	Richmond Greenway	Class I Shared-Use Path	0.11	80
Central Ave	Jacuzzi St	Pierce St	Class I Shared-Use Path	0.10	79
Harbour Way	Richmond Greenway	Macdonald Ave	Class II Bicycle Lane	0.31	77
16th St	Macdonald Ave	Livingston Ln	Class IV Separated Bikeway	0.01	77
Macdonald Ave	Harbour Way	16th St	Class III Bicycle Route	0.32	77
16th St	Nevin Plaza	Richmond Greenway	Class IIIB Bicycle Boulevard	0.08	77
Nevin Ave	Marina Way	15th St	Class IIIB Bicycle Boulevard	0.05	76
Pierce St	Central Ave	Cerrito Creek	Class IV Separated Bikeway	0.23	75
Marina Way	Macdonald Ave	Richmond Greenway	Class II Bicycle Lane	0.30	75
S 49th St	Wall Ave	Cutting Blvd	Class IIIB Bicycle Boulevard	0.17	75
23rd St	Broadway	Brooks Ave	Class II Bicycle Lane	0.61	75
Espee Ave	Bissell Ave	Trail south of Chanslor Ave	Class IIIB Bicycle Boulevard	0.19	75
Carlson Blvd	Bayview Ave	Broadway	Class IV Separated Bikeway	1.81	73
Carlson Blvd	Bayview Ave	Tehama Ave	Class IIB Buffered Bicycle Lane	0.49	72
Bayview Ave	Seaport Ave	S 55th St	Class IIB Buffered Bicycle Lane	0.36	72
Barrett Ave	19th St	Marina Way	Class IV Separated Bikeway	0.21	72
Plaza Way	S 49th St	S 50th St	Class IIIB Bicycle Boulevard	0.05	72
Ohio Ave	Harbour Way	2nd St	Class IIIB Bicycle Boulevard	0.42	72
Barrett Ave	19th St	22nd St	Class II Bicycle Lane	0.20	71
Harbour Way	Macdonald Ave	Barrett Ave	Class II Bicycle Lane	0.19	71

**Table 02** High-Priority Bicycle Improvement Projects (Corridor) (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE
New Shared-Use Path	S 28th St	S 29th St	Class I Shared-Use Path	0.07	70
Nevin Ave	8th St	11th St	Class IIIB Bicycle Boulevard	0.16	70
San Joaquin St	Central Ave	Imperial Ave	Class III Bicycle Route	0.83	69
Berk Ave - S 49th St	Cutting Blvd	Cutting Blvd	Class IIIB Bicycle Boulevard	0.78	68
Spring St	S 29th St	Regatta Blvd	Class IIIB Bicycle Boulevard	0.52	68
Tewksbury Ave	Santa Fe Ave	Washington Ave	Class IV Separated Bikeway	0.10	68
22nd St	Brooks Ave	Bissell Ave	Class II Bicycle Lane	0.49	68
Chanslor Ave	2nd St	8th St	Class IIIB Bicycle Boulevard	0.32	67
Macdonald Ave	Richmond Parkway	Harbour Way	Class II Bicycle Lane	0.70	67
Cutting Blvd	Hoffman Blvd	Carlson Blvd	Class IV Separated Bikeway	1.43	67
BNSF Easement near Railroad Ave (not acquired yet)	Richmond Ave	Washington Ave/ Tewksbury Ave	Class I Shared-Use Path	0.23	66
Bissell Ave	Richmond Parkway	Espee Ave	Class IIIB Bicycle Boulevard	1.29	66
Ells St	Fleming Ave	Bayview Ave	Class IIIB Bicycle Boulevard	0.11	65
Macdonald Ave	16th St	Key Blvd	Class II Bicycle Lane	1.80	65
Miraflores Greenbelt - Ohio Connection	S 45th St	Miraflores Greenbelt	Class I Shared-Use Path	0.10	65
45th St	Nevin Ave	Macdonald Ave	Class IIIB Bicycle Boulevard	0.08	65
Ohio Ave	17th St	23rd St	Class II Bicycle Lane	0.30	65
25th St	Macdonald Ave	Roosevelt Ave	Class IIIB Bicycle Boulevard	0.30	65
San Pablo Ave	Natalie Ct (City Boundary)	Macdonald Ave (City Boundary)	Class IV Separated Bikeway	1.34	65
McBryde Ave	San Pablo Ave	Wildcat Canyon Parking Lot	Class II Bicycle Lane	0.65	65

# HIGH PRIORITY PEDESTRIAN SPOT IMPROVEMENTS

## TRAVEL SAFE RICHMOND

### PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

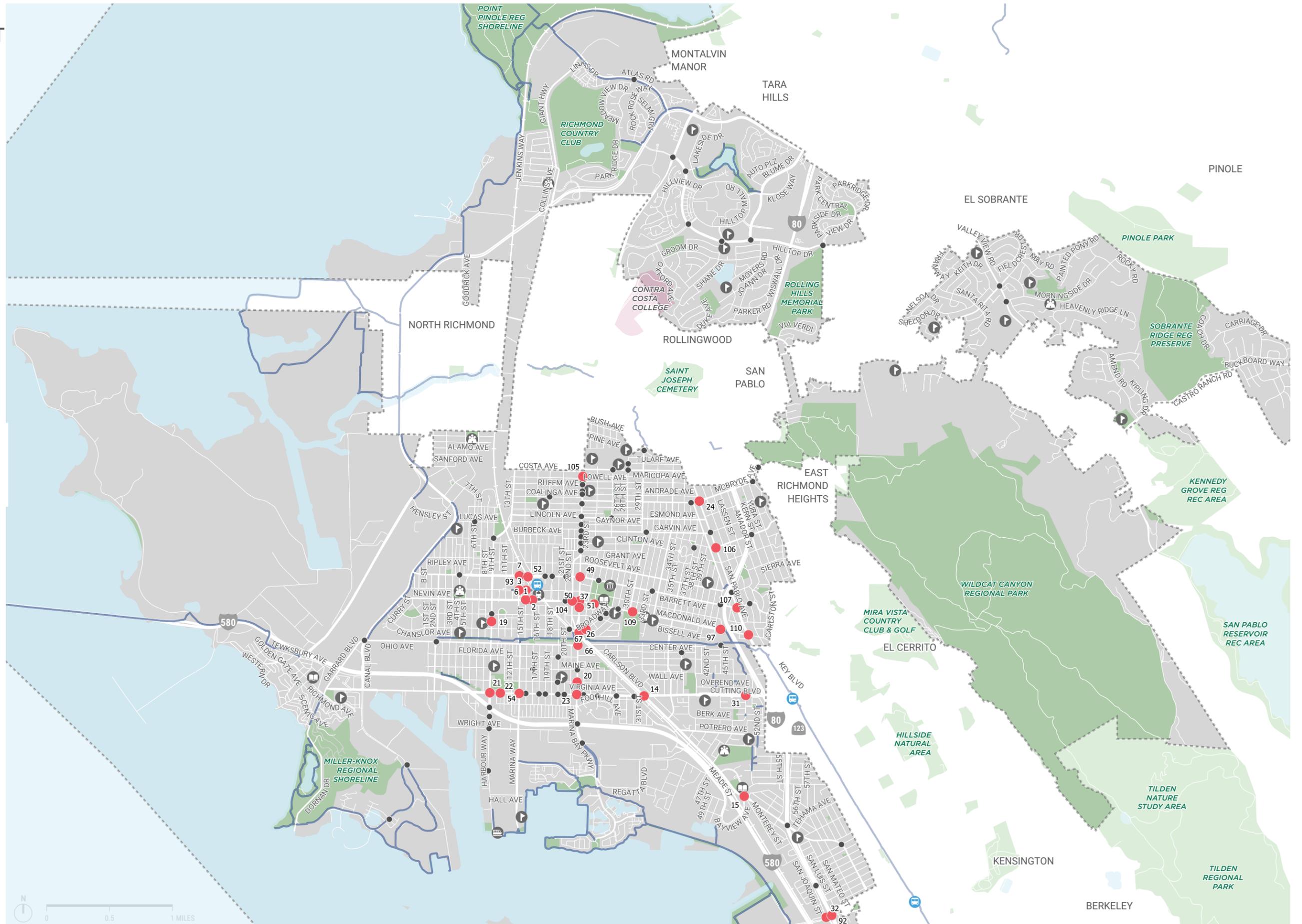
- Prioritization Category
- High-Priority Project
  - Medium-Priority and Opportunity Projects

### EXISTING PEDESTRIAN FACILITIES

- Class I Shared-Use Path

### BOUNDARIES + DESTINATIONS

- 🚇 BART Station
- 🚆 Amtrak Station
- 🚢 Ferry Terminal
- 🎓 School
- 🏛️ City Hall
- 📖 Library
- 🏠 Community Center
- 🌳 Park
- 🎓 Contra Costa College
- 🗺️ City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/14/2022.

Figure ii High-Priority Pedestrian Spot Improvement Projects

**Table 03** High-Priority Pedestrian Spot Improvements

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT TYPE	RECOMMENDATION	PRIORITIZATION SCORE
2	Macdonald Ave	15th St	Crossing Improvement	Consider constructing a raised intersection or raised crosswalk at the eastern approach. Construct curb extensions at all four corners. Install high-visibility crosswalks at the eastern and western approaches on top of decorative paving.	81
26	Broadway	23rd St	Intersection Upgrade	Widen, lengthen, and channelize median islands. Restripe crosswalks as high-visibility crosswalks.	81
31	S 49th St	Cutting Blvd	Lighting	LRSP high-injury intersection,: install intersection lighting.	81
32	San Joaquin St	Central Ave	Crossing Improvement	LRSP high-injury intersection: construct bulb outs and install advanced warning signs.	81
19	Harbour Way	300' north of Chanslor Ave	Crossing Improvement	Install a high-visibility mid-block crosswalk with a median refuge island.	80
67	Broadway	24th St	Crossing Improvement	Construct curb extensions at all corners.	80
92	Central Ave	I-80	Crossing Improvement	Coordinate with Caltrans to upgrade all crosswalks to high-visibility crosswalks and provide leading pedestrian intervals for all crossing phases. Extend bicycle conflict markings on Central through the Jacuzzi intersection and interchange. Long term, construct curb extensions to tighten radii and square up approaches.	80
37	25th St	Macdonald Ave	Crossing Improvement	LRSP high-injury intersection: Upgrade all crosswalks to high-visibility. Consider installing RRFB or PHB. Construct curb extensions at all corners.	79
109	Macdonald Ave	Between 30th and 31st St	Crossing Improvement	Refresh the existing midblock crosswalk, install advance yield markings, and an RRFB. Construct curb extensions for the Macdonald crosswalk.	79
51	23rd St	Exchange PI	Crossing Improvement	Construct a median refuge island and install an RRFB for a crossing of 23rd Street.	78
66	Ohio Ave	S 23rd St	Crossing Improvement	Construct curb extensions at all corners.	78
93	Nevin Ave	Marina Way	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks and provide a leading pedestrian interval for call crossing phases. Long term, consider converting the intersection to a raised intersection.	78
1	Macdonald Ave	16th St	Intersection Upgrade	Consider scramble phase or otherwise don't allow permitted left turns to conflict with pedestrians in the crosswalk. Create leading pedestrian interval. Consider parklet on southwest corner.	77

**Table 03** High-Priority Pedestrian Spot Improvements (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT TYPE	RECOMMENDATION	PRIORITIZATION SCORE
15	Carlson Blvd	Bayview Ave	Intersection Upgrade	Install intersection improvements including curb extensions and a median nose.	77
20	S 23rd St	Virginia Ave	Crossing Improvement	Consider installation of a pedestrian refuge island and install pedestrian-scale lighting.	77
110	Macdonald Ave	San Pablo Ave	Intersection Upgrade	Study removal of the free-right turn lane and options to straighten crosswalks. Upgrade all crosswalks to high-visibility and provide a leading pedestrian interval for all crossing phases.	77
3	Nevin Ave	15th St	Crossing Improvement	Consider constructing a median refuge or traffic circle to accommodate direct pedestrian path of travel.	76
6	15th St	Nevin Ave	Bicycle Access	Provide a ramp to allow bicycle access to/from plaza.	76
7	Marina Way	Barrett Ave	Intersection Upgrade	Install a curb extension at the northwest and southwest corners. Provide a leading pedestrian interval and adjust pedestrian phase length to provide sufficient crossing times. Realign the southern crosswalk several feet south and install high-visibility crosswalks at the north and eastern approaches. Consider installing bicycle lane conflict markings and a two-stage bike turn box for NB-WB bike movements.	76
14	Carlson Blvd	Cutting Blvd	Intersection Upgrade	Construct intersection improvements including: formalized curb extensions, widened sidewalk, and additional sidewalks.	76
21	Harbour Way	Cutting Blvd	Crossing Improvement	Install curb extensions, directional ramps and high-visibility crosswalks, and median crossing islands.	76
22	Marina Way	Cutting Blvd	Crossing Improvement	Install curb extensions, directional ramps and high-visibility crosswalks and median crossing islands.	76
23	S 23rd St	Cutting Blvd	Crossing Improvement	Restripe crosswalks as high-visibility crosswalks. Install curb extensions at all corners with directional ramps. Construct median crossing islands.	76
49	23rd St	Barrett Ave	Crossing Improvement	"Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Install bicycle boxes at the 23rd Street approaches. Install curb extensions at both western corners."	76
50	23rd St	Macdonald Ave	Crossing Improvement	"Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Install bicycle boxes at the 23rd Street approaches. Install curb extensions at both western four corners."	76
52	Barrett Ave	BART Tracks	Sidewalk	Widen sidewalk on northern side through underpass (Requires road diet).	76

**Table 03** High-Priority Pedestrian Spot Improvements (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT TYPE	RECOMMENDATION	PRIORITIZATION SCORE
54	Cutting Blvd	S 12th St	Crossing Improvement	"Install high-visibility crosswalks at all approaches."	76
97	Macdonald Ave	45th St	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks and install advance yield markings. Install an RRFB for the Macdonald crosswalks. On the south side of the street, widen the sidewalk and provide a connection to the "Target Path."	76
104	22nd St	Macdonald Ave	Crossing Improvement	Install curb extensions at the northwest and northeast corners. Install a pedestrian count display at the southwest corner. When next repaved, reduce the intersection's crown and conform asphalt to the gutter pan.	76
106	Solano Ave	San Pablo Ave	Crossing Improvement	Refresh all crosswalks. Provide a leading pedestrian interval for all crossing phases. Construct curb extensions for the San Pablo crossings.	76
107	Barrett Ave	San Pablo Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Mark a high-visibility across the northern approach. Construct transit-friendly curb extensions at all four corners. Install bicycle detection.	76
24	San Pablo Ave	McBryde Ave	Intersection Upgrade	Install curb extensions and ramps, and construct curb extensions so that streets intersect at right angles. Upgrade all crosswalk to high-visibility crosswalks.	60
105	23rd St	Rheem Ave	Crossing Improvement	Upgrade all curb ramps to current best practices; specifically, replace the southwest corner ramp with a "parallel" ramp and "centered" ramps at the two eastern corners. Adjust pedestrian signal heads as needed. Provide a leading pedestrian interval for all crossing phases.	60



Chapter

01

# Introduction



*A group ride in Richmond.*

## Travel Safe Richmond

In 2021 the City embarked in a two-pronged approach to improving safety for all roadway users. Travel Safe Richmond, as the initiative was named, included a Local Roadway Safety Plan (LRSP) and a complementary Bicycle and Pedestrian Action Plan (BPAP). Both components of Travel Safe Richmond work together to create unified policies and infrastructure recommendations for improving roadway safety and comfort for roadway users of all ages and abilities. This chapter describes those efforts and details how the BPAP was developed.

The BPAP covers: 1) an introduction to the plan and process, 2) an overview of community engagement, 3) bicycle project recommendations, 4) pedestrian project recommendations, and 5) directions for implementation. Additionally, the appendices include an update to the City's bicycle facility design guidelines and a list of available sources of funding to jump-start the implementation progress.

# Local Roadway Safety Plan

Traffic safety impacts the health and comfort of all who live and travel in Richmond. The City of Richmond's Local Roadway Safety Plan (LRSP) identified traffic safety trends and developed systemic recommendations to fund and implement infrastructure improvements to help address safety issues. Implementing the LRSP is a step toward making Richmond's transportation network safer and more equitable for all users.

The LRSP's primary goals are to:

- Reduce fatal and serious injury collisions
- Ensure equitable traffic safety investments in the neighborhoods that need them most
- Support safe travel for people walking and biking, especially near schools and other high-demand areas
- Encourage safe driving through roadway design and outreach
- Prepare for the future with climate-resilient transportation safety infrastructure
- Improve emergency vehicle response and access

The Richmond City Council adopted the LRSP on July 19, 2022. The recommendations from the LRSP have been incorporated into the BPAP's recommendations.



*City of Richmond Local Road Safety Plan, adopted July 2022.*

# Bicycle and Pedestrian Action Plan

The Bicycle and Pedestrian Action Plan (BPAP) works toward building a balanced transportation system that is safe, comfortable, and accessible for all users with a focus on improving conditions for people walking, biking, and rolling (i.e., on wheelchairs, skateboards, scooters, and other emerging micromobility options). The BPAP lays out a strategy to develop comprehensive bicycling and walking networks that provide access to transit, schools, parks, trails, downtown, and other community destinations. As part of this effort, the City developed a set of project recommendations based on thorough needs analysis and community engagement processes. The BPAP serves as the blueprint for improving walking and bicycling conditions in Richmond for the next five years. The BPAP presents a short-term set of actions and projects recognizing that funding and resources will incrementally build upon these improvements over time. This plan also provides a plan to ensure implementation is manageable and fundable. Input from City stakeholders and community members played a critical role in the development of BPAP.

This BPAP consolidates safety recommendations derived from the LRSP and other past planning efforts including

corridor plans and studies, to provide comprehensive near-term bicycle and pedestrian infrastructure improvements. It is the hope of the City that the proposed improvements will make walking, biking, rolling, transit access, and driving throughout Richmond safer, easier, and more practical. As part of its scope, the BPAP includes:

- A list of near-term (1-5 year) infrastructure projects focusing on bicycle and pedestrian safety and comfort.
- A recommended bicycle and pedestrian network that builds on Richmond's existing assets and focus on closing existing gaps.
- A general set of design guidelines for implementing new or improved bicycle facilities and off-street paths ([Appendix B](#)).
- An implementation strategy that identifies potential funding opportunities and applies those to each project ([Appendix C](#)).

The proposed improvements will focus on making walking, rolling, and biking in Richmond safer as well as address key gaps in the regional bicycle and pedestrian network. The proposed improvements are



*Richmond Wellness Trail wayfinding.*

also geared toward enhancing access to and from important regional multi-use paths, such as the Bay Trail and Richmond-San Rafael Bridge as well as regional transit including BART, Golden Gate Transit, Amtrak, and Capitol Corridor, and improved access to ferry services offering direct access to downtown San Francisco across the Bay. As noted, the proposed network extends well beyond Richmond's borders and provides improved access for residents, employees, patrons, and tourists requiring regional access.

## Making Streets Safe for All Users

Natural and infrastructure barriers (ex. water features, railroads, highways) can limit connectivity, alter travel behavior, and directly affect modal access. The City completed a demand analysis to understand how safely and comfortably residents are able to access important neighborhood destinations using low-stress routes, as well as to understand deficiencies in the network for people biking and walking, the study team completed a demand analysis. The City team then overlaid these high-demand

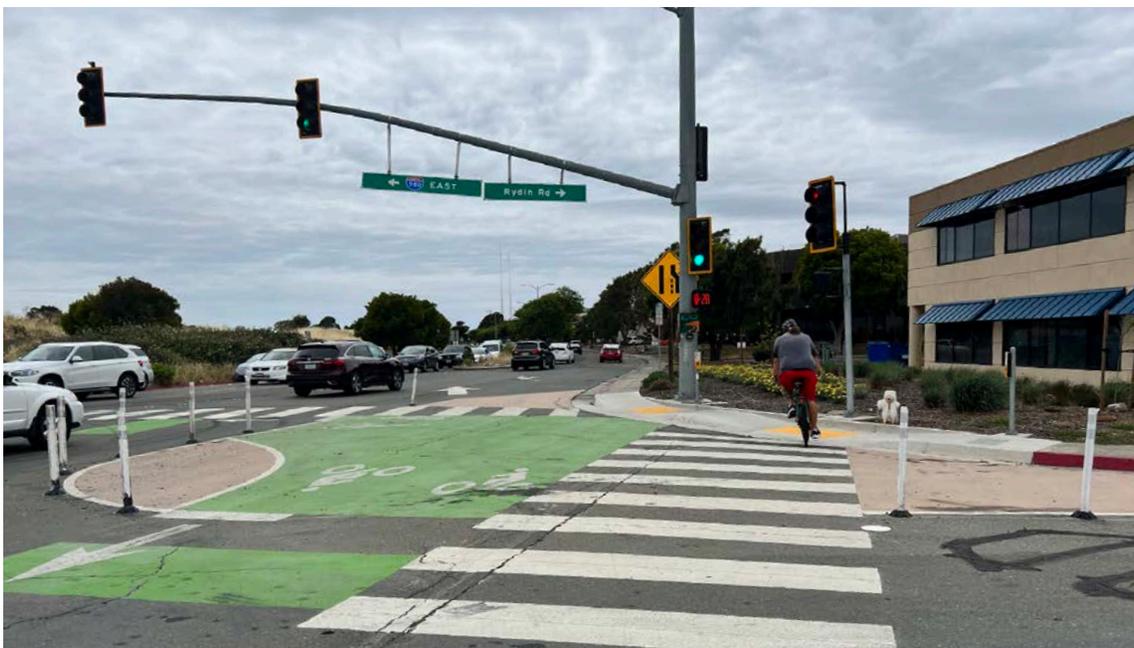
areas with collision data better comprehend where safety improvements could benefit the most people. By understanding these deficiencies and barriers, the City developed recommendations for providing safe and convenient access to community destinations and activity centers, both vital elements to the physical and mental well-being of community members.

The City also embarked on an analysis of collision data to understand where and how collisions were happening throughout the City. Using data from the University of California Berkeley Transportation Injury

Mapping System (TIMS) for the previous five years (2015-2019), the City identified where bicycle or pedestrian collisions occurred in Richmond. Several corridors exhibited a high concentration of pedestrian/bicycle-involved collisions. The LRSP identified corridors with elevated collision levels and grouped them to create a multimodal high-injury network, shown in **Figure 01**. This analysis from the LRSP informed the efforts of the BPAP.

## Past Efforts Focused on Making City Streets Safer

Over the past several years, the City has developed numerous citywide plans that set safety-focused policies and goals. Richmond has also advanced corridor plans that include multimodal access and safety recommendations for specific corridors, as well as area plans that prioritize improvements across broader regions. The Contra Costa Transportation Authority (CCTA) has also developed and begun implementing countywide plans that support the City of Richmond's efforts and work towards unified regional connectivity at the county level. In general, many of the documents reviewed for the development of this BPAP emphasize the need for a transportation system that supports safe, comfortable, and equitable transportation networks for vulnerable users (e.g., people walking, biking, and rolling – especially youth, seniors, and those with limited physical mobility or limited mobility options).



*A Richmond resident biking through a protected intersection on Central Avenue.*

# Multimodal High Injury Network

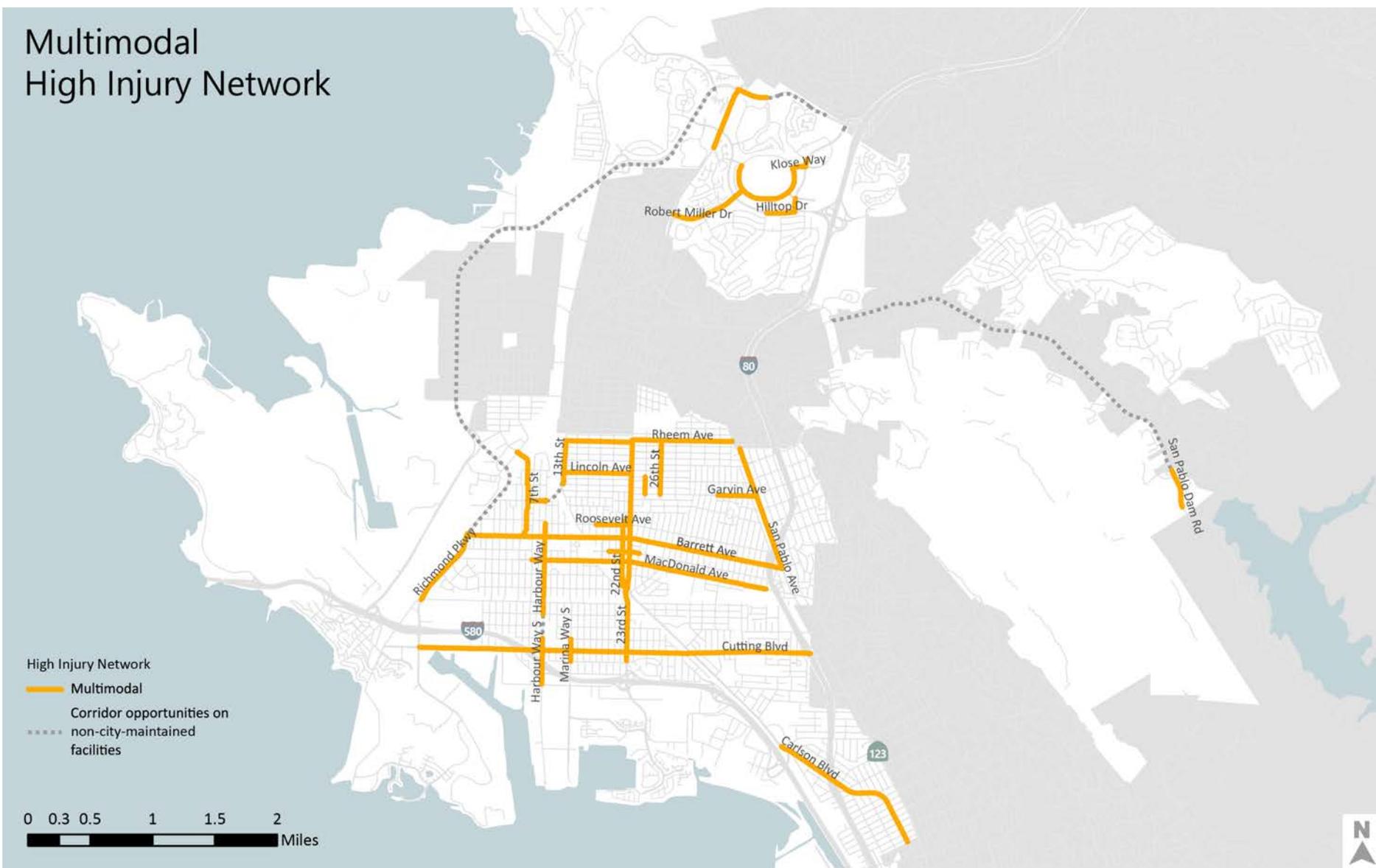


Figure 01 Multimodal High Injury Network (LRSP)

Major themes throughout the documents reviewed included:

- Need for improving safety and comfort of all users
- Need for improving connectivity and access to multimodal transportation networks under a more equitable approach
- Need to enhance connectivity to neighboring jurisdictions
- Need to standardize implementation of active transportation facilities and networks
- Need to improve quality of life by focusing on improving health (personal, environmental, and economic)
- Commitment to encourage and promote walking and bicycling as viable modes of transportation

The recommendations included in this plan consider these key themes and the previous infrastructure recommendations made in the plans reviewed, which are noted in **Table 04**. Additional information about the plans reviewed can be found in [Appendix A](#).

## Sidewalks

Sidewalks are critical pieces of infrastructure for people walking and rolling. A number of roads in Richmond, however, are missing sidewalks on one or both sides of the street. The following map, **Figure 02**, shows known sidewalk gaps and locations with sidewalks only on one side of the street. This map shows gaps identified by

City staff during a staff review of limited locations across Richmond. A full inventory of existing sidewalks was not completed as part of this project and, therefore, the data is incomplete. Sidewalk-related policy and program recommendations can be found in [Chapter 5](#).

**Table 04** Richmond Active Transportation-Related Planning Documents Reviewed

DOCUMENT	AGENCY	YEAR
Richmond General Plan	City of Richmond	2012
Richmond Bicycle Master Plan	City of Richmond	2011
Richmond Pedestrian Plan	City of Richmond	2011
23rd Street Streetscape Improvement Plan	City of Richmond	2018
Rumrill/13th Street Complete Street Study	City of San Pablo and City of Richmond	2015
South Richmond Transportation Connectivity Plan	City of Richmond	2015
Yellow Brick Road Iron Triangle Walkable Neighborhood Plan	City of Richmond and Pogo Park	2015
Richmond Wellness Trail Study	National Park Service and City of Richmond	2017
First Mile/Last Mile Transportation Strategic Plan	City of Richmond	2019
Harbour Way Complete Streets	City of Richmond	2022
Ferry to Bridge to Greenway Complete Streets Plan	City of Richmond	2021
BART Walk and Bicycle Network Gap Study	BART	2020
Contra Costa Countywide Bicycle and Pedestrian Plan	Contra Costa Transportation Authority	2018
Richmond Area Community-Based Transportation Plan	Contra Costa Transportation Authority	2020



## Health and Equity

Historically disadvantaged and vulnerable populations may rely more on walking and bicycling to meet daily needs. Safe, healthy, affordable, and convenient transportation options are not always available to the disadvantaged populations that need them most. These low-income and unserved communities have historically not been a part of past conversations about transportation and planning, leading to systemic underinvestment and conditions where pedestrians and bicyclists are overrepresented in collisions. A lack of high-quality walking, biking, and transit infrastructure can result in long, unhealthy, unaffordable, and riskier (people bicycling and walking are overrepresented in collisions) travel for some of Richmond's most vulnerable populations.

Uneven distribution of active transportation infrastructure, referred to in this plan as bicycle and pedestrian infrastructure, also results in health, safety, mobility, and economic benefits accruing to those who are more socio-economically fortunate while increasing hardships for Richmond's most vulnerable and disadvantaged populations.

By prioritizing active transportation infrastructure for these disadvantaged populations, more Richmond residents will be able to navigate the City they call home. With this in mind, the City embarked on an analysis of equity and health deficiencies based on available data.

### Why Did We Complete This Analysis?

Research indicates that communities with higher health risk factors tend to have less access to roadway infrastructure that promotes walking and biking.<sup>1</sup> Walking, bicycling, and other forms of physical activity benefit community members' physical and mental health. Increasing physical activity can help people reduce their risk of coronary heart disease, stroke, diabetes, and other chronic diseases. That can also lower health care costs and improve the quality of life for people of all ages, particularly children and seniors with more limited mobility options. By prioritizing abicycle and pedestrian infrastructure for these populations, the City can help improve safety, and residents can reduce their transportation costs and healthcare burden. **Figure 03** shows the weighted variables that compose the equity and health index analysis.

To understand which neighborhoods experience the highest rate of health-related issues, the City completed a health analysis. This analysis included four variables:

- Life expectancy
- High blood pressure
- Heart disease
- Diabetes

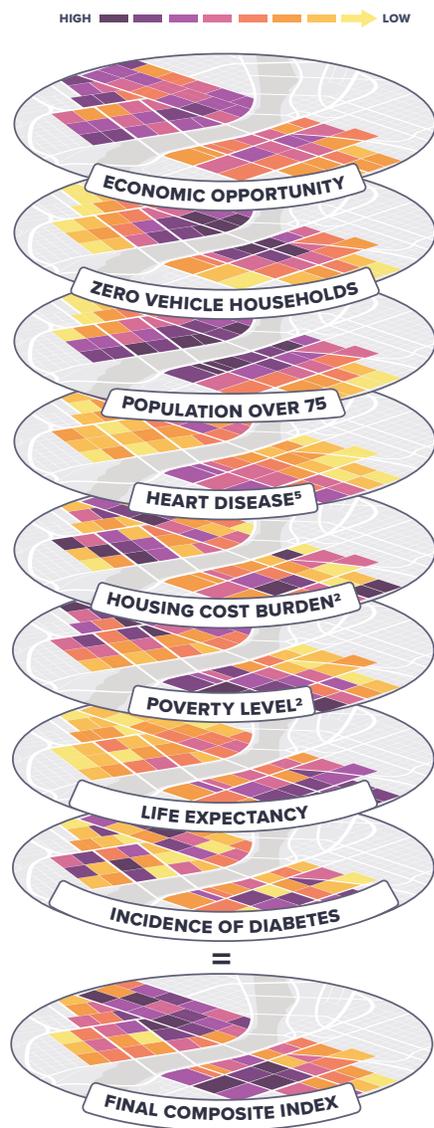
These four variables were combined into an index to provide a holistic understanding areas of the City experiencing the highest impacts of health related issues. As shown in **Figure 04**, the areas with the highest health burdens include the central core, including the Richmore Village, Pullman, Santa Fe, and Coronado neighborhoods, and the southern portion of the City between I-80 and I-580 including the Parkview, and Southwest Annex neighborhoods. Other areas of the City disproportionately impacted by health burdens include the Fairmede/Hilltop, Hilltop Green, and May Valley neighborhoods.

To complement the health analysis, the project team completed a socio-economic analysis or equity index. This analysis used the following statistics to understand

1. Mahmoudi, J. "Health impacts of nonmotorized travel behavior and the built environment: Evidence from the 2017 National Household Travel Survey." (2022). *Journal of Transport & Health*, 26. Maizlish, N. "Increasing walking, cycling, and transit: Improving Californians' health, saving costs, and reducing greenhouse gases." (2016). California Department of Public Health: Office of Health Equity.

## How do we compile the index?

Eight variables relating different dimensions of health and equity are aggregated to census block group geographies and are then compiled into a composite index.



**Figure 03** Health and Equity Analysis Process

where the highest concentration of socio-economically burdened residents is within the City:

- Low-income households
- Population over age 75
- Rent-burdened population
- Zero-vehicle households

The indexed analysis is noted in **Figure 05**. The areas of Richmond with the highest equity needs include the central part of the City between Cutting Boulevard and Macdonald Avenue and the Iron Triangle area. The combined health and equity index indicates the communities with the greatest needs include the North and East, Richmore Village, Park Plaza, Coronado, and Cortez/ Stege neighborhoods.

**Figure 06** shows the combined health and equity index scores for the entire City.

## How Did We Use These Analyses?

The recommendations put forth in this BPAP were informed by the health and equity analyses and reflect where the most need in the community is. The results of these analyses were integral to the prioritization and ranking for proposed bicycle and pedestrian improvement projects throughout the City. Part of the prioritization scoring criteria includes the results of the health and equity analyses (see [Chapter 5](#) for details). Following score calculations, improvements were sorted into high, medium, and opportunity priority categories based on the distribution of scores. These data can inform quick, effective changes Richmond can more readily implement to make tangible differences in the community.

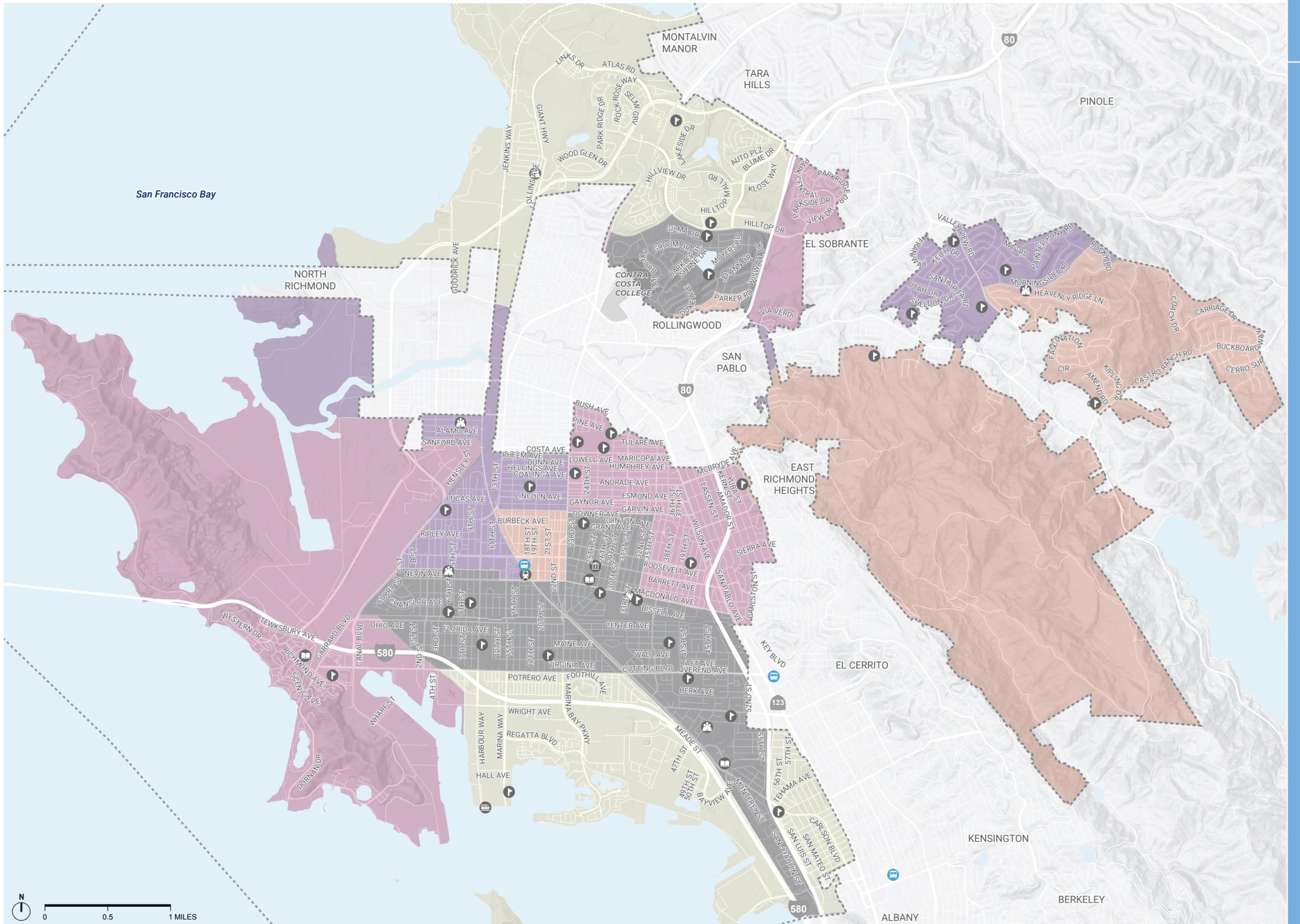
# HEALTH INDEX SCORES

## HEALTH INDEX

- Top Quintile (Highest Need)
- Second Highest Quintile
- Middle Quintile
- Second Lowest Quintile
- Lowest Quintile (Lowest Need)

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, Ecopia, and Contra Costa County. Document: N:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 11/23/2021

Figure 04 Health Index Score Map

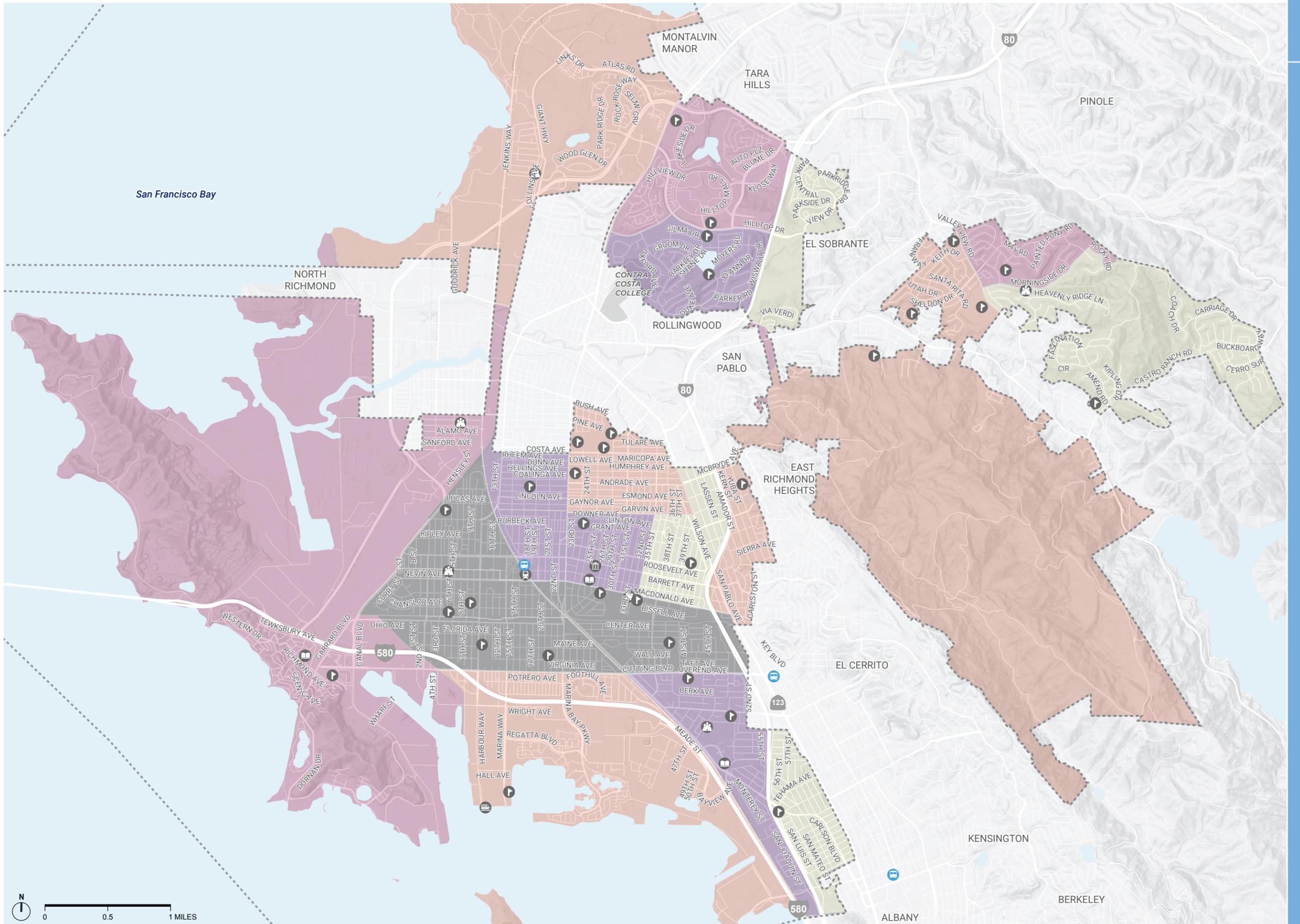
# EQUITY INDEX SCORES

## EQUITY INDEX

- Top Quintile (Highest Need)
- Second Highest Quintile
- Middle Quintile
- Second Lowest Quintile
- Lowest Quintile (Lowest Need)

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, Ecopia, and Contra Costa County. Document: N:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 11/23/2021

Figure 05 Equity Index Score Map

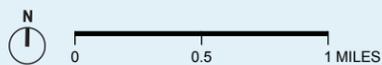
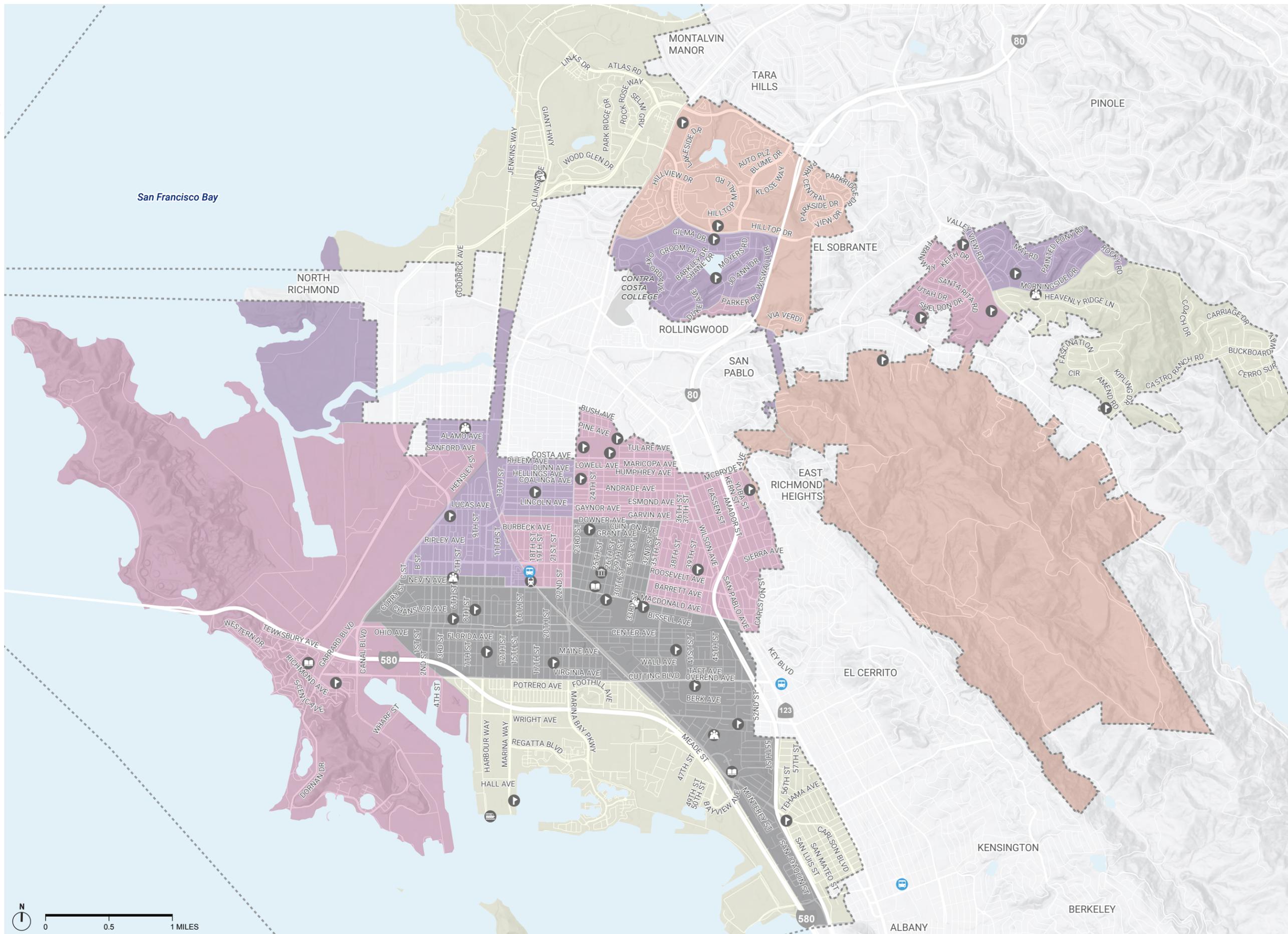
# COMPOSITE HEALTH & EQUITY INDEX SCORES

## HEALTH + EQUITY INDEX

- Top Quintile (Highest Need)
- Second Highest Quintile
- Middle Quintile
- Second Lowest Quintile
- Lowest Quintile (Lowest Need)

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, Ecopia, and Contra Costa County. Document: N:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 11/23/2021

Figure 06 Health and Equity Combined Index Map

Chapter  
**02**

# Community Engagement



# Community Engagement

## Overview

The BPAP included a multifaceted community engagement process which included multiple outreach methods and partnerships to further the reach and effectiveness of the events. Community engagement included three community workshops, three pop-up events, a project website with an interactive webmap, coordination with the City's Bicycle and Pedestrian Advisory Committee (BPAC), and 12 meetings with neighborhood councils. Richmond partnered with Rich City Rides, a local non-profit focused on creating opportunities to improve health and economics in the City by promoting cycling as a social, sustainable and green mode of transportation. Rich City Rides helped lead community engagement with the City's neighborhood councils. The community engagement process lasted the entire length of BPAP's development from November 2021 to November 2022. The community engagement included three phases:

1. Existing conditions
2. Project recommendations
3. Draft BPAP



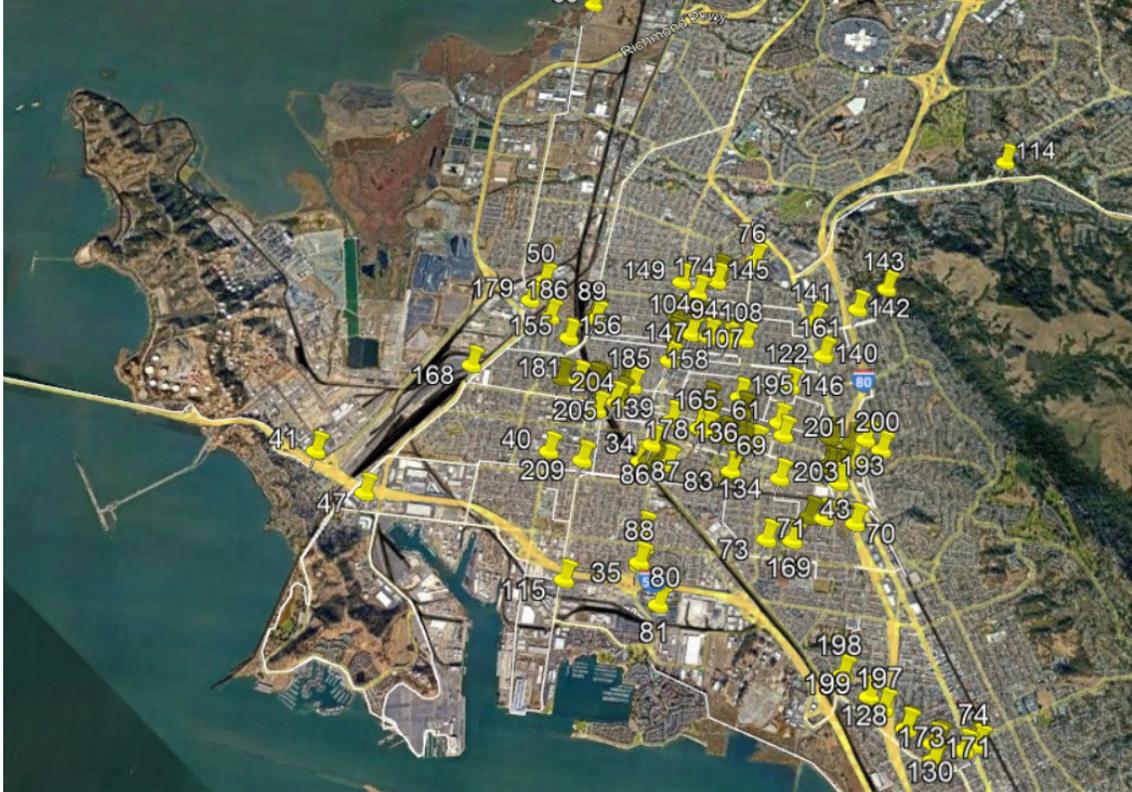
*The Travel Safe Richmond website homepage.*

During the existing conditions phase, community members provided comments on walking, bicycling, rolling, and any transportation safety issues within Richmond. The City used the feedback and information gathered from this phase to help inform the recommendations included in the LRSP and BPAP.

The second engagement phase enabled community members to provide input on draft walking and bicycling recommendations included in this BPAP. The draft recommendations were revised based on comments received in this engagement phase.

The third engagement phase presented revised project recommendations and the draft BPAP. Changes were incorporated into the final Plan before presentation to the BPAC and City Council.

Details on individual events and activities are provided in the next section. Overarching lessons and themes from the community engagement process are detailed in the subsequent section.



*This map shows the locations of community member comments on the Phase 1 interactive webmap.*

## Community Engagement Activities

### Phase 1: Existing Conditions (Fall 2021–Winter 2021-22)

#### Project Website and Interactive Webmap

As previously noted, the City promoted community engagement for the LRSP and BPAP projects under the unified Travel Safe Richmond project. The project website, [TravelSafeRichmond.org](https://TravelSafeRichmond.org), provided an overview of both transportation planning initiatives and their shared goals. The website promoted events for both initiatives. The website launched in September 2021 and remained active throughout the BPAP's preparation through the end of 2022. The website also included an interactive webmap requesting input from community members on where and how they bike. The webmap allowed community members to provide location-specific comments on existing walking and bicycling facilities and other locations throughout Richmond where they had safety, access, or connectivity feedback.

During this first engagement phase, community members provided 209 comments on the webmap, as well as 240 likes/dislikes from fellow community members. Over 1,100 community members visited the website during Phase 1 of the community engagement process.

#### BPAC Meetings

Throughout the development of the BPAP, the City provided regular updates on the plan's progress and coordinated feedback from the BPAC. In addition to periodic updates, the City presented the health and equity analysis to the BPAC during their January 2022 meeting. During the meeting, the City also shared the feedback from the first community workshop.

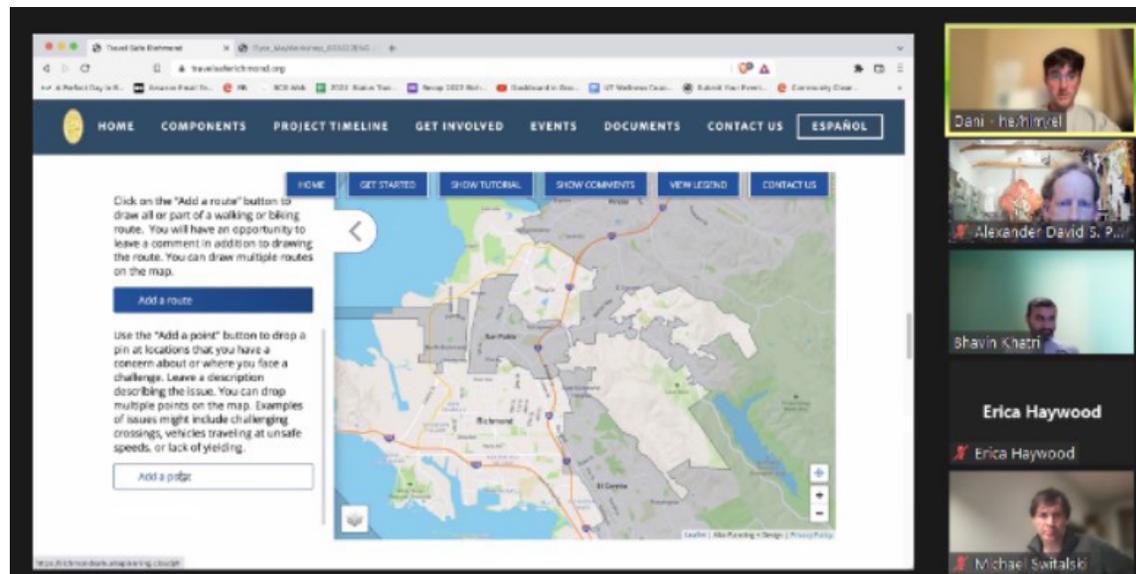
## Neighborhood Council Meetings

Rich City Rides was brought on as a member of the community engagement team to help support the City's efforts to deepen community engagement. Leveraging their deep ties to the Richmond community and other local organizations, Rich City Rides led the coordination and engagement with 12 neighborhood councils over the life of the project. They met with five neighborhood councils in the first phase, two in the second phase, and five in the third phase. Rich City Rides selected the neighborhood councils to present to based on their knowledge of the City to focus their efforts where it would be the most impactful.

During Phase 1 of community engagement, Rich City Rides met with the following neighborhood councils.

- Laurel Park Neighborhood Council
- Santa Fe Neighborhood Council
- Park Plaza Neighborhood Council
- Coronado Neighborhood Council
- Hilltop Neighborhood Council

These meetings promoted awareness of the BPAP initiative and encouraged community members to visit the project website to provide their comments.



*Rich City Rides conducting a demonstration of the interactive webmap for the Hilltop Neighborhood Council in April 2022.*



*Dani Lanis from Rich City Rides presenting to Coronado Neighborhood Council in April 2022.*



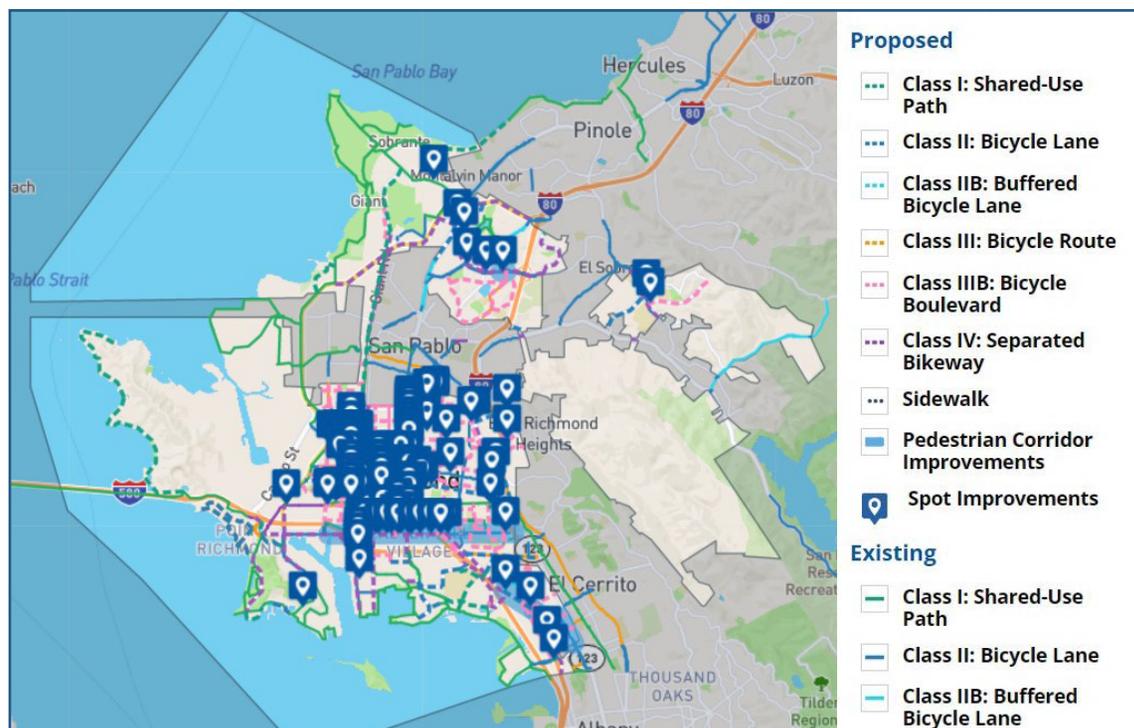
## Phase 2: Project Recommendations (Winter 2021/22–Summer 2022)

### Project Website and Interactive Webmap

Following the development of draft recommended improvement projects, the City updated the website to show draft pedestrian and bicycle recommendations. Community members and local stakeholders were asked to comment on, like, or dislike draft project recommendations. Interactive map users were also asked to indicate additional locations for the City to consider for bicycle and pedestrian improvement projects. In Phase 2, project recommendations were liked and disliked 171 times (164 likes and seven dislikes) and were left on the webmap by the community. Over 600 people visited the website during Phase 2.

### BPAC Meetings

City staff continued to provide regular updates to the BPAC on the BPAP and LRSP projects throughout this engagement phase. During the BPAC's April 2022 meeting, the City presented pedestrian and bicycle improvement project recommendations and requested feedback from the committee on ways to improve/enhance the proposed projects. The City also addressed questions from the BPAC on the recommended network. The City used feedback received from the BPAC to enhance the proposed projects.



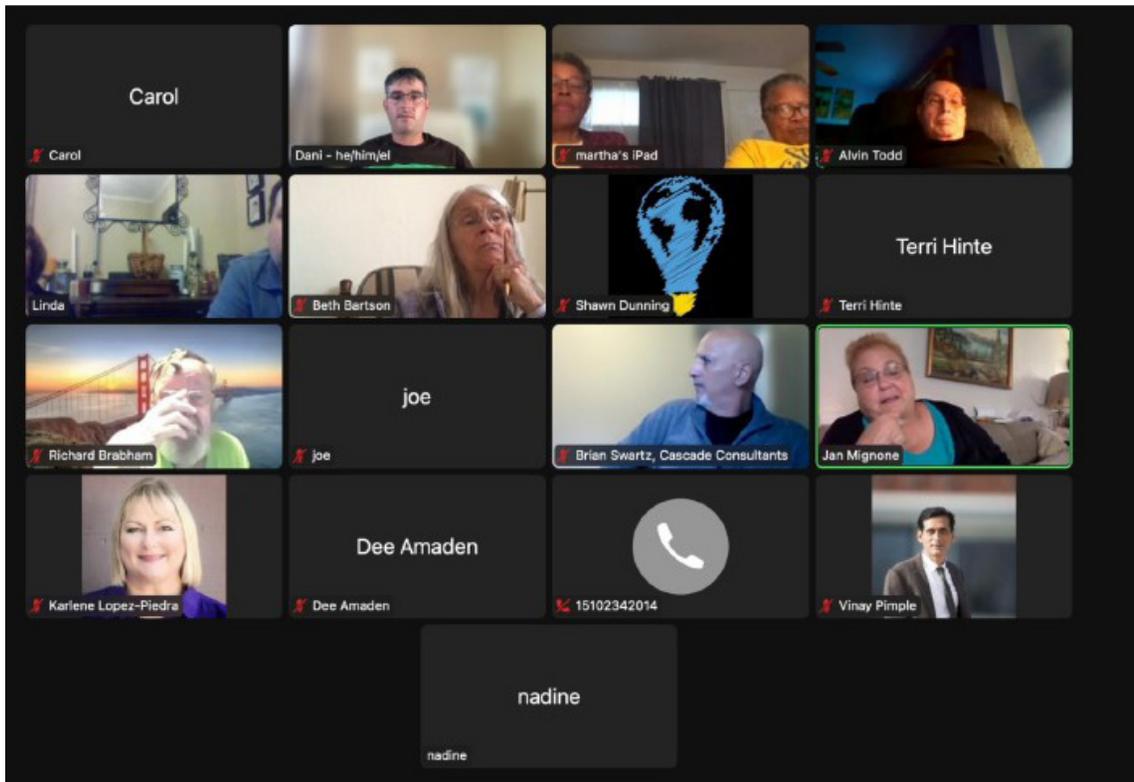
*During Phase 2, the City created an interactive webmap showing the draft recommended bicycle and pedestrian improvement projects. The map showed bicycle lanes (colored lines) and spot improvements (blue points).*

### Neighborhood Council Meetings

Rich City Rides continued to meet with neighborhood councils in Phase 2 of the community engagement process. These meetings continued to raise awareness for the Travel Safe Richmond initiative and focused on soliciting feedback on draft bicycle and pedestrian improvement projects through the interactive webmap. As Rich City Rides could not meet with every Neighborhood Council, the

project team prioritized meeting with the Richmond Neighborhood Coordinating Council (RNCC) as an opportunity to help spread the word about Travel Safe Richmond to every council. Rich City Rides met with the following Neighborhood Councils during Phase 2:

- Richmond Neighborhood Coordinating Council
- North and East Neighborhood Council



*Rich City Rides presenting to the North and East Neighborhood Council in May 2022.*

### Pop-Up Events

The BPAP was promoted at two pop-up events during engagement Phase 2. The pop-up events were:

- 23rd Street Bridge Project, April 2022 (Design charette)
- Unity Park Earth Day Event, April 2022 (Shared event with Rich City Rides)

The Earth Day event also included large plotted maps with project recommendations and informational boards that community members could comment on.

### Community Workshop

On the evening of Wednesday, May 18, 2022, the City hosted an in-person, outdoor community workshop at Richmond City Hall. The workshop was hosted in the central plaza and was organized around several stations. Stations included welcome/check-in, bicycle recommendations, pedestrian recommendations, project prioritization, and the LRSP. Attendees reviewed informational boards and other project materials and provided comments on project recommendations, proposed project prioritization, and the draft LRSP. Ten community members attended the workshop, and provided over 30 comments.



*Workshop attendees provided feedback on draft bicycle and pedestrian improvement projects at the May 2022 outdoor workshop.*

### Phase 3: Draft Plan–Fall-Winter 2022

The City hosted the third and final community workshop for the BPAP virtually on the evening of Wednesday, November 9, 2022. During the workshop, the project team provided a summary of updated infrastructure recommendations (based on community feedback) and presented the draft BPAP. The presentation also included a demonstration of the online interactive plan comment tool allowing users to share their feedback on the document. The workshop’s question-and-answer session enabled attendees to ask questions about the plan and share additional ideas for project recommendations. Eighteen community members attended the workshop.

### What We Heard

Across all community engagement phases and events, comments and feedback from community members generally fell into four categories:

- Safety
- Connectivity
- Safe routes to school
- Maintenance

A summary of the feedback for each theme is provided below:

#### Safety

- The speed of vehicular traffic should be reduced throughout the City.
- The City should implement traffic calming on residential streets to improve safety for all, especially for people walking, biking, and rolling.
- Highway interchanges represent a significant safety and connectivity barrier.
- Routes to community destinations like parks and schools need to be safe for people of all ages and abilities.
- Street lighting needs to be improved across the City. Enhanced lighting can improve traffic safety and perceptions of personal safety, and benefit trail users.
- The City should implement improvements that reduce the likelihood of multi-threat collisions (i.e., crossing multilane roads at uncontrolled locations). These improvements would significantly improve the safety and comfort of people crossing large arterial or collector streets.

#### Connectivity

- Richmond residents believe the City feels disconnected, and there is a lack of comfortable north-south routes to cross the City.
- Major arterial streets and freeways (ex., San Pablo Avenue, Carlson Boulevard, Giant Highway, I-580, I-80) act as barriers and limit connections across them.
- Community members want safer, more comfortable, and easier access to local community-serving destinations, including parks, schools, libraries, the waterfront/trails, and transit like BART.



*City resident walking along Richmond Wellness Trail.*



*Richmond Wellness along Marina Way, south of Florida Avenue.*

### Safe Routes to Schools

- The City should prioritize improving walking, rolling, and bicycling access to schools.
- The City should coordinate with school stakeholders, parents, and staff to provide a more holistic approach to safe routes to schools.

### Maintenance

- Sidewalks should be kept clean and repaired when needed.
- Trails and walking paths should be kept clear of debris and obstructions.
- Trails should be kept clear of dumping sites.

### Corridors and Intersections

In addition to these four themes, community members provided comments and suggestions for improvements along and across specific roads in Richmond. Across all engagement opportunities, community members consistently nominated several corridors and intersections for safety improvements. Those corridors included:

- 23rd Street
- Barrett Avenue
- Carlson Boulevard
- Cutting Boulevard
- Macdonald Avenue
- Richmond Wellness Trail
- San Pablo Avenue

The most frequently noted intersections by the community were:

- 23rd Street/Carlson Boulevard/Broadway
- 23rd Street/Garvin Avenue
- Richmond Greenway Gap Closure
- I-580/Marina Bay Parkway

Chapter

03

# Bicycle Recommendations





*Bicyclists use two-way separated bikeway along Ohio Avenue.*

## Bicycle Recommendations

The recommended bicycle improvement projects discussed in this chapter are intended to provide increased connectivity between destinations through low-stress facilities that are comfortable for all ages and abilities. The proposed improvements include shared-use paths (Class I), bicycle lanes (Class II) and buffered bike lanes (Class IIB), bicycle routes (Class III), bicycle boulevards (Class IIIB) and separated bikeways (Class IV). The proposed network focuses on providing increased connectivity and safety with particular attention to areas surrounding schools, key community destinations and increased connectivity to BART and other regional destinations.

Based on the needs, opportunities, and challenges identified through the existing conditions analysis, the City developed recommendations through an iterative process with the community and other local stakeholders. This chapter describes recommended bicycle improvement projects and provides additional information describing the recommended infrastructure. The proposed improvement projects serve as a foundation to create successful, well-used, and safe spaces for people to bike and roll.

**The recommendations in this chapter are for planning purposes only. Recommendations may be altered depending on opportunities, constraints, and/or roadway changes. Feasibility determination, final design, accessibility, funding, and implementation of any recommended improvements is the responsibility of the appropriate governing agency, “which may include City of Richmond, BART, Caltrans, Union Pacific Railroad, and others.**

## Bicycle Facility Toolkit

This section includes brief descriptions of the recommended bicycle facility types included in the BPAP. More detailed information and specific design guidance for these facility types is contained in the Design Guidelines technical document in [Appendix B](#). Additional design guidance for Bay Trail facilities can be found in the Bay Trail Design Guidelines and Toolkit available through [MTC's website](#).



*A shared-use path (trail) that is part of the San Francisco Bay.*

### Class I – Shared-use Path

Dedicated paths for walking and bicycling that are completely separated from the roadway.



*A bike lane on 37th Street.*

### Class II – Bicycle Lane

Striped lanes for bicyclists located against the curb or next to a parking lane.



*Buffered bike lane on 37th Street.*

### **Class IIB – Buffered Bicycle Lane**

Bicycle lanes with a striped “buffer” area either between the bicycle lane and the travel lane or between the bicycle lane and parked cars (sometimes in both places).



*Bicycle route markings on Key Boulevard.*

### **Class III – Bicycle Route**

Signed routes for bicyclists where lanes are shared with motorists. Streets are designated as bike routes because they are suitable for sharing with motor vehicles and/or provide better (or needed) connectivity than other streets. Routes are marked with signs and/or shared lane bicycle pavement markings (also known as “sharrows”) to alert motorists to expect to share this roadway with bicyclists. The placement of the sharrow marking delineates the position in the lane where bicyclists are expected to be so they are clear of car door zones and other potential conflict areas.



*Bicycle boulevard pavement markings.*

### **Class IIIB – Bicycle Boulevard**

Bicycle routes on low-speed, low-volume streets that are further enhanced with traffic calming features or other treatments to prioritize bicyclist comfort. Slowing vehicles down and improving intersection safety also makes walking and rolling on these streets a more comfortable and enjoyable experience.

## Bicycle Boulevard Toolkit

Unlike other types of bicycle facilities, bicycle boulevards are unique in a variety of treatments that can be used to achieve a comfortable bike riding experience. There are no specific standards or treatments. There are three primary types of treatments that can be used to create a bicycle boulevard:

- Signs and pavement markings
- Vehicle speed management
- Vehicle volume reduction

As the City looks to implement the bike boulevards recommended in the BPAP, it will determine which set of treatments can be used to enhance safety and comfort. Treatments will vary from simple signage and striping only to more advanced intersection redesigns. It is important to note that the BPAP does not prescribe specific treatments to be used for any of the bicycle boulevards recommended in the plan.

Additional details on the three types of bicycle boulevard treatments can be found in the following pages.



*Bicycle Boulevard pavement markings on Nevin Avenue.*

### Signs and Pavement Markings

#### Pavement Markings

Bicycle boulevards can have unique “BIKE BLVD” pavement markings to reinforce that the street is a shared space for bicycles and vehicles. These pavement markings can also include high-visibility green backing to increase driver visibility and awareness further.

#### Wayfinding Signs

Wayfinding is an essential component of the overall bicycle network (discussed in a subsequent section) but plays an even more significant role on bicycle boulevards. Bicycle boulevards can weave through neighborhoods, increasing the importance of the signs to help users complete their trips on the network. Wayfinding can also raise awareness of the presence of the bicycle boulevard, potentially generating new users.

## Vehicle Speed Management

### Speed Limit Reductions

In some areas, especially around schools, reducing the speed limit below 25 MPH may be a helpful strategy in slowing cars and making bicyclists and pedestrians more comfortable in the corridor.

### Traffic Circle

Neighborhood traffic circles are an alternative intersection treatment to a signal or stop sign, and they can regulate traffic flow while adding a calming element.

### Curb Extensions

This type of improvement extends the curb into the street and improve visibility at intersections, slow vehicular turning speeds, and providing additional, consolidated queueing space. When implemented on streets with bicycle facilities, they should be designed with slots to accommodate the bicycle lane.

### Chicanes

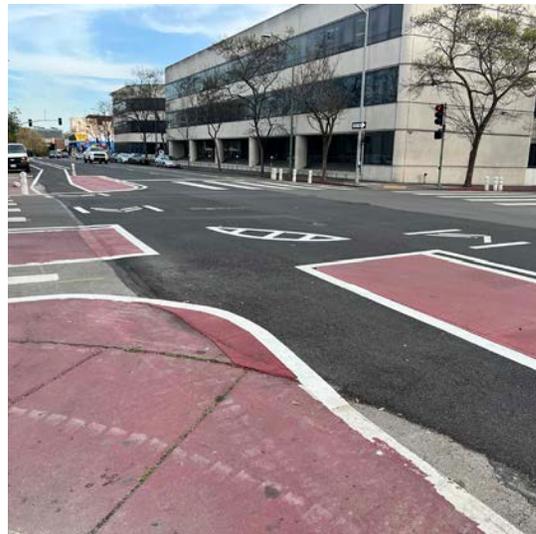
Chicanes add gentle curves to otherwise straight streets. Adding curves to the road can slow car traffic by narrowing the travel lane and force drivers to slow down going around corners. The lane adjustments can be created with striping or offset curb extensions/landscaping.



*Speed reduction along Harbor Way.*



*Traffic circle at Nevin Avenue and 24th Street.*



*A painted curb extension with separated space for bicyclists next to the Lake Merritt BART Station.*



*A chicane on a Berkeley bicycle boulevard.*

### Pinch Points

A pinch point narrows available roadway width with two curb extensions. Limiting the available width creates a narrow road environment where drivers drive slower. Installing trees in these areas can further narrow the profile of the road.

### Speed Bumps/Speed Humps/Speed Cushions

Speed bumps (and similar devices) are undulations that span the width of the roadway and encourage cars to slow down. Speed bumps can be designed with slots for emergency vehicles to use.

### Vehicle Volume Reduction

Partial street closures, diagonal diverters, and median diverters are variations of ways to partially close off streets to vehicles while maintaining pedestrian and bicycle access. These can be useful for forcing drivers to stay on arterial and collector streets, reducing cut-through traffic.

### Class IV Separated Bikeways

Separated bikeways provide a physical vertical barrier between the bicycle space and motor vehicle lanes, including bollards, curbs, or parking.



*A partial pinch point on Nevin Avenue near City Hall.*



*A diagonal diverter at Virginia/15th Street.*



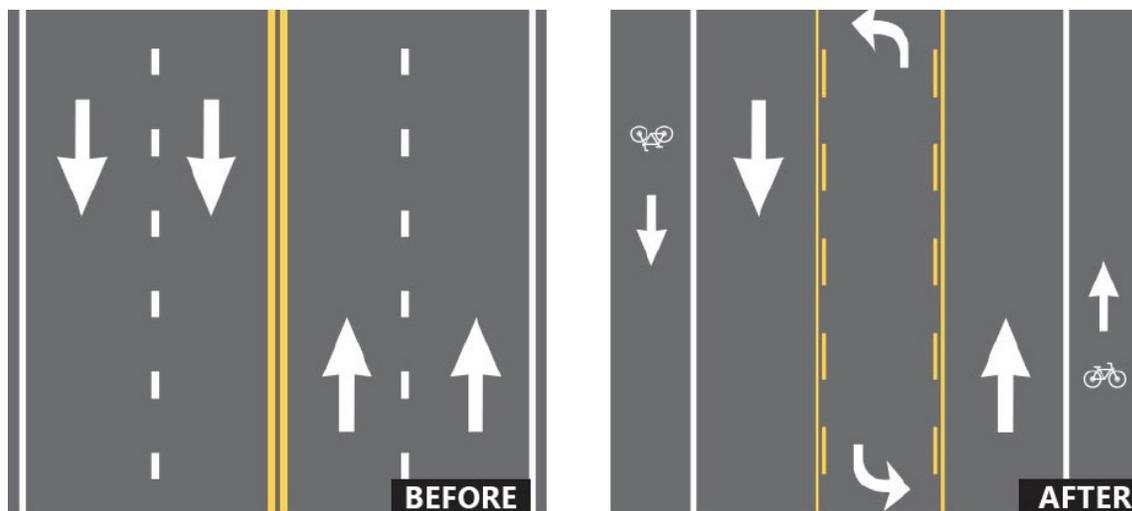
*A two-way separated bikeway on Ohio Avenue.*

## Road Diets

A road diet is generally described as a reconfiguration of travel lanes to balance the space for use by other modes of travel. This usually requires the removal of a travel lane which allows the roadway cross section to be reallocated for other uses such as bike lanes, pedestrian refuge islands, transit uses, and/or parking. These roadway reconfigurations offer many high-level benefits including enhanced safety, mobility, and access for all road users, and create a complete streets environment along the corridor. These benefits include:<sup>2</sup>

- Crash reduction rates between 19-47%
- Reduced vehicle speeds
- Improved mobility and access for all road users
- Better integration of the roadway into surrounding land uses

Conflicts between high-speed through traffic, left-turning vehicles, and other road users that are more prevalent on traditional multilane roadways can lead to relatively higher crash frequencies compared to roadways that have been reconfigured. These reconfigurations allow cities to integrate additional pedestrian and bicycle facilities along these corridors.



*An example of a typical 4-to-3 lane conversion road diet. Image: FHWA.*

Right-sizing roads with excess space, can create a solution that addresses safety concerns and benefits for all road users. These reconfigurations can also be cost-effective when combined with already planned roadway reconstruction or overlay (repaving and restriping) projects. Changing a road's configuration can sometimes impact neighboring streets. During the design phase of a road diet project, project elements can be added to reduce and mitigate impacts on neighboring streets to reduce and control cut-through and other diverted traffic.

Several recommended improvements included in the BPAP will require some form of lane reconfiguration due to existing roadway constraints. Implementation of any road diets will require additional engineering study and community engagement before moving forward. Impacts to local traffic patterns should also be assessed when considering these roadway reconfigurations.

<sup>2</sup> 2. Evaluation of Lane Reduction "Road Diet" Measures on Crashes, FHWA-HRT-10-053, (2010).

## Recommended Improvements

The BPAP recommends over 86 miles of new or upgraded bicycle facilities across Richmond, building on the 114.5 mile network as of 2022.

**Table 05** provides an overview of existing and recommended bicycle facilities by bikeway classification, and **Table 06** (page 36) lists individual projects. Recommendations are shown in **Figures 07 through 09** on the following pages.

These improvements focus on closing existing gaps in Richmond’s network; providing key access to local and regional community destinations (schools, parks, transit, etc.); and

improving the health, equity, and safety of Richmond. A clear pattern emerged around certain hubs of activity, and the BPAP strives to make getting to those destinations safer, more accessible, and more comfortable for people of varying ages and abilities.

Multiple factors were considered in the development of recommended bicycle improvements for a specific corridor. Some of these factors, presence of schools and collision history for example, were considered when recommending facilities that provide increased modal separation

and traffic calming. Other factors like traffic volumes and roadway widths which negatively impact people bicycling, were also considered. Based on an examination of these factors, many of the recommended improvements include Class IIB bicycle boulevards and Class IV separated bikeways. While sometimes more challenging to implement, these two bikeway types provide the greatest comfort and safety benefits for people biking. These recommendations create a connected lower-stress network with facilities that serve people of all ages and abilities.

**Table 05** 2022 Existing and Proposed Bikeways

BIKEWAY CLASS	EXISTING MILES	RECOMMENDED MILES	TOTAL
Class I: Shared-Use Path	49.87	12.76	62.63
Class II: Bicycle Lane	40.74	14.03	48.49
Class IIB: Buffered Bicycle Lane	6.08	0.86	6.94
Class III: Bicycle Route	10.05	7.08	11.76
Class IIIB: Bicycle Boulevard	3.43	31.5	34.93
Class IV: Separated Bikeway	4.36	20.19	24.55
<b>Total</b>	<b>114.53</b>	<b>86.42</b>	<b>189.3</b>

*Note: Total miles account for 11.6 miles of upgraded facilities.*

# PROPOSED BIKEWAYS

## TRAVEL SAFE RICHMOND

### PROPOSED BICYCLE FACILITIES

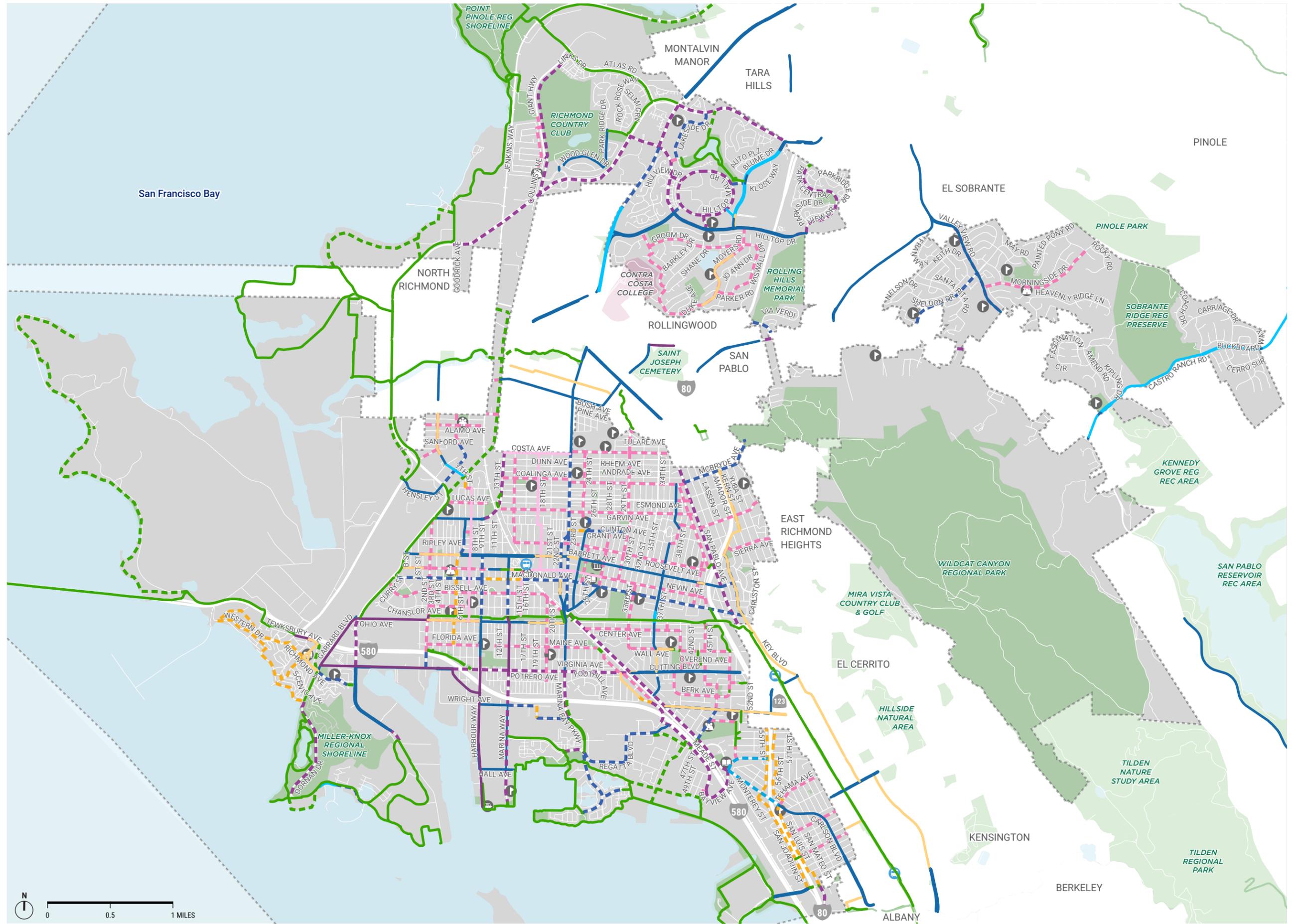
- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway

### EXISTING BICYCLE FACILITIES

- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021100-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 07 Proposed Bicycle Improvements

# PROPOSED BIKEWAYS

## CENTRAL CORE

### PROPOSED BICYCLE FACILITIES

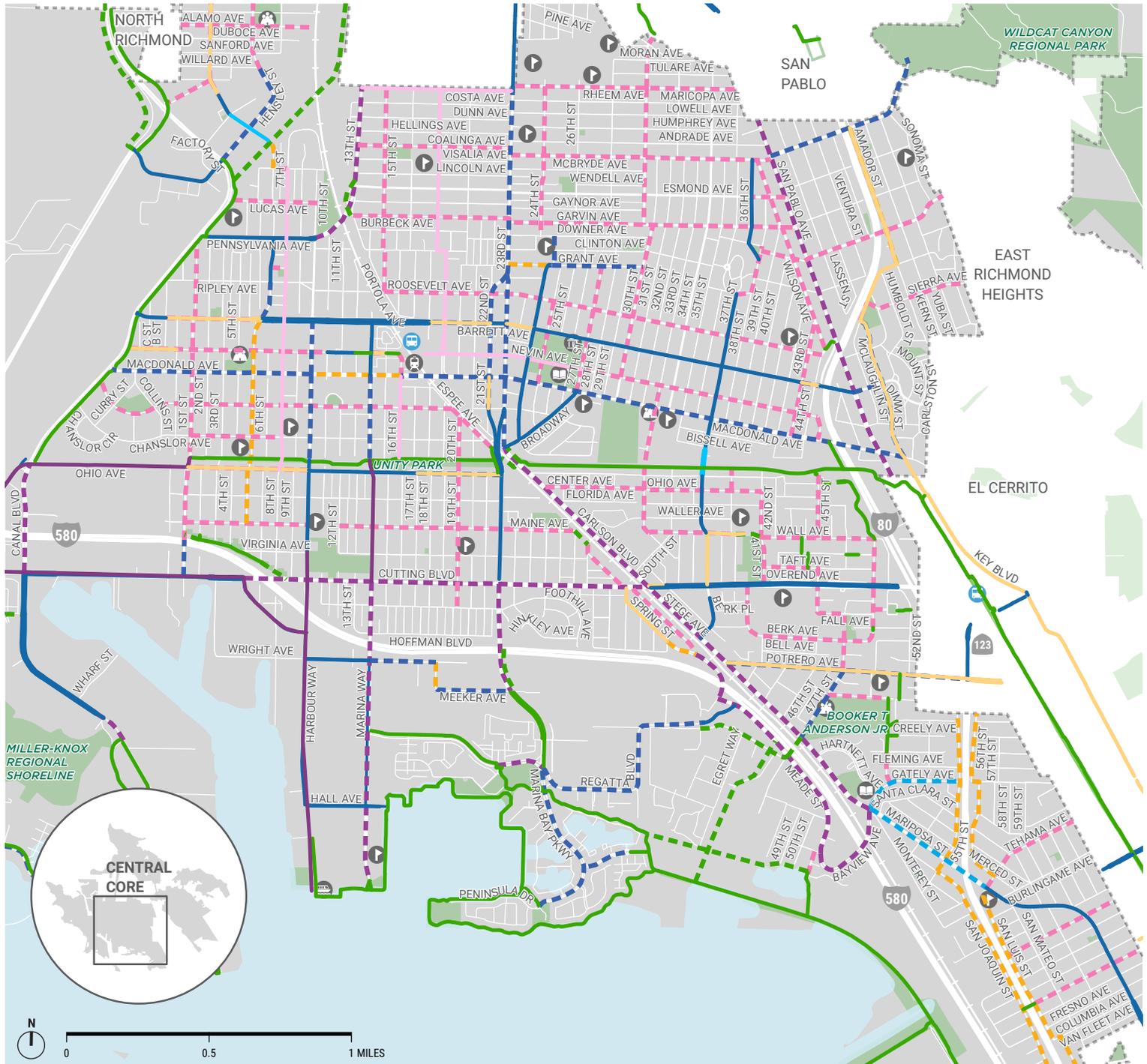
- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway

### EXISTING BICYCLE FACILITIES

- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.



Figure 08 Proposed Bicycle Improvements (Central Core)

# PROPOSED BIKEWAYS

## NORTH RICHMOND

### PROPOSED BICYCLE FACILITIES

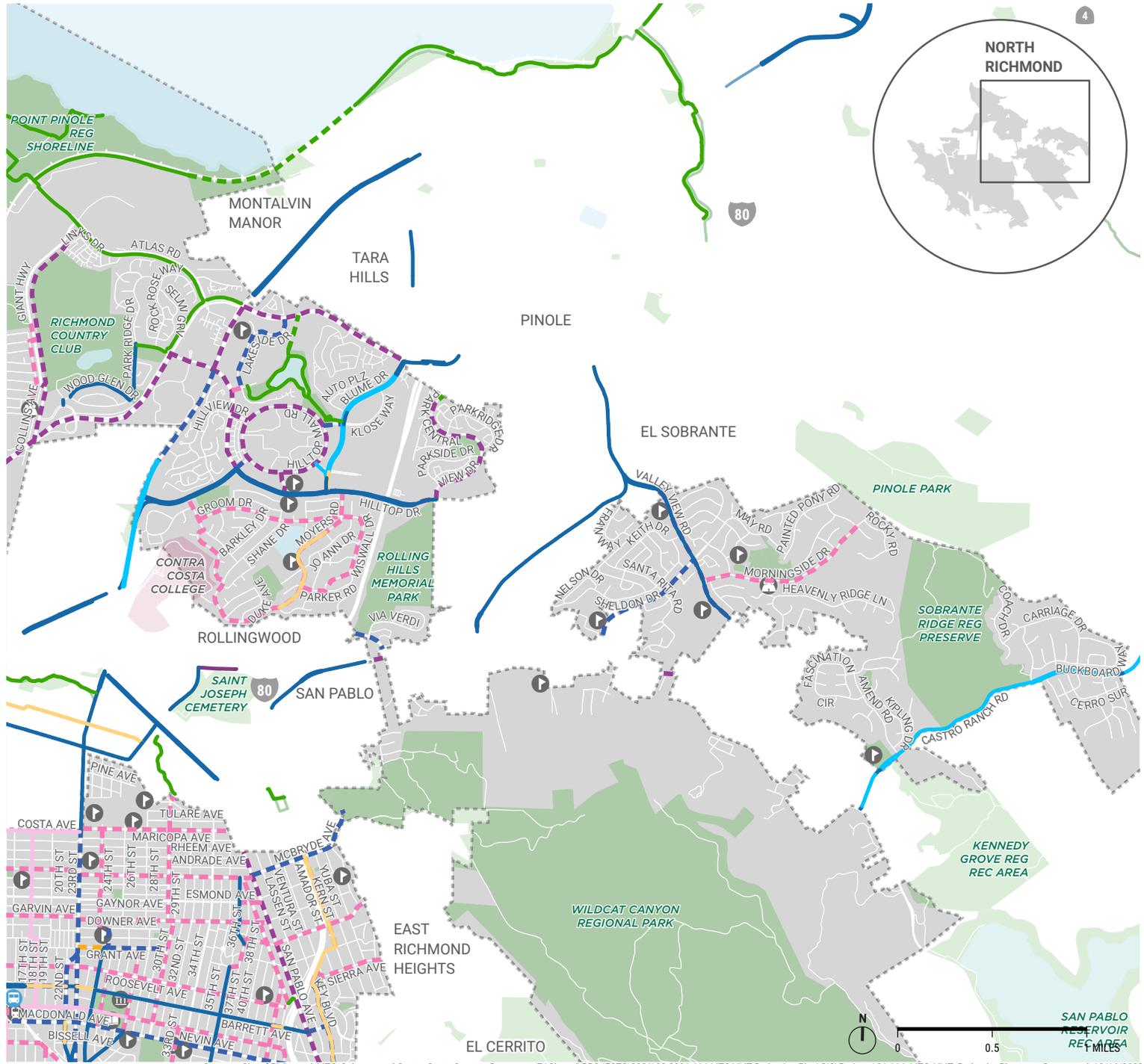
- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway

### EXISTING BICYCLE FACILITIES

- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 09 Proposed Bicycle Improvements (North Richmond)

Table 06 Bicycle Recommendations

STREET	START	END	RECOMMENDED FACILITY	MILES
13th St	Harbour Way	Costa Ave / City Boundary	Class IV Separated Bikeway	0.60
15th St	Roosevelt Ave	Costa Ave	Class IIIB Bicycle Boulevard	0.72
16th St	Macdonald Ave	Livingston Ln	Class IV Separated Bikeway	0.01
16th St	Nevin Plaza	Richmond Greenway	Class IIIB Bicycle Boulevard	0.08
20th St	Espee Ave	Potrero Ave	Class IIIB Bicycle Boulevard	0.67
22nd St	Brooks Ave	Bissell Ave	Class II Bicycle Lane	0.49
23rd St	Brooks Ave	Maricopa Ave	Class II Bicycle Lane	0.66
23rd St	Broadway	Brooks Ave	Class II Bicycle Lane	0.61
23rd St Overcrossing	Richmond Greenway	Richmond Greenway	Class I Shared-Use Path	0.11
24th St	Maricopa Ave	Downer Ave	Class IIIB Bicycle Boulevard	0.53
25th St	Grant Ave	Downer Ave	Class II Bicycle Lane	0.12
25th St	Macdonald Ave	Roosevelt Ave	Class IIIB Bicycle Boulevard	0.30
27th St	Broadway	Grant Ave	Class IIIB Bicycle Boulevard	0.45
29th St	Howard St	Garvin Ave	Class IIIB Bicycle Boulevard	0.66
2nd/ S 2nd St	I-580	Pennsylvania Ave	Class IIIB Bicycle Boulevard	1.05
30th St	Garvin Ave	Nevin Ave	Class IIIB Bicycle Boulevard	0.55
43rd St	Macdonald Ave	Wilson Ave	Class IIIB Bicycle Boulevard	0.42
45th St	Nevin Ave	Macdonald Ave	Class IIIB Bicycle Boulevard	0.08
6th St	Maine Ave	Ripley Ave	Class III Bicycle Route	0.73
7th St	7th St bike lane	Lincoln Ave	Class III Bicycle Route	0.10
7th St	Barrett Ave	Ripley Ave	Class II Bicycle Lane	0.13
Alamo Ave	Cherry St	City Boundary (North Richmond)	Class IIIB Bicycle Boulevard	0.45
Amador Street	McBryde Ave	Clinton Ave	Class III Bicycle Route	0.51
Barrett Ave	19th St	22nd St	Class II Bicycle Lane	0.20

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
Barrett Ave	19th St	Marina Way	Class IV Separated Bikeway	0.21
Barrett Ave	San Pablo Ave	Key Blvd	Class II Bicycle Lane	0.11
Barrett Ave	43rd St	45th St	Class II Bicycle Lane	0.07
Barrett Ave	A St	7th St	Class IIIB Bicycle Boulevard	0.34
Bay Trail - Chevron Realignment (ROW not acquired)	Hensley Ave	North Richmond Border	Class I Shared-Use Path	0.57
Bay Trail - near Meeker Slough	S 51st St Bay Trail Spur	Bay Trail near Bayside Ct	Class I Shared-Use Path	0.58
Bay Trail - North of Landfill Loop Trail	Landfill Loop Trail	Proposed Point Pinole Bay Trail Spur	Class I Shared-Use Path	0.99
Bay Trail Extension: Miller-Knox Regional Shoreline	Existing Bay Trail near Dornan Dr	Existing Bay Trail near Brickyard Cove Rd	Class I Shared-Use Path	0.40
Bay Trail Extension: Point Pinole - San Pablo Bay Regional Shoreline	Existing Bay Trail	Existing Bay Trail	Class I Shared-Use Path	1.02
Bayside Dr	Marina Bay Pkwy	Traffic circle	Class II Bicycle Lane	0.15
Bayview Ave	Seaport Ave	S 55th St	Class IIB Buffered Bicycle Lane	0.36
Bayview Ave	Seaport Ave	S 55th St	Class IV Separated Bikeway	0.36
Berk Ave - S 49th St	Cutting Blvd	Cutting Blvd	Class IIIB Bicycle Boulevard	0.78
Bissell Ave	Richmond Parkway	Espee Ave	Class IIIB Bicycle Boulevard	1.29
BNSF Easement near Railroad Ave (not acquired yet)	Richmond Ave	Washington Ave/Tewksbury Ave	Class I Shared-Use Path	0.23
Brickyard Cove Rd	Dornan Dr	Sandpiper Spit	Class II Bicycle Lane	0.30
Canal Blvd	Cutting Blvd	Seacliff Dr	Class IV Separated Bikeway	0.76
Canal Blvd	Ohio Ave	Cutting Blvd	Class IV Separated Bikeway	0.38
Carlson Blvd	Richmond Greenway	Broadway	Class I Shared-Use Path	0.07
Carlson Blvd	Bayview Ave	Broadway	Class IV Separated Bikeway	1.81
Carlson Blvd	Bayview Ave	Tehama Ave	Class IIB Buffered Bicycle Lane	0.49

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
Center Ave	Carlson Blvd	S 41st St	Class IIIB Bicycle Boulevard	0.76
Central Ave	Jacuzzi St	Pierce St	Class I Shared-Use Path	0.10
Central Ave	Existing Bay Trail	Rydin Rd	Class I Shared-Use Path	0.02
Cerrito Ave - 38th St	37th St	Solano Ave	Class IIIB Bicycle Boulevard	0.22
Chanslor Ave	2nd St	8th St	Class IIIB Bicycle Boulevard	0.32
Chesley Ave	UPRR	BNSF	Class IIIB Bicycle Boulevard	0.10
Clinton Ave	Key Blvd	Sierra Ave	Class IIIB Bicycle Boulevard	0.07
Coalinga Ave	13th St	23rd St	Class IIIB Bicycle Boulevard	0.54
Cutting Blvd	Hoffman Blvd	Carlson Blvd	Class IV Separated Bikeway	1.43
Cypress Ave	S 47th St	Ells St	Class IIIB Bicycle Boulevard	0.21
Doran Dr	Western Dr	Brickyard Cove Rd	Class IV Separated Bikeway	0.87
E Richmond Ave	Gerrard Blvd	Canal Blvd Parking Lot Cut Through	Class II Bicycle Lane	0.27
El Portal Dr	Near I-80	Near San Pablo Dam Rd	Class II Bicycle Lane	0.18
Ells St	Fleming Ave	Bayview Ave	Class IIIB Bicycle Boulevard	0.11
Elm St	7th St	8th St	Class IIIB Bicycle Boulevard	0.05
Esmond Ave	San Pablo Ave	37th St	Class IIIB Bicycle Boulevard	0.12
Espee Ave	Bissell Ave	Trail south of Chanslor Ave	Class IIIB Bicycle Boulevard	0.19
Filbert St	Chesley Ave	Existing Class II	Class IIIB Bicycle Boulevard	0.34
Garvin Ave	Portola Ave	San Pablo Ave	Class IIIB Bicycle Boulevard	1.57
Giant Hwy	Atlas Rd	Griffin Dr	Class IV Separated Bikeway	0.95
Giant Hwy	Collins Ave	Richmond Parkway	Class IV Separated Bikeway	0.33
Golden Gate Ave	Ocean Ave	Washington Ave	Class III Bicycle Route	0.86
Grant Ave	24th St	30th St	Class II Bicycle Lane	0.32
Grant Ave	23rd St	24th St	Class III Bicycle Route	0.14

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
Groom Dr - Wiswall Dr - Parker Rd	Oxford Ave	Movers Rd	Class IIIB Bicycle Boulevard	1.48
Harbour Way	Richmond Greenway	Macdonald Ave	Class II Bicycle Lane	0.31
Harbour Way	Macdonald Ave	Barrett Ave	Class II Bicycle Lane	0.19
Hensley St	Willard Ave	Richmond Parkway	Class II Bicycle Lane	0.40
Hilltop Dr	Richmond Parkway	Robert Miller Dr	Class IV Separated Bikeway	0.84
Hilltop Dr	Robert Miller Dr	Park Central St	Class IV Separated Bikeway	1.11
Hilltop Lake - Richmond Parkway Connector	Hilltop Lake Trail	Richmond Parkway	Class I Shared-Use Path	0.19
Hilltop Mall Rd	Hilltop Mall Rd	Hilltop Mall Rd	Class IV Separated Bikeway	1.28
Hillview Dr	Hilltop Mall Rd	Hilltop Dr	Class IV Separated Bikeway	0.09
Kelsey St	Chesley Ave	Willard Ave	Class IIIB Bicycle Boulevard	0.25
Key Blvd	Macdonald Ave	Clinton Ave	Class II Bicycle Lane	0.51
Klose Way	Hilltop Mall Rd	Blume Dr	Class II Bicycle Lane	0.10
Lakeside Dr	Richmond Parkway	Research Dr	Class II Bicycle Lane	0.54
Lincoln Ave	8th St	7th St	Class IIIB Bicycle Boulevard	0.05
Lucas Ave	Richmond Parkway	Lucas Park	Class IIIB Bicycle Boulevard	0.32
Macdonald Ave	16th St	Key Blvd	Class II Bicycle Lane	1.80
Macdonald Ave	Richmond Parkway	Harbour Way	Class II Bicycle Lane	0.70
Macdonald Ave	Harbour Way	16th St	Class III Bicycle Route	0.32
Maine Ave	S 12th St	S 28th St	Class IIIB Bicycle Boulevard	0.82
Maine Ave	S 2nd St	Harbour Way	Class IIIB Bicycle Boulevard	0.43
Maricopa Ave	23rd St	36th St	Class IIIB Bicycle Boulevard	0.77
Marina Bay Parkway	Regatta Blvd	Peninsula Dr	Class II Bicycle Lane	0.63
Marina Bay Pkwy	Cutting Blvd	Meeker Ave	Class IV Separated Bikeway	0.39

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
Marina Bay Pkwy	I-580	Meeker Ave	Class I Shared-Use Path	0.16
Marina Way	Cutting Blvd	Waterfront / Lucretia Edwards Park	Class IV Separated Bikeway	1.06
Marina Way	Macdonald Ave	Richmond Greenway	Class II Bicycle Lane	0.30
Market Ave	San Pablo city limit	North Richmond city limit	Class III B Bicycle Boulevard	0.07
May Rd	Laurel Ln	Valley View Rd	Class II Bicycle Lane	0.66
McBryde Ave	San Pablo Ave	Wildcat Canyon Parking Lot	Class II Bicycle Lane	0.65
McBryde Ave	23rd St	San Pablo Ave	Class III B Bicycle Boulevard	0.91
McGlothen Way - Phanor Dr - Giant Hwy	Williams Dr	Point Pinole Regional Shoreline Park	Class III B Bicycle Boulevard	0.44
Meade St	Regatta Blvd	Seaport Ave	Class IV Separated Bikeway	0.72
Meeker Ave	S 19th St	Marina Bay Parkway	Class II Bicycle Lane	0.26
Miraflores Greenbelt - Ohio Connection	S 45th St	Miraflores Greenbelt	Class I Shared-Use Path	0.10
Molate Point Bay Trail Extension	Stenmark Dr	Bridge Trail	Class I Shared-Use Path	2.39
Morningside Dr	Valley View Rd	Full Moon Dr/ Thunderhead Ct	Class III B Bicycle Boulevard	0.93
Moyers Rd - Oxford Ave - Birmingham Dr	Hilltop Dr	Hilltop Dr	Class III B Bicycle Boulevard	1.89
N Castro St	Bay Trail	Filbert St	Class III B Bicycle Boulevard	0.17
Nevin Ave	27th St	45th St	Class III B Bicycle Boulevard	0.85
Nevin Ave	Richmond Parkway	8th St	Class III B Bicycle Boulevard	0.54
Nevin Ave	8th St	11th St	Class III B Bicycle Boulevard	0.16
Nevin Ave	Marina Way	15th St	Class III B Bicycle Boulevard	0.05
New Shared-Use Path	Lincoln Ave	Garvin Ave	Class I Shared-Use Path	0.14
New Shared-Use Path	Bay Trail	Meade St	Class I Shared-Use Path	0.58
New Shared-Use Path	S 28th St	S 29th St	Class I Shared-Use Path	0.07

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
New Shared-Use Path	Proposed San Pablo Creek Trail	Richmond Parkway	Class I Shared-Use Path	1.59
Ohio Ave	17th St	23rd St	Class II Bicycle Lane	0.30
Ohio Ave	Harbour Way	2nd St	Class IIIB Bicycle Boulevard	0.42
Park Central St	Hilltop Dr	Park Central Ct	Class IV Separated Bikeway	0.86
Park Central St Shopping Center Access	Park Central Ct	Shopping Center	Class I Shared-Use Path	0.03
Pierce St	Central Ave	Cerrito Creek	Class IV Separated Bikeway	0.23
Plaza Way	S 49th St	S 50th St	Class IIIB Bicycle Boulevard	0.05
Point Pinole Bay Trail spur	Existing Bay Trail/ North Richmond Border	Existing Bay Trail	Class I Shared-Use Path	0.60
Point Richmond Bike Boulevard	Ocean Ave	Garrard Blvd	Class III Bicycle Route	1.17
Point San Pablo Bay Trail extension	Molate Point Bay Trail extension	Point San Pablo	Class I Shared-Use Path	1.63
Potrero Ave	Carlson Blvd	San Pablo Ave (beyond City limit)	Class II Bicycle Lane	0.97
Regatta Blvd	Regatta Blvd Trail	Julia Wood St/Spring St	Class IV Separated Bikeway	0.20
Regatta Blvd	S 32nd St	Robin Dr	Class II Bicycle Lane	0.44
Regatta Blvd	Marina Bay Pkwy	S 32nd St	Class II Bicycle Lane	0.37
Regatta Blvd	Bay Trail / Marina Park & Green	Marina Bay Parkway	Class IV Separated Bikeway	0.17
Regatta Blvd	Spring St	Julia Woods St	Class III Bicycle Route	0.11
Research Dr	Hilltop Dr	Lakeside Dr	Class IIIB Bicycle Boulevard	0.05
Richmond Ave - Canal Blvd connector	Richmond Ave	Canal Blvd	Class I Shared-Use Path	0.06
Richmond Pkwy	Goodrick Ave	Hilltop Dr	Class IV Separated Bikeway	1.76
Richmond Pkwy	San Pablo Ave	Blume Dr	Class IV Separated Bikeway	0.94
Robert Miller Dr	Hilltop Mall Rd	Hilltop Dr	Class II Bicycle Lane	0.08
Robin Dr	Regatta Blvd	Meade St	Class I Shared-Use Path	0.34

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
Roosevelt Ave	Portola Ave	44th St	Class IIIB Bicycle Boulevard	1.56
S 19th St	Wright Ave	Meeker Ave	Class III Bicycle Route	0.10
S 2nd St	I-580	Cutting Blvd	Class II Bicycle Lane	0.13
S 33rd St	Wall Ave	Nevin Ave	Class IIIB Bicycle Boulevard	0.53
S 39th St	Center Ave	Richmond Greenway	Class IIIB Bicycle Boulevard	0.08
S 41st St	Center Ave	Cutting Blvd	Class IIIB Bicycle Boulevard	0.33
S 45th St	Richmond Greenway	Wall Ave	Class IIIB Bicycle Boulevard	0.22
S 47th St	Potrero Ave	Carlson Blvd	Class II Bicycle Lane	0.28
S 47th St - Fall Ave - S 45th St - Overend Ave - JFK Park	Wall Ave	Potrero Ave	Class IIIB Bicycle Boulevard	0.64
S 47th St - I-580 Overpass	Carlson Blvd	Meade St	Class I Shared-Use Path	0.08
S 49th St	Wall Ave	Cutting Blvd	Class IIIB Bicycle Boulevard	0.17
S 51st St	Seaport Ave	Bay Trail	Class IIIB Bicycle Boulevard	0.08
S 55th St	San Joaquin St	Creely Ave / City Boundary	Class III Bicycle Route	0.58
S 56th St	Tehama Ave	Carlos Ave / City Boundary	Class III Bicycle Route	0.64
Sacramento Ave	San Pablo Ave	San Luis St	Class IIIB Bicycle Boulevard	0.41
San Joaquin St	Central Ave	Imperial Ave	Class III Bicycle Route	0.83
San Luis St	Central Ave	Carlson Blvd	Class III Bicycle Route	0.75
San Pablo Ave	Natalie Ct (City Boundary)	Macdonald Ave (City Boundary)	Class IV Separated Bikeway	1.34
San Pablo Ave	Hilltop Dr	La Puerta Dr	Class II Bicycle Lane	0.57
San Pablo Ave	Hilltop Dr	Richmond Pkwy	Class IV Separated Bikeway	0.37
San Pablo Creek Trail	North Richmond Border	San Pablo Border	Class I Shared-Use Path	0.11
San Pablo Dam Rd	Near Martins Ln	Near Martins Ln	Class IV Separated Bikeway	0.06
San Pablo Dam Rd	El Portal Dr	City Limits	Class IV Separated Bikeway	0.07

Table 06 Bicycle Recommendations (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES
Shane Dr	Hilltop Mall Rd	Hilltop Dr	Class IV Separated Bikeway	0.12
Sierra Ave	Clinton Ave	City Limits	Class IIIB Bicycle Boulevard	0.36
Solano Ave	38th Ave	City Boundary	Class IIIB Bicycle Boulevard	0.71
Southside Park Trail extension	S 7th St	Cutting Blvd	Class I Shared-Use Path	0.11
Southside Park Trail west extension	S 3rd St	S 2nd St	Class I Shared-Use Path	0.06
Spring St	S 29th St	Regatta Blvd	Class IIIB Bicycle Boulevard	0.52
Sutter Ave	San Luis St	San Pablo city limit	Class IIIB Bicycle Boulevard	0.42
Tehama Ave	Carlson Blvd	City Boundary (El Cerrito)	Class IIIB Bicycle Boulevard	0.40
Tewksbury Ave	Santa Fe Ave	Washington Ave	Class IV Separated Bikeway	0.10
Valley View Rd	City Boundary (El Sobrante)	Pine Hill Dr	Class IV Separated Bikeway	0.78
Wall Ave	S 41st St	S 49th St	Class IIIB Bicycle Boulevard	0.40
Wall Ave	S 39th St	S 41st St	Class I Shared-Use Path	0.09
Wall Ave	S 33rd St	John F. Kennedy Park	Class IIIB Bicycle Boulevard	0.34
Washington Ave	Casey Dr	Richmond Ave	Class III Bicycle Route	0.25
Wildcat Creek Trail Gap Closure	Existing trail (North Richmond)	Existing trail (near Hubert Park - San Pablo)	Class I Shared-Use Path	0.34
Wilson Ave	McBryde Ave	44th St	Class IIIB Bicycle Boulevard	0.70
Wright Ave	Marina Way	S 19th St	Class II Bicycle Lane	0.24

A person in a dark coat and light shoes is pushing a dark stroller with a child inside. They are walking across a crosswalk on a paved street. The child is looking back over their shoulder. The scene is in black and white with a blue tint.

Chapter

04

# Pedestrian Recommendations

# Pedestrian Recommendations

The pedestrian spot improvement projects recommended in this chapter were developed through an iterative process with the community and partner agencies that included workshops and an online interactive map. This chapter describes the recommended projects and provides information describing the recommended infrastructure. The recommendations in this chapter are intended to serve as a foundation for creating successful, well-used, and safe spaces for people to walk and roll.

## Pedestrian Facilities Toolkit

This section includes brief descriptions of the recommended pedestrian facility types included in the BPAP. More detailed information and specific design guidance for these facility types is contained in the Design Guidelines technical document in [Appendix B](#). Additional design guidance for Bay Trail facilities can be found in the Bay Trail Design Guidelines and Toolkit available through [MTC's website](#).

The pedestrian improvement projects in the BPAP fall into the following general categories:

- Pavement markings
- Pedestrian-actuated beacons
- Street furniture
- Sidewalks, trails, and medians
- Intersection and street design
- Projects that require additional studies

The types of pedestrian facilities described in this section are not meant to provide an exhaustive list of solutions. Exact solutions for each location should be selected based on professional engineering and planning judgment and best practices to maximize safety and pedestrian accessibility

**The recommendations in this chapter are for planning purposes only. Recommendations may be altered depending on opportunities, constraints, and/or roadway changes. Feasibility determination, final design, accessibility, funding, and implementation of any recommended improvements is the responsibility of the appropriate governing agency, which may include City of Richmond, BART, Caltrans, Union Pacific Railroad, and others.**

## Pavement Markings

### Advance Stop & Advance Yield Markings

Advance yield pavement markings, also referred to as “shark’s teeth,” are markings placed on the roadway before a mid-block crosswalk or before a crosswalk at an intersection approach without a signal or stop sign.

Advance stop lines are solid white lines extending across approach lanes, indicating the point behind which vehicles must stop in compliance with a stop sign or some other traffic control device that requires vehicles to stop. Advanced stop lines should be placed in the roadway 20-50 feet before a mid-block crosswalk or 4-30 feet before a crosswalk at an intersection. These can help improve the visibility of pedestrians to people driving.

### Crosswalks

All crosswalk recommendations are subject to a pedestrian needs analysis to determine the safest, most efficient location to install the crosswalk.



*A freshly painted high-visibility crosswalk on Marina Way.*

### High-Visibility Crosswalks

High-Visibility crosswalks are marked with thick bars, drawing additional attention and awareness to the crossing. In school zones, these crossings are yellow instead of the standard white color.

### Decorative Crosswalks

Decorative crosswalks can add a placemaking element to the street while still serving a marked crosswalk’s primary visibility and awareness objectives. Decorative crosswalks can be themed to reflect the surrounding neighborhood or nearby destinations. Decorative crosswalks must meet specific design parameters to remain compliant with state and federal standards; most importantly, they must include white transverse markings around any decorative pavement treatment.



*A decorative crosswalk near the San Leandro BART Station.*



*A raised crosswalk in front of Hayward's Public Library main branch.*

### **Raised Crosswalks**

A raised crosswalk is a modification of a speed table. Speed tables reduce vehicle speeds by elevating the entire wheelbase of a vehicle (unlike a speed bump that raises each axle individually). Speed tables can be designed to include a mid-block raised crosswalk; in these cases, the height of the speed table matches the sidewalk. This treatment can help slow traffic while increasing pedestrian visibility to approaching motorists.



*Signs and pavement markings on the Richmond Parkway Trail.*

### **Trail Markings**

Paved trails can include striping to demarcate separate areas for pedestrians and bicyclists. Especially on crowded trails with high pedestrian usage, encouraging spatial separation can reduce conflicts and improve the efficiency and consistency of travel.

## Pedestrian-Actuated Beacons

### Rectangular Rapid Flashing Beacons

Rectangular Rapid Flashing Beacons (RRFBs) are user-activated flashing lights used at unsignalized intersections or mid-block crossings. These beacons alert motorists to the presence of people in the crosswalk.

### Pedestrian Hybrid Beacons

A pedestrian hybrid beacon (PHB) is a signal designed to increase safety for pedestrians crossing at non-signalized locations on multilane roadways. Thresholds for installation vary based on the posted speed limit, crossing distance, vehicular volumes, and volumes of pedestrian crossings.



*A RRFB across Grand Avenue in Oakland.*



*A newly installed pedestrian hybrid beacon installed as part of the Yellow Brick Road project at Barrett Avenue/8th Street.*

### Scramble Pedestrian Crossings

A scramble pedestrian crossing, also called “exclusive pedestrian phasing” is a pedestrian-only signal phase to allow for people walking at an intersection to walk and cross in any direction or approach. During this exclusive pedestrian phase, all motorists cars have a red light during the scramble and right-turns-on-red are typically prohibited at these intersections. The diagonal pedestrian crossing is often marked at these intersections.



*A scramble pedestrian crossing in Oakland's Chinatown.*

## Street Furniture

### Signage

Signs serve many uses, from prohibiting movements, limiting parking, or providing advance notice of school zones or crosswalks.

### Street Furniture/Amenities

Street furniture includes benches, transit shelters, trash cans, newsstands, and other items within the public right-of-way. Street

furnishings provide important amenities for pedestrians by adding functionality and vitality to the pedestrian realm and add placemaking elements to the street. They announce that pedestrians are welcome and that the street is a comfortable place to be. These amenities provide a functional service to people walking and provide visual detail and interest.

### Pedestrian-Scale Lighting

Pedestrian-scale lighting improves visibility for people walking and driving, particularly at intersections. These lights focus on illuminating the sidewalk, not the roadway. Lighting can be achieved on one light pole (with one light for the road and one for the sidewalk) or on separate poles. Lighting is also an essential consideration along trails.



Street furniture on Nevin Avenue, including benches, tables, trash and recycling cans, and pedestrian lighting.

## Sidewalks, Trails and Medians

### Sidewalks

Sidewalks provide dedicated space for pedestrians to walk. Sidewalks are raised from the roadway, and some have a planting strip for increased separation from the street. Obstructions like utility boxes, signs, and poles can sometimes limit available sidewalk width.

### Shared-Use Paths

Dedicated paths for walking and bicycling completely separated from the roadway. When paved with asphalt or concrete, trails can include markings to encourage the separation of modes.

### Curb Extensions

Curb extensions extend the curb into the street. Curb extensions can provide several valuable traffic calming and safety benefits. They shorten the crossing distance for people walking, provide improved visibility at intersections, make pedestrians more visible to motorists, and provide additional pedestrian queuing space. They can be installed at intersections or mid-block. Curb extensions can be constructed with permanent materials like cement, pavement markings, and bollards.

### Curb Ramps

Curb ramps allow for smooth transitions between the sidewalk and street level. Curb ramps are essential for those with special mobility needs, strollers, and many other users. Ramps must be built to current accessibility standards.



*A curb extension with green, stormwater infrastructure near the Richmond BART Station.*

## Intersection and Street Design

### Intersection Redesign

Intersections are not always symmetrical and can take on confusing designs when multiple streets come together or when two streets come together at acute angles. Design components like curb extensions, painted buffer areas, and medians make intersections more inviting and less stressful for people biking or walking.

### Free-Right Turn Lane/Slip Lane Removal

Free-right turn lanes facilitate increased vehicle throughput and faster turns at intersections at the expense of pedestrian and bicyclist safety and movement.

### Traffic Calming

Traffic calming is the implementation of roadway changes to slow down vehicle traffic. Engineers can consider many tools to slow vehicle traffic, including speed bumps, chicanes, speed feedback signs, and other items. Traffic calming is also an essential component of bicycle boulevards.

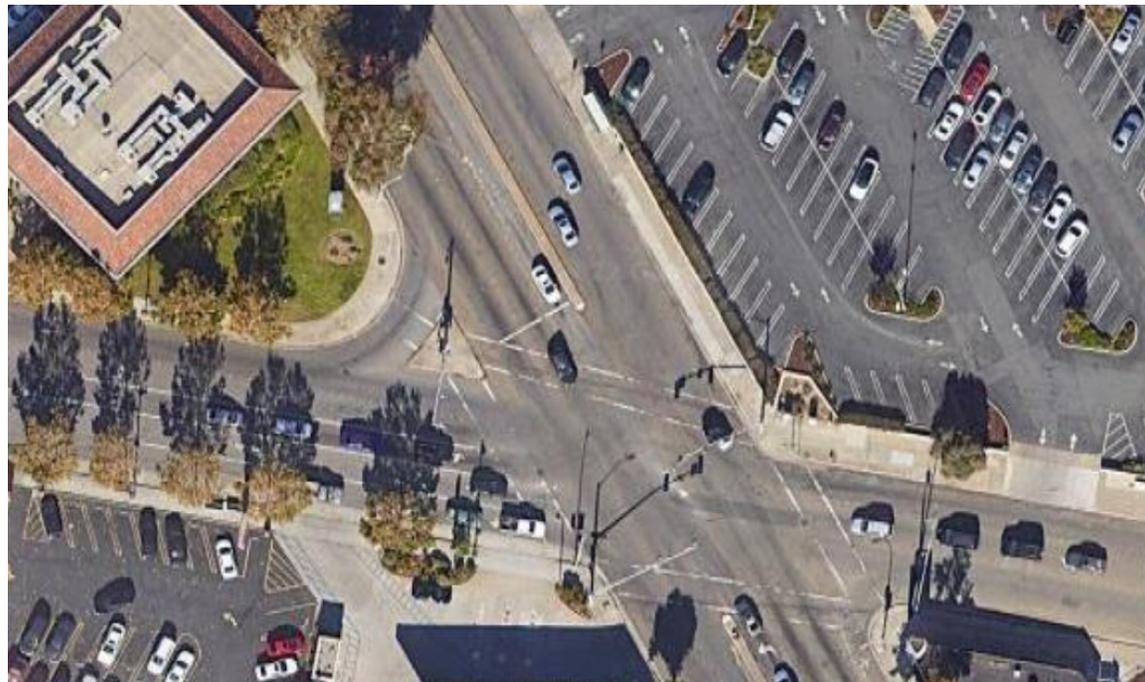
## Projects That Require Additional Studies

### Stop Signs

A stop sign is a traffic control device used to regulate traffic through an intersection, and one or multiple intersection approaches can be stop-controlled. In general, the implementation of stop control is regulated by the CA MUTCD and requires that a technical analysis be conducted.

### Complex Intersections/Situations

While most of the locations examined for the BPAP have recommendations, some will require additional study and traffic analysis to develop recommendations for those locations.



*A free-right turn lane, located at the northwest corner, at the intersection of San Pablo Avenue/ Macdonald Avenue. Image: Google*



*Curb extensions along a bicycle boulevard in Richmond make it easier for people to cross the street.*

## Pedestrian Spot Improvements

The BPAP recommends 111 spot improvements to improve intersection crossing, trail, and sidewalk safety, access, and comfort for people walking, biking, and rolling. **Table 07** (page 56) lists the location, type, and brief description of each recommended improvement project. Project recommendations include recommended improvements

from prior community and corridor plans in addition to new recommendations. The location of each spot improvement can be seen in **Figures 10 through 12** on the following pages. Projects are shown with an ID number that corresponds to the ID column in **Table 07**.

# PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

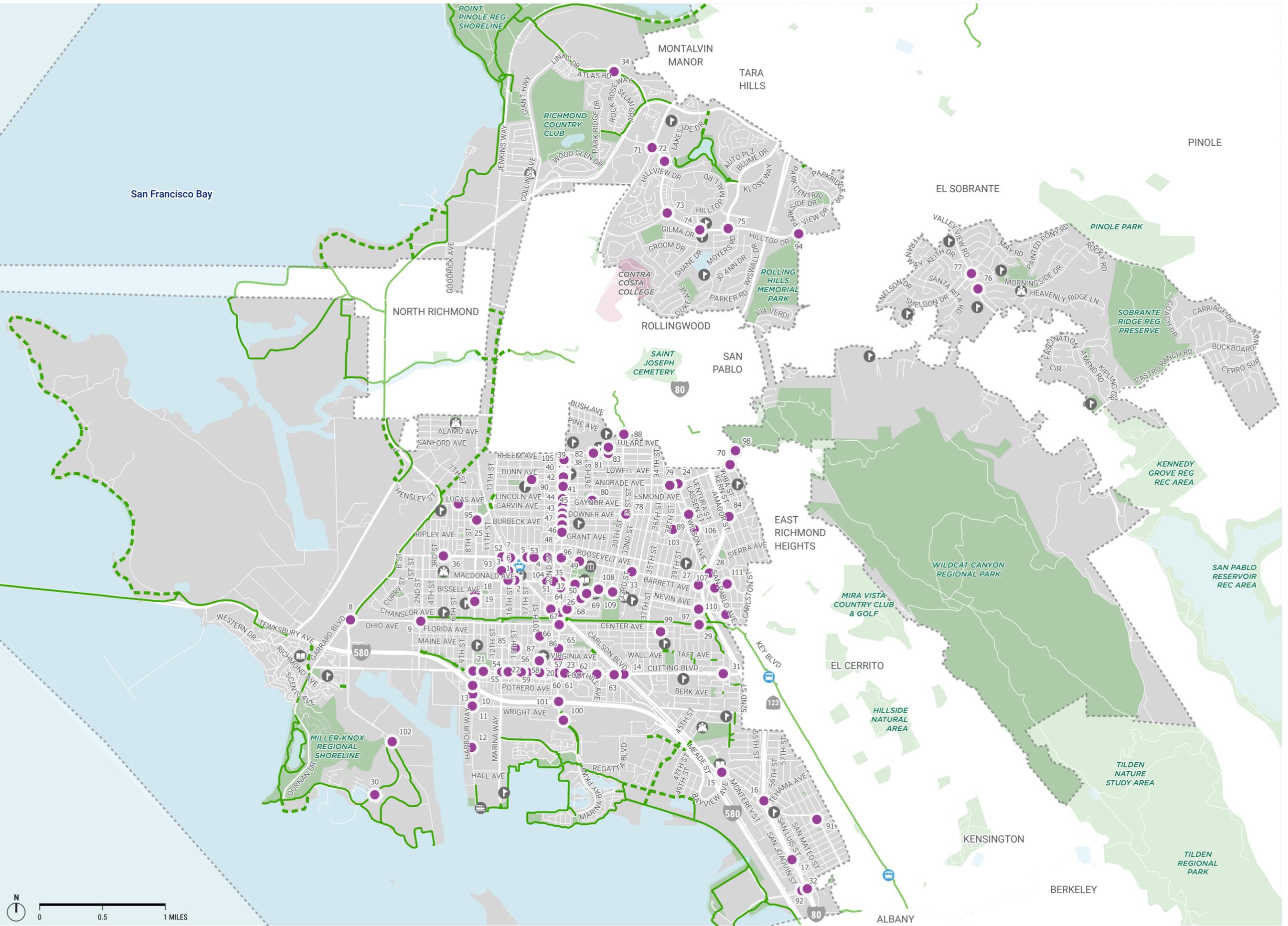
## TRAVEL SAFE RICHMOND

### PROPOSED PEDESTRIAN PROJECTS

- Proposed Spot Improvement
- Proposed Class I Shared-Use Path

### BOUNDARIES + DESTINATIONS

- 🚇 BART Station
- 🚆 Amtrak Station
- 🚢 Ferry Terminal
- 🎓 School
- 🏛️ City Hall
- 📖 Library
- 🏠 Community Center
- 🌳 Park
- 🎓 Contra Costa College
- ⬢ City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021100-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 10 Proposed Spot Improvements

# PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

## CENTRAL CORE

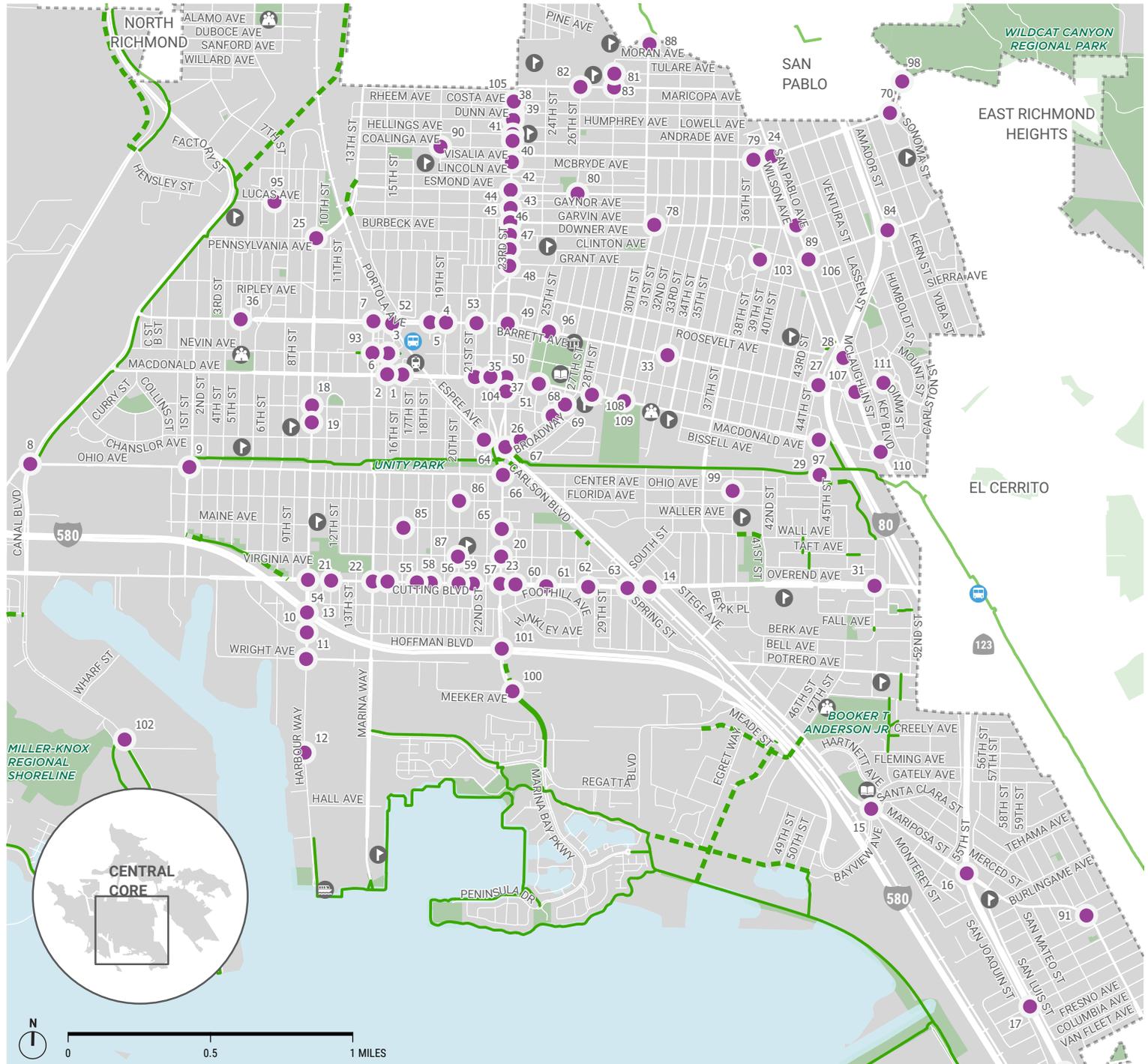
TRAVEL SAFE RICHMOND

### PROPOSED PEDESTRIAN PROJECTS

- Proposed Spot Improvement
- Proposed Class I Shared-Use Path

### BOUNDARIES + DESTINATIONS

-  BART Station
-  Amtrak Station
-  Ferry Terminal
-  School
-  City Hall
-  Library
-  Community Center
-  Park
-  Contra Costa College
-  City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.



Figure 11 Proposed Spot Improvements (Central Core)

# PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

NORTH RICHMOND

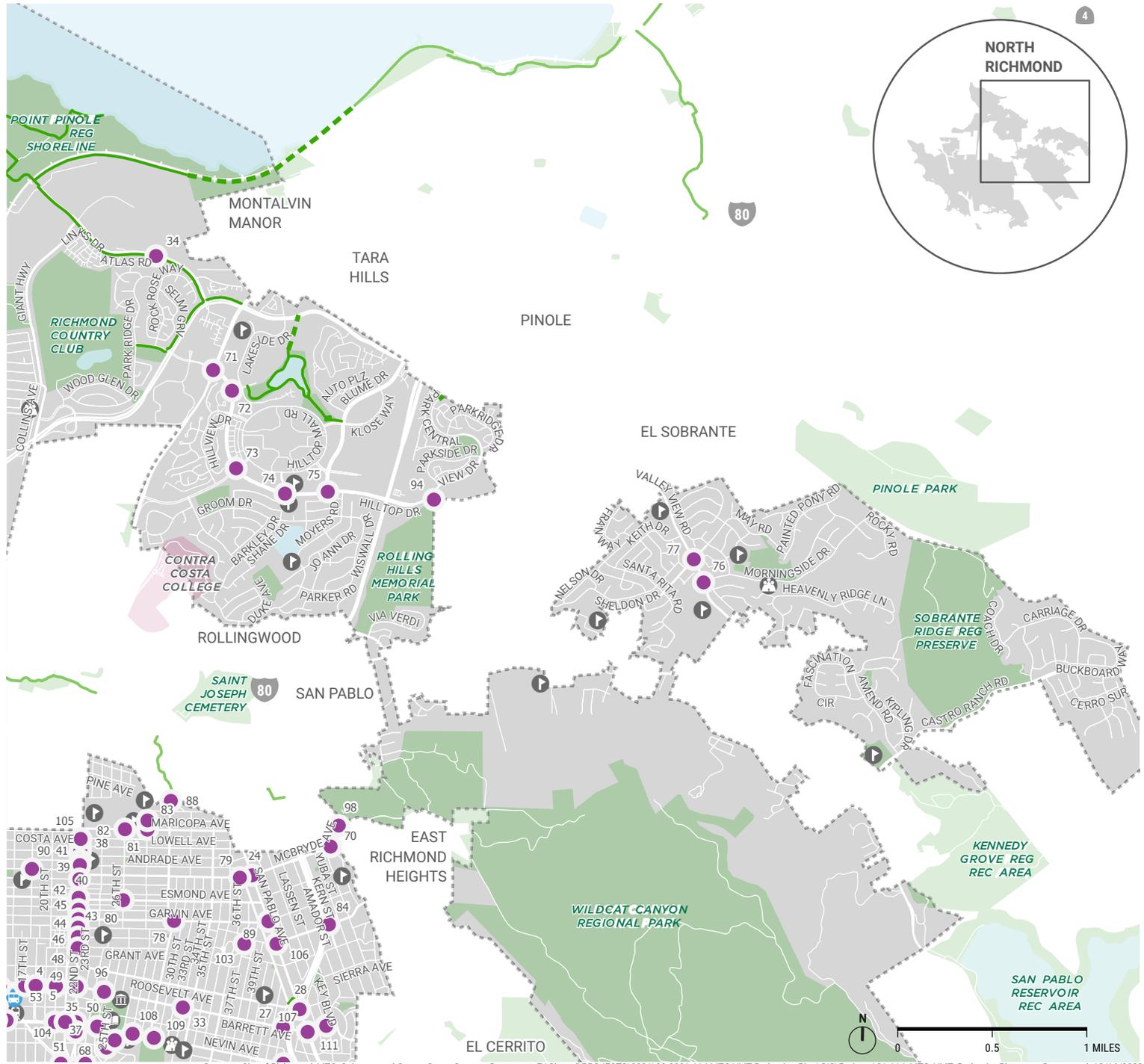
TRAVEL SAFE RICHMOND

## PROPOSED PEDESTRIAN PROJECTS

- Proposed Spot Improvement
- Proposed Class I Shared-Use Path

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 12 Proposed Spot Improvements (North Richmond)

Table 07 Spot Improvement Recommendations

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
1	Macdonald Ave	16th St	Intersection Upgrade	Consider scramble phase or otherwise don't allow permitted left turns to conflict with pedestrians in the crosswalk. Create LPI (leading pedestrian interval). Consider parklet on southwest corner.
2	Macdonald Ave	15th St	Crossing Improvement	Consider constructing a raised intersection or raised crosswalk at the eastern approach. Construct curb extensions at all four corners. Install high-visibility crosswalks at the eastern and western approaches on top of decorative paving.
3	Nevin Ave	15th St	Crossing Improvement	Consider constructing a median refuge or traffic circle to accommodate direct pedestrian path of travel.
4	Barrett Ave	18th St	Crossing Improvement	Install the north, south, and west crosswalk legs as high-visibility. Install an RRFB or PHB for Barrett crossings (based on warrants). Add appropriate signs and advance pavement markings based on selected actuated crossing beacon.
5	Barrett Ave	19th St	Crossing Improvement	Stripe fourth crosswalk leg and upgrade traffic signal to include pedestrian countdown.
6	15th St	Nevin Ave	Bicycle Access	Provide a ramp to allow bicycle access to/from plaza.
7	Marina Way	Barrett Ave	Intersection Upgrade	Install a curb extension at the northwest and southwest corners. Provide a leading pedestrian interval and adjust pedestrian phase length to provide sufficient crossing times. Realign the southern crosswalk several feet south and install high-visibility crosswalks at the north and eastern approaches. Consider installing bicycle lane conflict markings and a two-stage bike turn box for NB-WB bike movements.
8	Ohio Ave	Canal Blvd	Crossing Improvement	Refresh existing intersection markings, upgrade remaining crosswalks to high-visibility and provide a leading pedestrian interval.
9	Ohio Ave	S 2nd St	Crossing Improvement	Potential for bike and pedestrian intersection improvements.
10	Hoffman Blvd	Harbour Way	Crossing Improvement	Install high-visibility crosswalks and install curb extensions.
11	Wright Ave	Harbour Way	Crossing Improvement	Implement ADA accessible accommodations throughout the intersection, sidewalk and curbs.
12	1000' north of Hall Ave	Harbour Way	Crossing Improvement	Coordinate with railroad operator to install pedestrian railroad crossing gates, Implement ADA accessible accommodations throughout the intersection, sidewalk, and curbs.
13	Harbour Way	I-580 On and Off Ramps	Intersection Upgrade	Coordinate with Caltrans install high-visibility crosswalks and curb extensions at all corners.
14	Carlson Blvd	Cutting Blvd	Intersection Upgrade	Construct intersection improvements including: formalized curb extensions, widened sidewalk, and additional sidewalks.
15	Carlson Blvd	Bayview Ave	Intersection Upgrade	Install intersection improvements including curb extensions and a median nose.

Table 07 Spot Improvement Recommendations (Continued)

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
16	Carlson Blvd	I-80 Undercrossing	Intersection Upgrade	Construct intersection improvements including: median refuge islands and curb extensions.
17	Sacramento Ave	San Luis St	Crossing Improvement	Path crossing improvements: upgrade crosswalk to high-visibility and install advance yield markings. Consider installing RRFB.
18	Harbour Way	Bissell Ave	Crossing Improvement	Install curb extensions at all corners and restripe crosswalks as high-visibility.
19	Harbour Way	300' north of Chanslor Ave	Crossing Improvement	Install a high-visibility mid-block crosswalk with a median refuge island.
20	S 23rd St	Virginia Ave	Crossing Improvement	Consider installation of a pedestrian refuge island and install pedestrian-scale lighting.
21	Harbour Way	Cutting Blvd	Crossing Improvement	Install curb extensions, directional ramps and high-visibility crosswalks, and median crossing islands.
22	Marina Way	Cutting Blvd	Crossing Improvement	Install curb extensions, directional ramps and high-visibility crosswalks and median crossing islands.
23	S 23rd St	Cutting Blvd	Crossing Improvement	Restripe crosswalks as high-visibility crosswalks. Install curb extensions at all corners with directional ramps. Construct median crossing islands.
24	San Pablo Ave	McBryde Ave	Intersection Upgrade	Install curb extensions and ramps, and construct curb extensions so that streets intersect at right angles. Upgrade all crosswalk to high-visibility crosswalks.
25	Harbour Way	Pennsylvania Ave/13th St	Intersection Upgrade	Install high-visibility crosswalks, and construct medians/channelized islands/curb extensions and advance stop bars. Consider slip lane removal.
26	Broadway	23rd St	Intersection Upgrade	Widen, lengthen, and channelize median islands. Restripe crosswalks as high-visibility crosswalks.
27	Barrett Ave	I-80 Undercrossing	Intersection Upgrade	Coordinate with Caltrans to consider reconfiguring the through and turn lanes around the interchange. Coordinate with Caltrans to remove/trim vegetation around the off-ramp that blocks the visibility of pedestrians in the north crosswalk. Install a high-visibility crosswalk across the eastern approach.
28	San Pablo Ave	Roosevelt Ave	Intersection Upgrade	Install curb extensions to tighten turn radii, and shorten crossing distances, Coordinate with Caltrans to study removing double right turn lane from San Pablo onto I-80 on-ramp.
29	S 45th St	Richmond Greenway Trail connection	Trail Access	Improve connections to trail connector ramp from 45th St
30	Seacliff Dr	Seaview Dr	Crossing Improvement	LRSP high-injury intersection. Install crosswalk on northeast leg of intersection to connect to Class I path. Consider installing yield markings and radar speed feedback signs.
31	S 49th St	Cutting Blvd	Lighting	LRSP high-injury intersection,: install intersection lighting.

Table 07 Spot Improvement Recommendations (Continued)

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
32	San Joaquin St	Central Ave	Crossing Improvement	LRSP high-injury intersection: construct bulb outs and install advanced warning signs.
33	33rd St	Barrett Ave	Crossing Improvement	LRSP high-injury intersection. Construct curb extensions and install advanced warning signs and markings.
34	Atlas Rd	Oakmont Dr	Crossing Improvement	LRSP high-injury intersection. Construct curb extensions and install advanced warning signs and markings, Consider installing an RRFB or PHB for the Atlas Road crossing.
35	Macdonald Ave	21st St	Crossing Improvement	LRSP high-injury intersection. Upgrade all crosswalks to high-visibility. Consider installing an RRFB or PHB. Construct curb extensions at all corners.
36	5th St	Barrett Ave	Crossing Improvement	LRSP high-injury intersection. Upgrade crosswalks to high-visibility. Consider installing an RRFB or PHB. Construct curb extensions.
37	25th St	Macdonald Ave	Crossing Improvement	LRSP high-injury intersection: Upgrade all crosswalks to high-visibility. Consider installing RRFB or PHB. Construct curb extensions at all corners.
38	23rd St	Lowell Ave	Crossing Improvement	Install a high-visibility crosswalk across the Lowell Ave approach. Upgrade curb ramps to current ADA standards.
39	"23rd St	Dunn Ave	Crossing Improvement	Construct median refuge island and install an RRFB.
40	23rd St	Hellings Ave	Crossing Improvement	Install high-visibility crosswalks and install an RRFB for the 23rd Street crossing.
41	23rd St	Andrade Ave	Crossing Improvement	Construct median refuge island and install RRFB.
42	23rd St	Visalia Ave	Crossing Improvement	Install a new high-visibility crosswalk across 23rd Street. Install an RRFB at the crossing.
43	23rd St	Esmond Ave	Crossing Improvement	Construct median refuge island and install an RRFB.
44	23rd St	Gaynor Ave	Crossing Improvement	"Install high-visibility crosswalks and an RRFB for the crossing of 23rd.
45	23rd St	Garvin Ave	Crossing Improvement	Improve accessibility features (push buttons, curb ramps, etc.) at all corners (more details in the CSSA). Install curb extensions at all corners and crosswalk landings. Upgrade crosswalks to high-visibility.
46	23rd St	Downer Ave	Crossing Improvement	Install a new high-visibility crosswalk across 23rd Street with an RRFB.
47	23rd St	Clinton Ave	Crossing Improvement	Construct a median refuge island and install an RRFB for the 23rd crossing.
48	23rd St	Grant Ave	Crossing Improvement	Install high-visibility crosswalks at all approaches.

Table 07 Spot Improvement Recommendations (Continued)

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
49	23rd St	Barrett Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Install bicycle boxes at the 23rd Street approaches. Install curb extensions at both western corners.
50	23rd St	Macdonald Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Install bicycle boxes at the 23rd Street approaches. Install curb extensions at both western four corners.
51	23rd St	Exchange Pl	Crossing Improvement	Construct a median refuge island and install an RRFB for a crossing of 23rd Street.
52	Barrett Ave	BART Tracks	Sidewalk	Widen sidewalk on northern side through underpass (Requires road diet)
53	Barrett Ave	21st St	Crossing Improvement	Install a new high-visibility crosswalk at the western approach.
54	Cutting Blvd	S 12th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.
55	Cutting Blvd	S 15th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.
56	Cutting Blvd	S 18th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.
57	Cutting Blvd	S 21st St	Crossing Improvement	Upgrade all crosswalks to high-visibility.
58	Cutting Blvd	S 17th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.
59	Cutting Blvd	20th St	Crossing Improvement	Restripe the existing high-visibility crosswalks.
60	Cutting Blvd	S 24th St	Crossing Improvement	Construct a pedestrian refuge island; and install RRFB/PHB.
61	Cutting Blvd	S 26th St	Crossing Improvement	Construct pedestrian refuge island with an RRFB/PHB.
62	Cutting Blvd	S 29th St	Crossing Improvement	Construct pedestrian refuge island and install RRFB/PHB.
63	Cutting Blvd	S 31st St	Crossing Improvement	Construct a pedestrian refuge island and install an RRFB/PHB.
64	Chanslor Ave	Espee Ave	Crossing Improvement	Install curb extensions at the two western corners to square up the intersection.
65	Maine Ave	S 23rd St	Crossing Improvement	Install high-visibility crosswalks at all approaches and construct curb extensions at all corners.
66	Ohio Ave	S 23rd St	Crossing Improvement	Construct curb extensions at all corners.
67	Broadway	24th St	Crossing Improvement	Construct curb extensions at all corners.
68	Broadway	Bissell Ave	Crossing Improvement	Install curb extensions at the northern and southwest corners to square up the intersection. Realign and upgrade all crosswalks to high-visibility crosswalks. Install an RRFB for the Broadway crossing.

Table 07 Spot Improvement Recommendations (Continued)

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
69	Broadway	26th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.
70	McBryde Ave	Sonoma St	Crossing Improvement	Construct curb extensions.
71	Hilltop Dr	San Pablo Ave	Crossing Improvement	Construct curb extensions.
72	Hilltop Dr	Research Dr	Crossing Improvement	Construct curb extensions at all corners.
73	Hilltop Dr	Robert Miller Dr	Intersection Upgrade	Study removal free-right turn lanes.
74	Hilltop Dr	Shane Dr	Intersection Upgrade	Study removal of free-right turn lanes.
75	Hilltop Dr	Blumer Dr	Intersection Upgrade	Study removal of free-right turn lane.
76	Morningside Dr	Valley View Rd	Crossing Improvement	Install high-visibility crosswalks.
77	May Rd	Valley View Rd	Crossing Improvement	Upgrade crosswalks to high-visibility and install curb extensions.
78	Garvin Ave	30th St	Crossing Improvement	Install high-visibility crosswalks and an RRFB for a crossing of Gavin Avenue.
79	McBryde Ave	37th St	Crossing Improvement	Install curb extensions at all corners.
80	Esmond Ave	26th St	Crossing Improvement	Install high-visibility crosswalks.
81	Maricopa Ave	28th St	Crossing Improvement	Install high-visibility crosswalks.
82	Maricopa Ave	26th St	Crossing Improvement	Install high-visibility crosswalks.
83	Tulare Ave	28th St	Crossing Improvement	Install high-visibility crosswalks.
84	Solano Ave	Amador St	Crossing Improvement	Install curb extensions at all corners.
85	Maine Ave	S 16th St	Bicycle Access	Install bicycle cut through in traffic divertor.
86	Florida Ave	S 20th St	Bicycle Access	Install bicycle cut through in traffic divertor.
87	Virginia Ave	S 20th Street	Bicycle Access	Install a bicycle cut through in traffic divertor.

Table 07 Spot Improvement Recommendations (Continued)

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
88	29th St/Vale Rd	Howard St/ Salesian Ave	Crossing Improvement	Study locations for a marked crossing of 29th/Vale, including one block south at Moran Avenue. Coordinate with City of San Pablo as necessary.
89	Garvin Ave	San Pablo Ave	Crossing Improvement	Install high-visibility crosswalks at all intersection approaches. Provide a leading pedestrian interval with all crossing phases. Install bicycle conflict markings.
90	Coalinga Ave	18th St	Crossing Improvement	Upgrade the two existing crosswalks to high-visibility and install high-visibility crosswalks at the northern and eastern approaches. Install advance stop markings at all approaches. Study intersection traffic control options with the design of the Coalinga Avenue bicycle boulevard.
91	Sutter Ave	Carlson Blvd	Crossing Improvement	SRTCP: Upgrade the existing southern crosswalk to high-visibility and install advance yield markings. Install transverse crosswalks at the eastern and western approaches with advance stop markings. Install an RRFB for the Carlson (southern) crosswalk. Consider building a refuge islands from the existing median.
92	Central Ave	I-80	Crossing Improvement	Coordinate with Caltrans to upgrade all crosswalks to high-visibility crosswalks and provide leading pedestrian intervals for all crossing phases. Extend bicycle conflict markings on Central through the Jacuzzi intersection and interchange. Long term, construct curb extensions to tighten radii and square up approaches.
93	Nevin Ave	Marina Way	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks and provide a leading pedestrian interval for call crossing phases. Long term, consider converting the intersection to a raised intersection.
94	Park Central St	Hilltop Dr	Crossing Improvement	Study intersection design changes to improve pedestrian crossings and accessibility. Improvements should include high-visibility crosswalks and curb extensions. Coordinate with property owners and other jurisdictions as required.
95	Lucas Ave	7th St	Crossing Improvement	Upgrade the two existing crosswalks to high-visibility and install high-visibility crosswalks at the northern and eastern approaches. Build out the northeast corner to square up the intersection. Construct curb extensions at all corners.
96	Barrett Ave	25th St	Crossing Improvement	Upgrade the three existing crosswalks to high-visibility crosswalks and provide a leading pedestrian interval for all crossing phases. Install bicycle conflict markings through the intersection and consider other intersection treatments like bicycle boxes.
97	Macdonald Ave	45th St	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks and install advance yield markings. Install an RRFB for the Macdonald crosswalks. On the south side of the street, widen the sidewalk and provide a connection to the "Target Path."
98	McBryde Ave/Park Ave	Marin Ave	Crossing Improvement	Study intersection redesign options to improve driver and pedestrian visibility at all intersection approaches. Study should look at crossing, visibility/site lines, and intersection control changes.
99	Center Ave	S 39th St	Wayfinding	Add wayfinding signs directing people walking and biking to the Richmond Greenway trailhead off of 39th Street.

Table 07 Spot Improvement Recommendations (Continued)

ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION
100	Meeker Ave	Marina Bay Pkwy	Crossing Improvement	Install a leading pedestrian interval for all crossing phases. Study removal of the free-right turn lane from the northwest corner. If removed, realign the west crosswalk to be parallel to Marina Bay Parkway. Due to the asymmetrical intersection and challenging site lines, consider providing a protected turn phase for northbound left traffic.
101	I-580	Marina Bay Pkwy	Crossing Improvement	Coordinate with Caltrans to upgrade all crosswalks to high-visibility. At signalized crossings, provide a leading pedestrian interval for all crossing phases. At uncontrolled crossings, install RRFBs.
102	Sea Cliff Dr	Canal Blvd	Crossing Improvement	Trim vegetation around stop sign to improve visibility. Consider adding street lighting to this intersection. Upgrade the existing crosswalk to high-visibility.  Coordinate with the Port to trim vegetation along Sea Cliff Drive.
103	38th St	Boyd Ave/ Solano Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Install advance yield/stop marks where appropriate. Long term, study additional park access improvements include converting Boyd to one-way, curb extensions, and other traffic calming measures.
104	22nd St	Macdonald Ave	Crossing Improvement	Install curb extensions at the northwest and northeast corners. Install a pedestrian count display at the southwest corner. When next repaved, reduce the intersection's crown and conform asphalt to the gutter pan.
105	23rd St	Rheem Ave	Crossing Improvement	Upgrade all curb ramps to current best practices; specifically, replace the southwest corner ramp with a "parallel" ramp and "centered" ramps at the two eastern corners. Adjust pedestrian signal heads as needed. Provide a leading pedestrian interval for all crossing phases.
106	Solano Ave	San Pablo Ave	Crossing Improvement	Refresh all crosswalks. Provide a leading pedestrian interval for all crossing phases. Construct curb extensions for the San Pablo crossings.
107	Barrett Ave	San Pablo Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Mark a high-visibility crosswalk across the northern approach. Construct transit-friendly curb extensions at all four corners. Install bicycle detection.
108	Macdonald Ave	28th St	Crossing Improvement	Upgrade the existing crosswalk to high-visibility and install advance yield markings and an RRFB. Construct curb extensions for the Macdonald crosswalk.
109	Macdonald Ave	Between 30th and 31st St	Crossing Improvement	Refresh the existing midblock crosswalk, install advance yield markings, and an RRFB. Construct curb extensions for the Macdonald crosswalk.
110	Macdonald Ave	San Pablo Ave	Intersection Upgrade	Study removal of the free-right turn lane and options to straighten crosswalks. Upgrade all crosswalks to high-visibility and provide a leading pedestrian interval for all crossing phases.
111	Barrett Ave	Key Blvd	Crossing Improvement	Construct curb extensions (transit-friendly), install advance yield markings, and install an RRFB for the Barrett Avenue crossings.

Chapter  
**05**

# Implementation



# Implementation

This chapter outlines the potential next steps to move the recommended bicycle and pedestrian improvement projects in the BPAP toward implementation. The recommended projects were prioritized to help the City determine which project (or groups of projects) to implement first. This chapter also provides information on funding sources (i.e., competitive grants and formulaic funding opportunities) that the City and partner agencies can use to design and build projects. The chapter also provides a summary of bicycle and pedestrian facility maintenance policies that Richmond will strive to follow to maintain a state of good repair and improve safety. The “Quick-Build” section describes how some projects may be implemented using a more streamlined and cost-effective implementation strategy. Lastly, the chapter describes some of the potential next steps that should be considered after adoption of the BPAP. It also discusses aspects of the implementation process that influence project development like funding, staff time, and multijurisdictional coordination.

## Project Prioritization

The approach to enhancing and expanding Richmond’s active transportation network must consider what is realistic given historical and anticipated funding. It should

also provide the City with the flexibility to respond to changing conditions and project opportunities that may arise. The prioritization of proposed bicycle and pedestrian improvement helps formulate a strategic list to guide the BPAP’s implementation. Over time as development occurs or other changes to land uses and the City’s transportation network take place, the prioritization methodology in this chapter can be used to reevaluate remaining projects and continue pursuing the BPAP’s implementation. For example, an opportunity-priority spot improvement may be completed ahead of a high-priority corridor project due to immediate funding opportunities as part of a redevelopment or larger project. Similarly, a high-priority project may require additional study and funding, extending the time it takes to implement. Prioritization results should be considered flexible concepts that serve as project selection guidelines.

### Prioritization Methodology

The recommended bicycle and pedestrian improvement projects were evaluated using four overarching criteria. Each evaluation criterion was given a normalized score as listed in **Table 08**: the higher the number, the higher ranking an individual project received based on the criteria. The scores were combined for each corridor and

spot improvement; each project has a Quantitative Corridor Score ranging from 0–100, with 100 being the highest ranked. **Table 08** outlines the criteria and provides details about each input of the prioritization score. Projects were scored based on four criteria:

- Safety
- Health and Equity
- Connectivity
- Community Support

The Safety and Health and Equity criteria were awarded up to 25 points each. Conversely, Connectivity was awarded up to 35 points, and Community Support was worth up to 15 points. Connectivity was weighted slightly higher than Safety and Health and Equity, to emphasize a focus on providing safe connections to community destinations including schools, parks, trails, and transit hubs.

Following score calculations, the projects were sorted into high, medium, and opportunity-priority categories based on the distribution of scores. Ideally, the City would like to implement high-priority projects by 2025, medium-priority projects by 2027, and opportunity projects by 2028 or when funding and other opportunities like repaving or development projects occur.

Table 08 Prioritization Criteria

	DEFINITION	DATA USED	SCORING	POINTS AVAILABLE
<b>Safety</b>	A bicycle or pedestrian collision occurred at the project intersection or along the identified project segment.	Collision Data (TIMS 2015-2019)	Weighted Density Based on Severity	25
<b>Health and Equity</b>	The project improves the bicycle and pedestrian network networks in areas with a high density of residents experiencing health risks, low income, and low vehicle access.	<ul style="list-style-type: none"> <li>Longitudinal Employer-Household Dynamics Data (Census Tract)</li> <li>Metropolitan Transportation Commission (MTC) Equity priority communities</li> </ul>	Calculate each indicator (i.e., health and equity) and buffer every network segment by 500 feet, taking the proportional average of each indicator and percentile. Indicators: <ul style="list-style-type: none"> <li>Composite health (density of)               <ul style="list-style-type: none"> <li>High Blood Pressure</li> <li>Coronary Heart Disease</li> <li>Diabetes</li> </ul> </li> <li>Composite Equity (density of)               <ul style="list-style-type: none"> <li>Low-income workers per acre</li> <li>Severely rent-burdened population</li> <li>Zero-vehicle household</li> </ul> </li> </ul>	25
<b>Connectivity</b>	The project improves connections to destinations, including schools, recreation, transit, regional trails, and commercial centers. Project may also overcome major barriers (i.e., major arterials and rail lines).	City location data for: <ul style="list-style-type: none"> <li>Schools</li> <li>Parks</li> <li>Transit hubs</li> <li>Regional Trails</li> <li>Commercial Areas</li> <li>Roadways</li> <li>Railways</li> </ul>	Proximity Analysis (within 1,000 ft) 5 points per destination type, within 1,000 ft	35
<b>Community Support</b>	The project addresses the most commonly identified needs or barriers received by community input.	Comments from public input map and BPAC	Public support density percentile tool	15
<b>Total</b>				<b>100</b>



*Bicycle parking at the Richmond Ferry Terminal.*

## Bicycle Project Prioritization Results

Prioritization scores for the recommended bicycle improvement projects ranged between 24 and 81 points (out of 100 possible points). The average project score was 53. Bicycle Project Prioritization results are shown in **Table 09** below.

**Table 10** lists each project with its prioritization score and category. **Figures 13 through 15** on the following pages show the category of each recommended bicycle project. **Figures 16 through 18** highlight the high-priority projects.

**Table 09** Bicycle Prioritization Summary

PRIORITIZATION CATEGORY	POINT RANGE	NUMBER OF PROJECTS
High-Priority	65-100	41
Medium-Priority	48-64	63
Opportunity	0-47	72

# BICYCLE PROJECT PRIORITIZATION

## TRAVEL SAFE RICHMOND

### PROPOSED BICYCLE FACILITIES

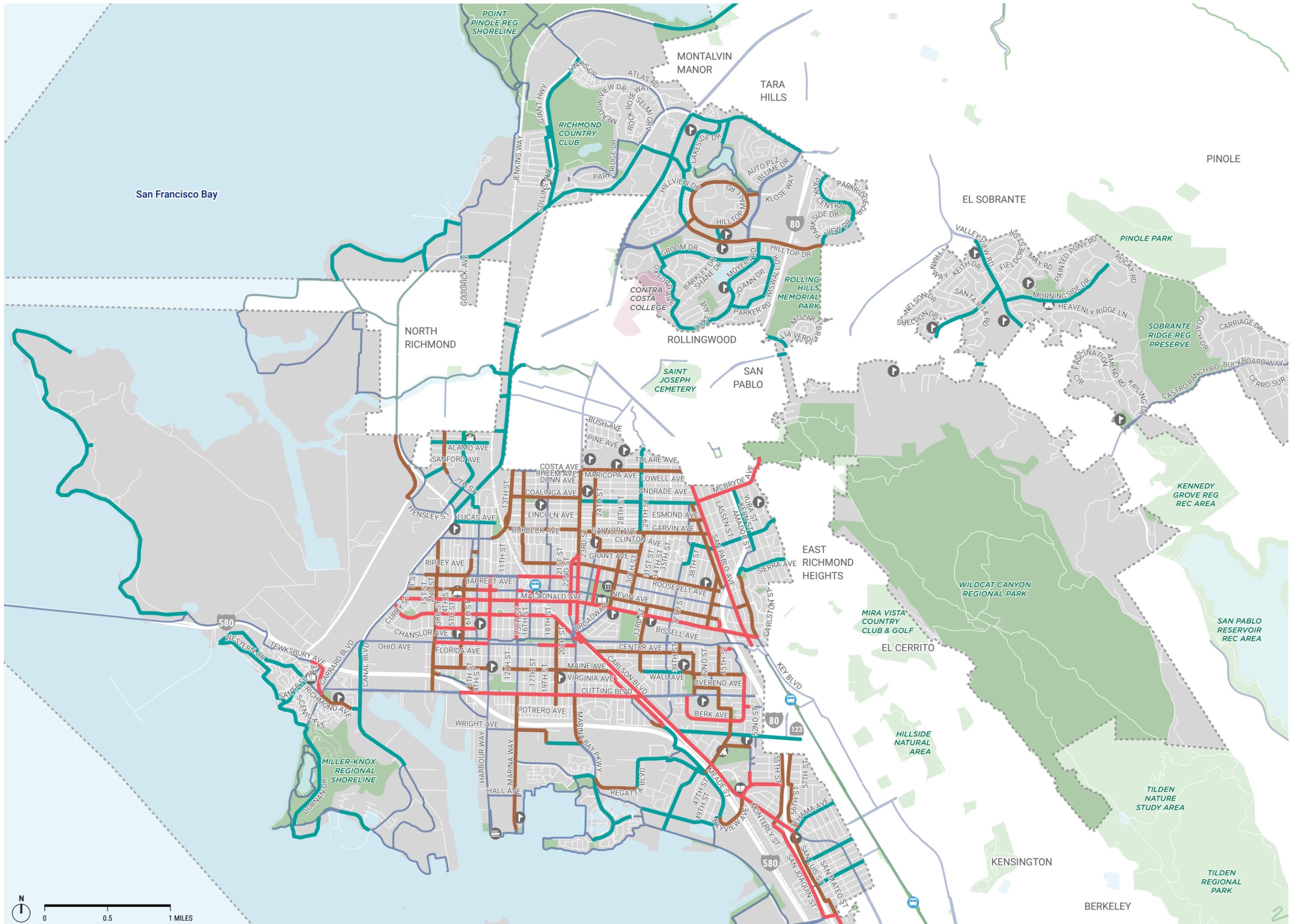
- Prioritization Category
- High-Priority Project
  - Medium-Priority Project
  - Opportunity Project

### EXISTING BICYCLE FACILITIES

- Existing Bicycle Facilities

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 13 Proposed Bicycle Improvements by Prioritization Category

# BICYCLE PROJECT PRIORITIZATION

## CENTRAL CORE

TRAVEL SAFE RICHMOND

### PROPOSED BICYCLE FACILITIES

Prioritization Category

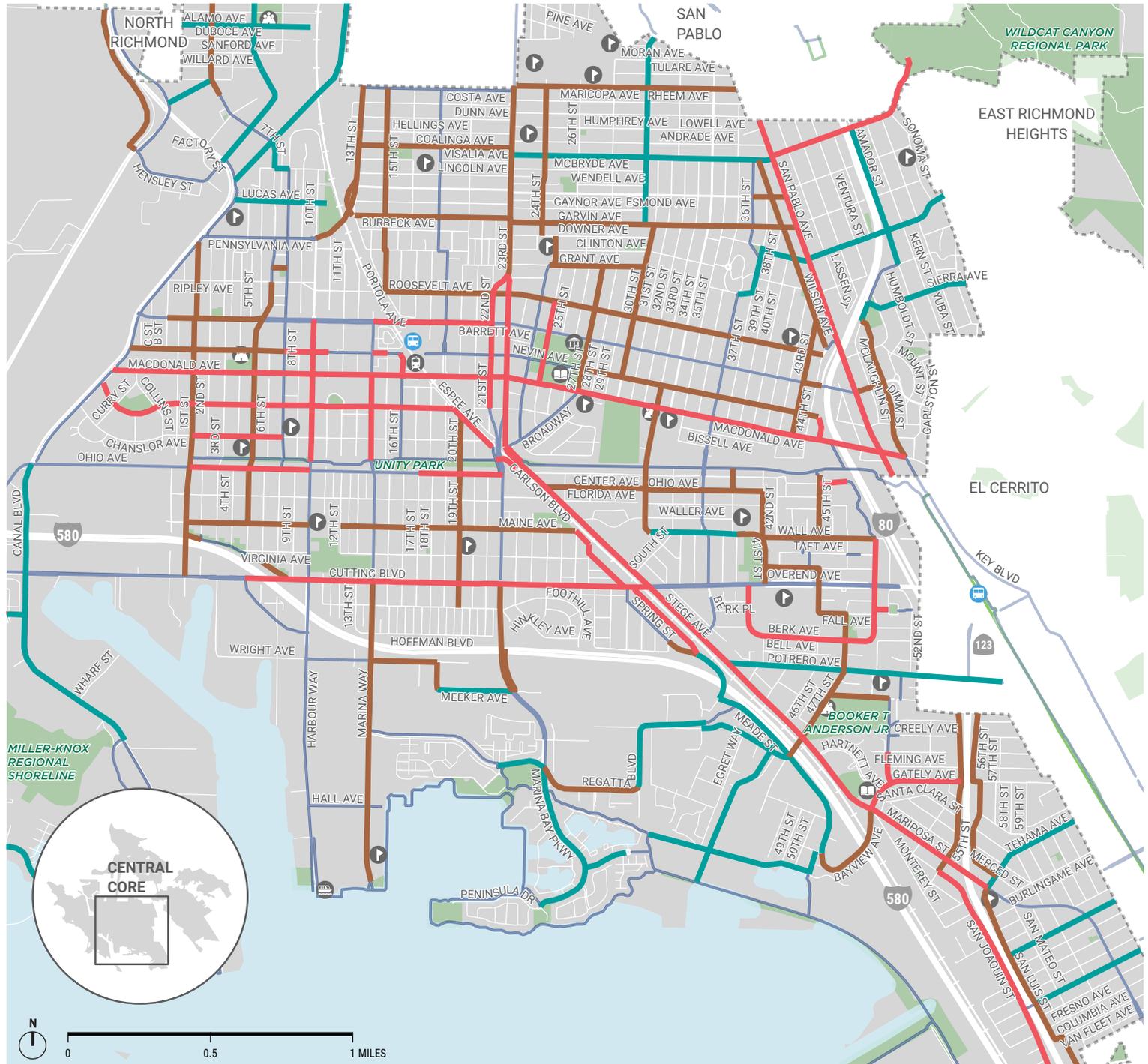
- High-Priority Project
- Medium-Priority Project
- Opportunity Project

### EXISTING BICYCLE FACILITIES

- Existing Bicycle Facilities

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.



Figure 14 Proposed Bicycle Improvements by Prioritization Category (Central Core)

# BICYCLE PROJECT PRIORITIZATION

NORTH RICHMOND

TRAVEL SAFE RICHMOND

## BICYCLE PROJECT PRIORITIZATION

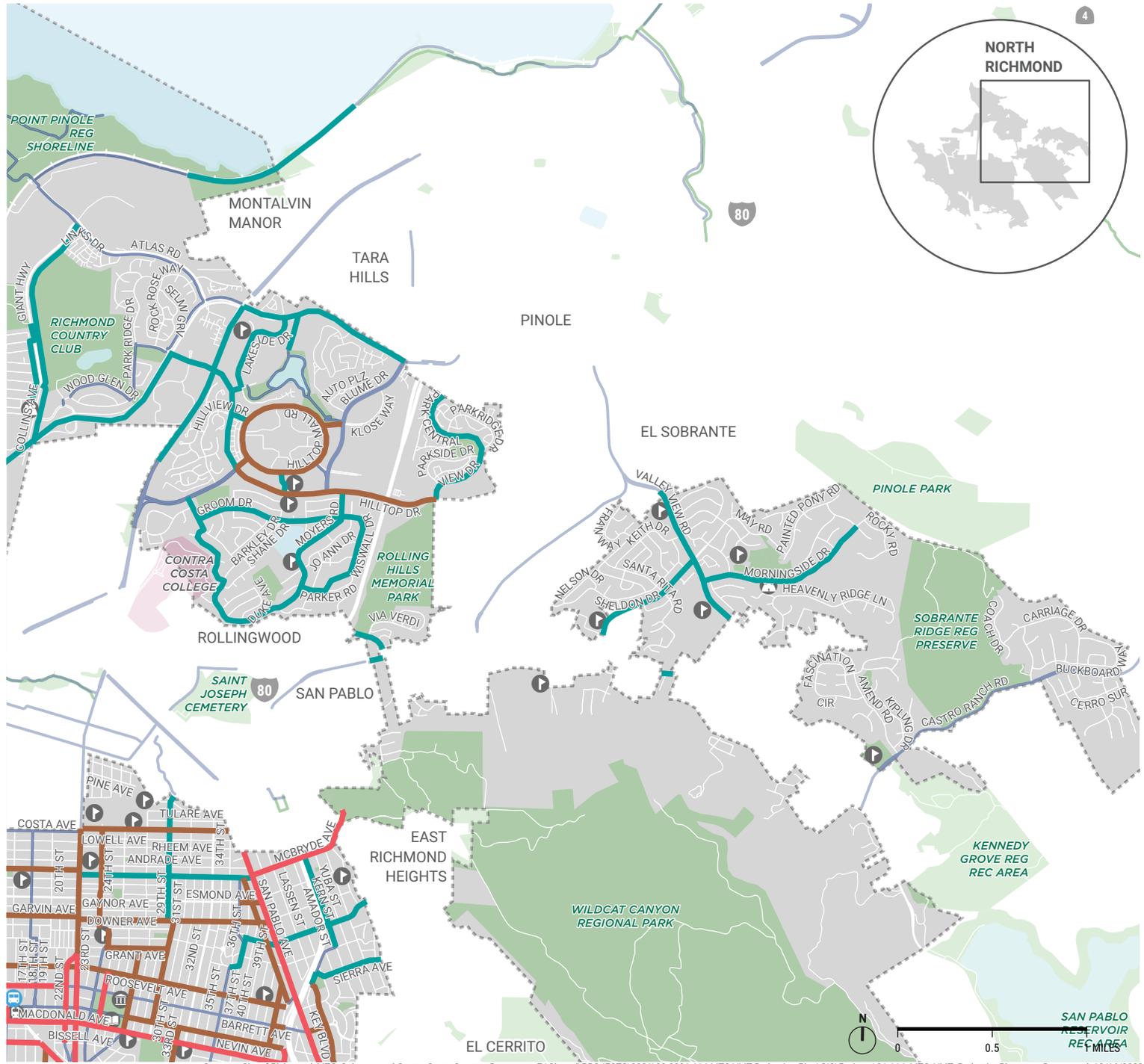
- High-Priority Project
- Medium-Priority Project
- Opportunity Project

## EXISTING BICYCLE FACILITIES

- Existing Bicycle Facilities

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 15 Proposed Bicycle Improvements by Prioritization Category (North Richmond)

# HIGH PRIORITY BICYCLE PROJECTS

## TRAVEL SAFE RICHMOND

### PROPOSED BICYCLE FACILITIES

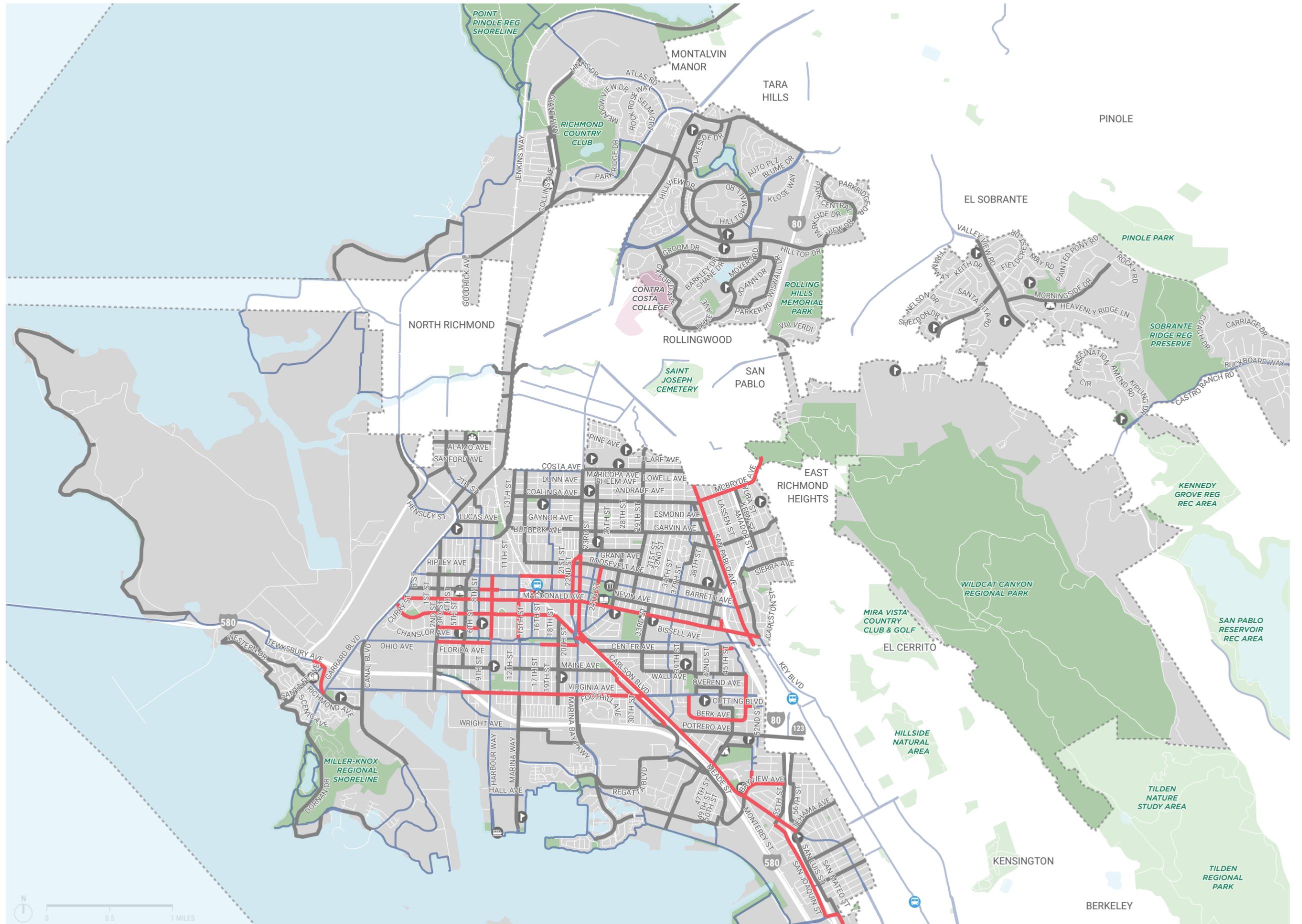
- High-Priority Project
- Medium-Priority and Opportunity Project

### EXISTING BICYCLE FACILITIES

- Existing Bicycle Facilities

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.



Figure 16 High Priority Bicycle Improvement Projects

# HIGH PRIORITY BICYCLE PROJECTS

## CENTRAL CORE

TRAVEL SAFE RICHMOND

### PROPOSED BICYCLE FACILITIES

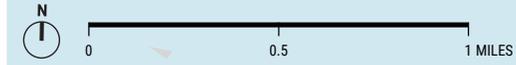
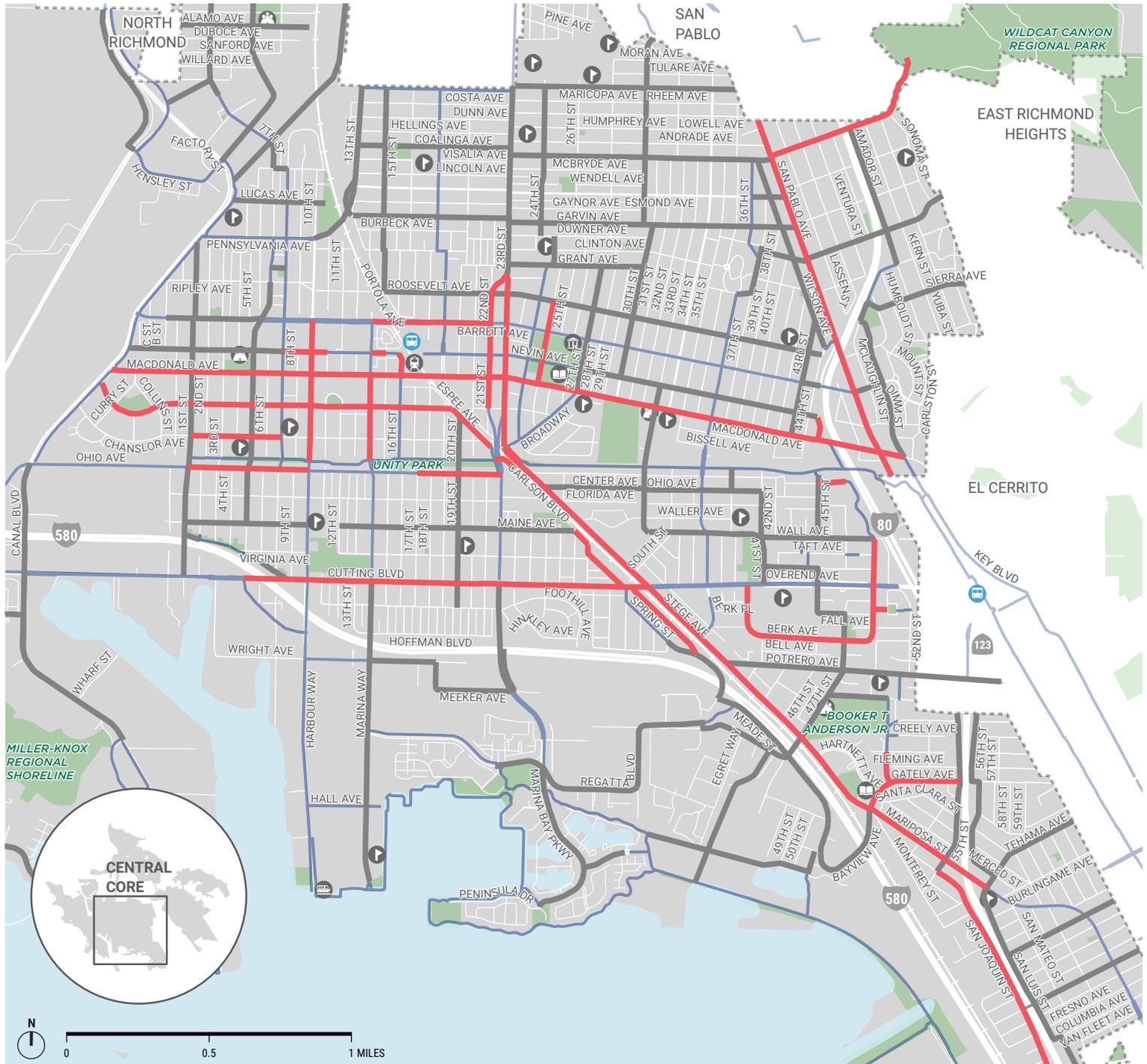
- High-Priority Project
- Medium-Priority and Opportunity Project

### EXISTING BICYCLE FACILITIES

- Existing Bicycle Facilities

### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.



Figure 17 High Priority Bicycle Improvement Projects (Central Core)



**Table 10** Bicycle Projects by Prioritization Scores

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Carlson Blvd	Richmond Greenway	Broadway	Class I Shared-Use Path	0.07	81	High-Priority
23rd St Overcrossing	Richmond Greenway	Richmond Greenway	Class I Shared-Use Path	0.11	80	High-Priority
Central Ave	Jacuzzi St	Pierce St	Class I Shared-Use Path	0.10	79	High-Priority
Harbour Way	Richmond Greenway	Macdonald Ave	Class II Bicycle Lane	0.31	77	High-Priority
16th St	Macdonald Ave	Livingston Ln	Class IV Separated Bikeway	0.01	77	High-Priority
Macdonald Ave	Harbour Way	16th St	Class III Bicycle Route	0.32	77	High-Priority
16th St	Nevin Plaza	Richmond Greenway	Class IIIB Bicycle Boulevard	0.08	77	High-Priority
Nevin Ave	Marina Way	15th St	Class IIIB Bicycle Boulevard	0.05	76	High-Priority
Pierce St	Central Ave	Cerrito Creek	Class IV Separated Bikeway	0.23	75	High-Priority
Marina Way	Macdonald Ave	Richmond Greenway	Class II Bicycle Lane	0.30	75	High-Priority
S 49th St	Wall Ave	Cutting Blvd	Class IIIB Bicycle Boulevard	0.17	75	High-Priority
23rd St	Broadway	Brooks Ave	Class II Bicycle Lane	0.61	75	High-Priority
Espee Ave	Bissell Ave	Trail south of Chanslor Ave	Class IIIB Bicycle Boulevard	0.19	75	High-Priority
Carlson Blvd	Bayview Ave	Broadway	Class IV Separated Bikeway	1.81	73	High-Priority
Carlson Blvd	Bayview Ave	Tehama Ave	Class IIB Buffered Bicycle Lane	0.49	72	High-Priority
Bayview Ave	Seaport Ave	S 55th St	Class IIB Buffered Bicycle Lane	0.36	72	High-Priority
Barrett Ave	19th St	Marina Way	Class IV Separated Bikeway	0.21	72	High-Priority
Plaza Way	S 49th St	S 50th St	Class IIIB Bicycle Boulevard	0.05	72	High-Priority
Ohio Ave	Harbour Way	2nd St	Class IIIB Bicycle Boulevard	0.42	72	High-Priority
Barrett Ave	19th St	22nd St	Class II Bicycle Lane	0.20	71	High-Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Harbour Way	Macdonald Ave	Barrett Ave	Class II Bicycle Lane	0.19	71	High-Priority
New Shared-Use Path	S 28th St	S 29th St	Class I Shared-Use Path	0.07	70	High-Priority
Nevin Ave	8th St	11th St	Class IIIB Bicycle Boulevard	0.16	70	High-Priority
San Joaquin St	Central Ave	Imperial Ave	Class III Bicycle Route	0.83	69	High-Priority
Berk Ave - S 49th St	Cutting Blvd	Cutting Blvd	Class IIIB Bicycle Boulevard	0.78	68	High-Priority
Spring St	S 29th St	Regatta Blvd	Class IIIB Bicycle Boulevard	0.52	68	High-Priority
Tewksbury Ave	Santa Fe Ave	Washington Ave	Class IV Separated Bikeway	0.10	68	High-Priority
22nd St	Brooks Ave	Bissell Ave	Class II Bicycle Lane	0.49	68	High-Priority
Chanslor Ave	2nd St	8th St	Class IIIB Bicycle Boulevard	0.32	67	High-Priority
Macdonald Ave	Richmond Parkway	Harbour Way	Class II Bicycle Lane	0.70	67	High-Priority
Cutting Blvd	Hoffman Blvd	Carlson Blvd	Class IV Separated Bikeway	1.43	67	High-Priority
BNSF Easement near Railroad Ave (not acquired yet)	Richmond Ave	Washington Ave/ Tewksbury Ave	Class I Shared-Use Path	0.23	66	High-Priority
Bissell Ave	Richmond Parkway	Espee Ave	Class IIIB Bicycle Boulevard	1.29	66	High-Priority
Ells St	Fleming Ave	Bayview Ave	Class IIIB Bicycle Boulevard	0.11	65	High-Priority
San Pablo Ave	Natalie Ct (City Boundary)	Macdonald Ave (City Boundary)	Class IV Separated Bikeway	1.34	65	High-Priority
Macdonald Ave	16th St	Key Blvd	Class II Bicycle Lane	1.80	65	High-Priority
McBryde Ave	San Pablo Ave	Wildcat Canyon Parking Lot	Class II Bicycle Lane	0.65	65	High-Priority
Miraflores Greenbelt - Ohio Connection	S 45th St	Miraflores Greenbelt	Class I Shared-Use Path	0.10	65	High-Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
45th St	Nevin Ave	Macdonald Ave	Class IIIB Bicycle Boulevard	0.08	65	High-Priority
Ohio Ave	17th St	23rd St	Class II Bicycle Lane	0.30	65	High-Priority
25th St	Macdonald Ave	Roosevelt Ave	Class IIIB Bicycle Boulevard	0.30	65	High-Priority
2nd/ S 2nd St	I-580	Pennsylvania Ave	Class IIIB Bicycle Boulevard	1.05	64	Medium-Priority
Nevin Ave	Richmond Parkway	8th St	Class IIIB Bicycle Boulevard	0.54	64	Medium-Priority
6th St	Maine Ave	Ripley Ave	Class III Bicycle Route	0.73	64	Medium-Priority
Southside Park Trail extension	S 7th St	Cutting Blvd	Class I Shared-Use Path	0.11	64	Medium-Priority
23rd St	Brooks Ave	Maricopa Ave	Class II Bicycle Lane	0.66	63	Medium-Priority
New Shared-Use Path	Lincoln Ave	Garvin Ave	Class I Shared-Use Path	0.14	63	Medium-Priority
Wilson Ave	McBryde Ave	44th St	Class IIIB Bicycle Boulevard	0.70	63	Medium-Priority
S 41st St	Center Ave	Cutting Blvd	Class IIIB Bicycle Boulevard	0.33	63	Medium-Priority
Bayview Ave	Seaport Ave	S 55th St	Class IV Separated Bikeway	0.36	63	Medium-Priority
43rd St	Macdonald Ave	Wilson Ave	Class IIIB Bicycle Boulevard	0.42	63	Medium-Priority
13th St	Harbour Way	Costa Ave / City Boundary	Class IV Separated Bikeway	0.60	62	Medium-Priority
Maine Ave	S 2nd St	Harbour Way	Class IIIB Bicycle Boulevard	0.43	62	Medium-Priority
Barrett Ave	A St	7th St	Class IIIB Bicycle Boulevard	0.34	62	Medium-Priority
S 47th St - Fall Ave - S 45th St - Overend Ave - JFK Park	Wall Ave	Potrero Ave	Class IIIB Bicycle Boulevard	0.64	61	Medium-Priority
Nevin Ave	27th St	45th St	Class IIIB Bicycle Boulevard	0.85	61	Medium-Priority

Table 10 Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
7th St	Barrett Ave	Ripley Ave	Class II Bicycle Lane	0.13	61	Medium-Priority
San Luis St	Central Ave	Carlson Blvd	Class III Bicycle Route	0.75	60	Medium-Priority
S 55th St	San Joaquin St	Creely Ave / City Boundary	Class III Bicycle Route	0.58	60	Medium-Priority
Maine Ave	S 12th St	S 28th St	Class IIIB Bicycle Boulevard	0.82	60	Medium-Priority
Barrett Ave	San Pablo Ave	Key Blvd	Class II Bicycle Lane	0.11	60	Medium-Priority
S 47th St - I-580 Overpass	Carlson Blvd	Meade St	Class I Shared-Use Path	0.08	60	Medium-Priority
Central Ave	Existing Bay Trail	Rydin Rd	Class I Shared-Use Path	0.02	59	Medium-Priority
S 47th St	Potrero Ave	Carlson Blvd	Class II Bicycle Lane	0.28	59	Medium-Priority
Southside Park Trail west extension	S 3rd St	S 2nd St	Class I Shared-Use Path	0.06	59	Medium-Priority
Grant Ave	23rd St	24th St	Class III Bicycle Route	0.14	58	Medium-Priority
Center Ave	Carlson Blvd	S 41st St	Class IIIB Bicycle Boulevard	0.76	57	Medium-Priority
S 2nd St	I-580	Cutting Blvd	Class II Bicycle Lane	0.13	57	Medium-Priority
Barrett Ave	43rd St	45th St	Class II Bicycle Lane	0.07	57	Medium-Priority
20th St	Espee Ave	Potrero Ave	Class IIIB Bicycle Boulevard	0.67	57	Medium-Priority
Klose Way	Hilltop Mall Rd	Blume Dr	Class II Bicycle Lane	0.10	57	Medium-Priority
S 33rd St	Wall Ave	Nevin Ave	Class IIIB Bicycle Boulevard	0.53	56	Medium-Priority
Esmond Ave	San Pablo Ave	37th St	Class IIIB Bicycle Boulevard	0.12	56	Medium-Priority
Cypress Ave	S 47th St	Ells St	Class IIIB Bicycle Boulevard	0.21	55	Medium-Priority
15th St	Roosevelt Ave	Costa Ave	Class IIIB Bicycle Boulevard	0.72	55	Medium-Priority
Coalinga Ave	13th St	23rd St	Class IIIB Bicycle Boulevard	0.54	55	Medium-Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Robert Miller Dr	Hilltop Mall Rd	Hilltop Dr	Class II Bicycle Lane	0.08	55	Medium-Priority
S 45th St	Richmond Greenway	Wall Ave	Class IIIB Bicycle Boulevard	0.22	54	Medium-Priority
24th St	Maricopa Ave	Downer Ave	Class IIIB Bicycle Boulevard	0.53	54	Medium-Priority
Grant Ave	24th St	30th St	Class II Bicycle Lane	0.32	54	Medium-Priority
Marina Bay Pkwy	Cutting Blvd	Meeker Ave	Class IV Separated Bikeway	0.39	53	Medium-Priority
Elm St	7th St	8th St	Class IIIB Bicycle Boulevard	0.05	53	Medium-Priority
Wright Ave	Marina Way	S 19th St	Class II Bicycle Lane	0.24	53	Medium-Priority
E Richmond Ave	Gerrard Blvd	Canal Blvd Parking Lot Cut Through	Class II Bicycle Lane	0.27	53	Medium-Priority
Roosevelt Ave	Portola Ave	44th St	Class IIIB Bicycle Boulevard	1.56	53	Medium-Priority
30th St	Garvin Ave	Nevin Ave	Class IIIB Bicycle Boulevard	0.55	53	Medium-Priority
25th St	Grant Ave	Downer Ave	Class II Bicycle Lane	0.12	53	Medium-Priority
S 19th St	Wright Ave	Meeker Ave	Class III Bicycle Route	0.10	53	Medium-Priority
27th St	Broadway	Grant Ave	Class IIIB Bicycle Boulevard	0.45	53	Medium-Priority
Marina Way	Cutting Blvd	Waterfront / Lucretia Edwards Park	Class IV Separated Bikeway	1.06	52	Medium-Priority
Wall Ave	S 41st St	S 49th St	Class IIIB Bicycle Boulevard	0.40	52	Medium-Priority
Maricopa Ave	23rd St	36th St	Class IIIB Bicycle Boulevard	0.77	50	Medium-Priority
Regatta Blvd	Marina Bay Pkwy	S 32nd St	Class II Bicycle Lane	0.37	50	Medium-Priority
Key Blvd	Macdonald Ave	Clinton Ave	Class II Bicycle Lane	0.51	50	Medium-Priority
Bay Trail - Chevron Realignment (ROW not acquired)	Hensley Ave	North Richmond Border	Class I Shared-Use Path	0.57	50	Medium-Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Garvin Ave	Portola Ave	San Pablo Ave	Class IIIB Bicycle Boulevard	1.57	49	Medium-Priority
Marina Bay Pkwy	I-580	Meeker Ave	Class I Shared-Use Path	0.16	49	Medium-Priority
Hilltop Mall Rd	Hilltop Mall Rd	Hilltop Mall Rd	Class IV Separated Bikeway	1.28	49	Medium-Priority
Regatta Blvd	Spring St	Julia Woods St	Class III Bicycle Route	0.11	49	Medium-Priority
S 39th St	Center Ave	Richmond Greenway	Class IIIB Bicycle Boulevard	0.08	49	Medium-Priority
S 56th St	Tehama Ave	Carlos Ave / City Boundary	Class III Bicycle Route	0.64	48	Medium-Priority
Hilltop Dr	Robert Miller Dr	Park Central St	Class IV Separated Bikeway	1.11	48	Medium-Priority
Filbert St	Chesley Ave	Existing Class II	Class IIIB Bicycle Boulevard	0.34	48	Medium-Priority
Wall Ave	S 39th St	S 41st St	Class I Shared-Use Path	0.09	47	Medium-Priority
Wall Ave	S 33rd St	John F. Kennedy Park	Class IIIB Bicycle Boulevard	0.34	47	Opportunity Priority
Alamo Ave	Cherry St	City Boundary (North Richmond)	Class IIIB Bicycle Boulevard	0.45	47	Opportunity Priority
Shane Dr	Hilltop Mall Rd	Hilltop Dr	Class IV Separated Bikeway	0.12	47	Opportunity Priority
7th St	7th St bike lane	Lincoln Ave	Class III Bicycle Route	0.10	46	Opportunity Priority
Amador Street	McBryde Ave	Clinton Ave	Class III Bicycle Route	0.51	46	Opportunity Priority
Tehama Ave	Carlson Blvd	City Boundary (El Cerrito)	Class IIIB Bicycle Boulevard	0.40	45	Opportunity Priority
Meade St	Regatta Blvd	Seaport Ave	Class IV Separated Bikeway	0.72	45	Opportunity Priority
Clinton Ave	Key Blvd	Sierra Ave	Class IIIB Bicycle Boulevard	0.07	45	Opportunity Priority
Kelsey St	Chesley Ave	Willard Ave	Class IIIB Bicycle Boulevard	0.25	45	Opportunity Priority
Regatta Blvd	Regatta Blvd Trail	Julia Wood St/Spring St	Class IV Separated Bikeway	0.20	45	Opportunity Priority

Table 10 Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Richmond Pkwy	San Pablo Ave	Blume Dr	Class IV Separated Bikeway	0.94	45	Opportunity Priority
Hilltop Lake - Richmond Parkway Connector	Hilltop Lake Trail	Richmond Parkway	Class I Shared-Use Path	0.19	45	Opportunity Priority
Sierra Ave	Clinton Ave	City Limits	Class IIIB Bicycle Boulevard	0.36	45	Opportunity Priority
Sacramento Ave	San Pablo Ave	San Luis St	Class IIIB Bicycle Boulevard	0.41	44	Opportunity Priority
Potrero Ave	Carlson Blvd	San Pablo Ave (beyond City limit)	Class II Bicycle Lane	0.97	44	Opportunity Priority
Marina Bay Parkway	Regatta Blvd	Peninsula Dr	Class II Bicycle Lane	0.63	44	Opportunity Priority
Solano Ave	38th Ave	City Boundary	Class IIIB Bicycle Boulevard	0.71	44	Opportunity Priority
Lucas Ave	Richmond Parkway	Lucas Park	Class IIIB Bicycle Boulevard	0.32	44	Opportunity Priority
Hilltop Dr	Richmond Parkway	Robert Miller Dr	Class IV Separated Bikeway	0.84	44	Opportunity Priority
McBryde Ave	23rd St	San Pablo Ave	Class IIIB Bicycle Boulevard	0.91	44	Opportunity Priority
29th St	Howard St	Garvin Ave	Class IIIB Bicycle Boulevard	0.66	44	Opportunity Priority
Regatta Blvd	Bay Trail / Marina Park & Green	Marina Bay Parkway	Class IV Separated Bikeway	0.17	44	Opportunity Priority
Chesley Ave	UPRR	BNSF	Class IIIB Bicycle Boulevard	0.10	44	Opportunity Priority
Robin Dr	Regatta Blvd	Meade St	Class I Shared-Use Path	0.34	43	Opportunity Priority
McGlothen Way - Phanor Dr - Giant Hwy	Williams Dr	Point Pinole Regional Shoreline Park	Class IIIB Bicycle Boulevard	0.44	43	Opportunity Priority
Groom Dr - Wiswall Dr - Parker Rd	Oxford Ave	Movers Rd	Class IIIB Bicycle Boulevard	1.48	43	Opportunity Priority
Lincoln Ave	8th St	7th St	Class IIIB Bicycle Boulevard	0.05	43	Opportunity Priority
S 51st St	Seaport Ave	Bay Trail	Class IIIB Bicycle Boulevard	0.08	42	Opportunity Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Meeker Ave	S 19th St	Marina Bay Parkway	Class II Bicycle Lane	0.26	41	Opportunity Priority
Canal Blvd	Ohio Ave	Cutting Blvd	Class IV Separated Bikeway	0.38	41	Opportunity Priority
San Pablo Ave	Hilltop Dr	Richmond Pkwy	Class IV Separated Bikeway	0.37	41	Opportunity Priority
Sutter Ave	San Luis St	San Pablo city limit	Class IIIB Bicycle Boulevard	0.42	41	Opportunity Priority
New Shared-Use Path	Proposed San Pablo Creek Trail	Richmond Parkway	Class I Shared-Use Path	1.59	40	Opportunity Priority
N Castro St	Bay Trail	Filbert St	Class IIIB Bicycle Boulevard	0.17	40	Opportunity Priority
Washington Ave	Casey Dr	Richmond Ave	Class III Bicycle Route	0.25	40	Opportunity Priority
Lakeside Dr	Richmond Parkway	Research Dr	Class II Bicycle Lane	0.54	40	Opportunity Priority
San Pablo Creek Trail	North Richmond Border	San Pablo Border	Class I Shared-Use Path	0.11	40	Opportunity Priority
Research Dr	Hilltop Dr	Lakeside Dr	Class IIIB Bicycle Boulevard	0.05	39	Opportunity Priority
Park Central St	Hilltop Dr	Park Central Ct	Class IV Separated Bikeway	0.86	39	Opportunity Priority
Golden Gate Ave	Ocean Ave	Washington Ave	Class III Bicycle Route	0.86	39	Opportunity Priority
Richmond Ave - Canal Blvd connector	Richmond Ave	Canal Blvd	Class I Shared-Use Path	0.06	38	Opportunity Priority
Moyers Rd - Oxford Ave - Birmingham Dr	Hilltop Dr	Hilltop Dr	Class IIIB Bicycle Boulevard	1.89	38	Opportunity Priority
Valley View Rd	City Boundary (El Sobrante)	Pine Hill Dr	Class IV Separated Bikeway	0.78	38	Opportunity Priority
Hensley St	Willard Ave	Richmond Parkway	Class II Bicycle Lane	0.40	38	Opportunity Priority
Doran Dr	Western Dr	Brickyard Cove Rd	Class IV Separated Bikeway	0.87	38	Opportunity Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
El Portal Dr	Near I-80	Near San Pablo Dam Rd	Class II Bicycle Lane	0.18	38	Opportunity Priority
Hillview Dr	Hilltop Mall Rd	Hilltop Dr	Class IV Separated Bikeway	0.09	38	Opportunity Priority
Richmond Pkwy	Goodrick Ave	Hilltop Dr	Class IV Separated Bikeway	1.76	37	Opportunity Priority
San Pablo Dam Rd	El Portal Dr	City Limits	Class IV Separated Bikeway	0.07	37	Opportunity Priority
Cerrito Ave - 38th St	37th St	Solano Ave	Class IIIB Bicycle Boulevard	0.22	36	Opportunity Priority
Canal Blvd	Cutting Blvd	Seacliff Dr	Class IV Separated Bikeway	0.76	36	Opportunity Priority
Point Richmond Bike Boulevard	Ocean Ave	Garrard Blvd	Class III Bicycle Route	1.17	35	Opportunity Priority
Bay Trail Extension: Miller-Knox Regional Shoreline	Existing Bay Trail near Dornan Dr	Existing Bay Trail near Brickyard Cove Rd	Class I Shared-Use Path	0.40	35	Opportunity Priority
Park Central St Shopping Center Access	Park Central Ct	Shopping Center	Class I Shared-Use Path	0.03	34	Opportunity Priority
Wildcat Creek Trail Gap Closure	Existing trail (North Richmond)	Existing trail (near Hubert Park - San Pablo)	Class I Shared-Use Path	0.34	34	Opportunity Priority
San Pablo Ave	Hilltop Dr	La Puerta Dr	Class II Bicycle Lane	0.57	34	Opportunity Priority
Brickyard Cove Rd	Dornan Dr	Sandpiper Spit	Class II Bicycle Lane	0.30	34	Opportunity Priority
Molate Point Bay Trail Extension	Stenmark Dr	Bridge Trail	Class I Shared-Use Path	2.39	33	Opportunity Priority
Morningside Dr	Valley View Rd	Full Moon Dr/ Thunderhead Ct	Class IIIB Bicycle Boulevard	0.93	33	Opportunity Priority
May Rd	Laurel Ln	Valley View Rd	Class II Bicycle Lane	0.66	33	Opportunity Priority

**Table 10** Bicycle Projects by Prioritization Scores (Continued)

STREET	START	END	RECOMMENDED FACILITY	MILES	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
Giant Hwy	Collins Ave	Richmond Parkway	Class IV Separated Bikeway	0.33	33	Opportunity Priority
Market Ave	San Pablo city limit	North Richmond city limit	Class IIIB Bicycle Boulevard	0.07	32	Opportunity Priority
New Shared-Use Path	Bay Trail	Meade St	Class I Shared-Use Path	0.58	31	Opportunity Priority
Bayside Dr	Marina Bay Pkwy	Traffic circle	Class II Bicycle Lane	0.15	31	Opportunity Priority
Giant Hwy	Atlas Rd	Griffin Dr	Class IV Separated Bikeway	0.95	31	Opportunity Priority
Bay Trail - near Meeker Slough	S 51st St Bay Trail Spur	Bay Trail near Bayside Ct	Class I Shared-Use Path	0.58	30	Opportunity Priority
Point Pinole Bay Trail spur	Existing Bay Trail/ North Richmond Border	Existing Bay Trail	Class I Shared-Use Path	0.60	26	Opportunity Priority
Bay Trail - North of Landfill Loop Trail	Landfill Loop Trail	Proposed Point Pinole Bay Trail Spur	Class I Shared-Use Path	0.99	26	Opportunity Priority
Point San Pablo Bay Trail extension	Molate Point Bay Trail extension	Point San Pablo	Class I Shared-Use Path	1.63	25	Opportunity Priority
Bay Trail Extension: Point Pinole - San Pablo Bay Regional Shoreline	Existing Bay Trail	Existing Bay Trail	Class I Shared-Use Path	1.02	25	Opportunity Priority
Regatta Blvd	S 32nd St	Robin Dr	Class II Bicycle Lane	0.44	25	Opportunity Priority
San Pablo Dam Rd	Near Martins Ln	Near Martins Ln	Class IV Separated Bikeway	0.06	24	Opportunity Priority



*Intersection at the Richmond Wellness Trail.*

## Pedestrian Project Prioritization Results

Prioritization scores for the recommended pedestrian improvement projects ranged between 27 and 81 points (out of 100 possible points). The average project score was 61. Pedestrian Project Prioritization results are shown in **Table 11**.

**Figures 19 through 21** on the following pages show the category of each recommended pedestrian project. **Figures 22 through 24** show the high priority projects, and **Table 12** lists all of the recommended pedestrian spot improvements with their prioritization scores.

**Table 11** Pedestrian Spot Recommendation Prioritization Summary

PRIORITIZATION CATEGORY	POINT RANGE	NUMBER OF PROJECTS
High-Priority	76-100	31
Medium-Priority	58-75	43
Opportunity Priority	0-57	37

# PROPOSED PEDESTRIAN SPOT IMPROVEMENT PRIORITIZATION

## TRAVEL SAFE RICHMOND

### PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

#### Prioritization Category

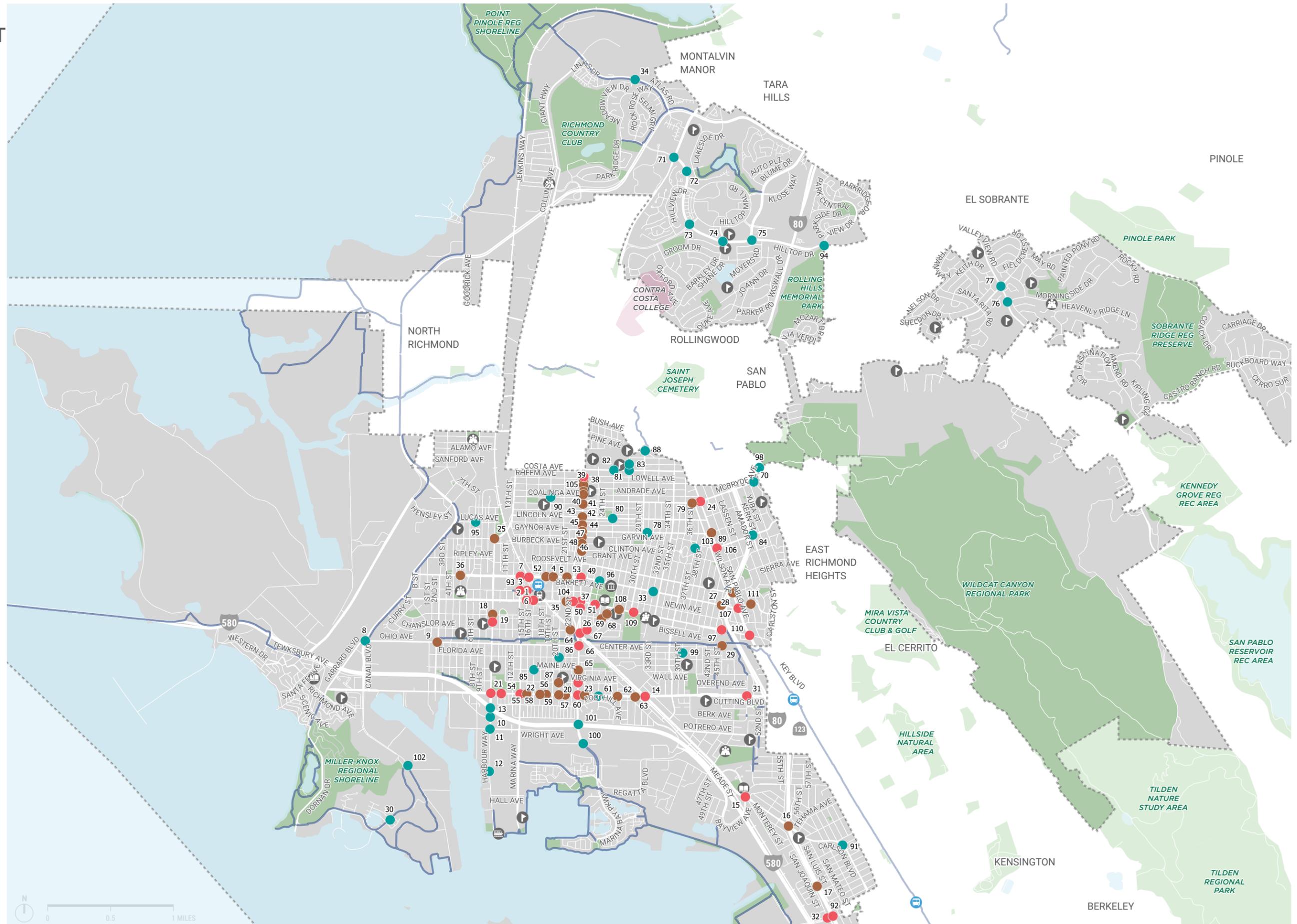
- High-Priority Project
- Medium-Priority Project
- Opportunity Project

#### EXISTING PEDESTRIAN FACILITIES

- Existing Class I Shared-Use Path

#### BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 19 Proposed Spot Improvements by Prioritization Category

# PROPOSED PEDESTRIAN SPOT IMPROVEMENT PRIORITIZATION CENTRAL CORE

TRAVEL SAFE RICHMOND

## PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

- High-Priority Project
- Medium-Priority Project
- Opportunity Project

## EXISTING PEDESTRIAN FACILITIES

- Existing Class I Shared-Use Path

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 20 Proposed Spot Improvements by Prioritization Category (Central Core)

# PROPOSED PEDESTRIAN SPOT IMPROVEMENT PRIORITIZATION

NORTH RICHMOND

TRAVEL SAFE RICHMOND

## PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

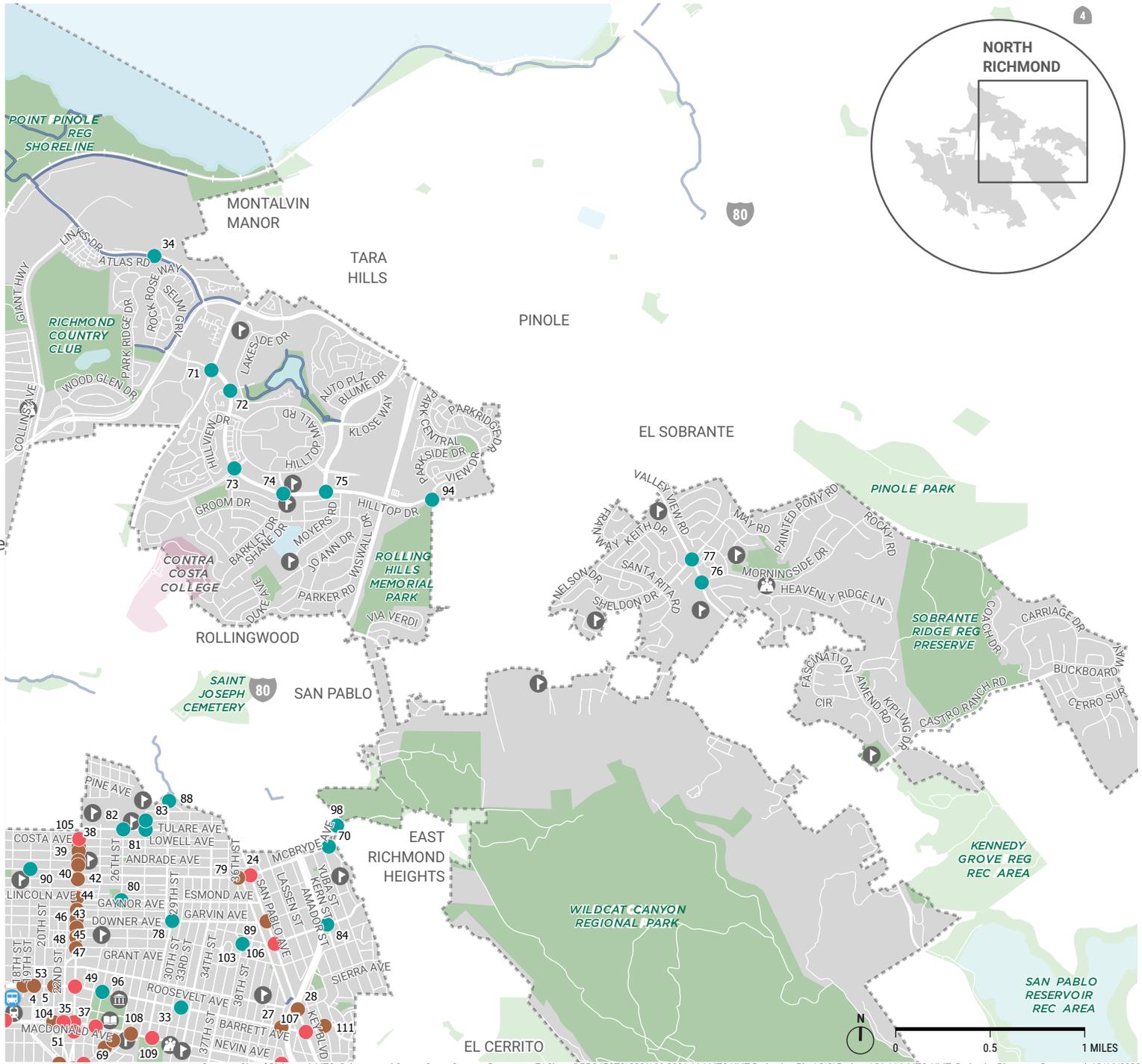
- High-Priority Project
- Medium-Priority Project
- Opportunity Project

## EXISTING PEDESTRIAN FACILITIES

- Existing Class I Shared-Use Path

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/16/2022.

Figure 21 Proposed Spot Improvements by Prioritization Category (North Richmond)

# HIGH PRIORITY PEDESTRIAN SPOT IMPROVEMENTS

## TRAVEL SAFE RICHMOND

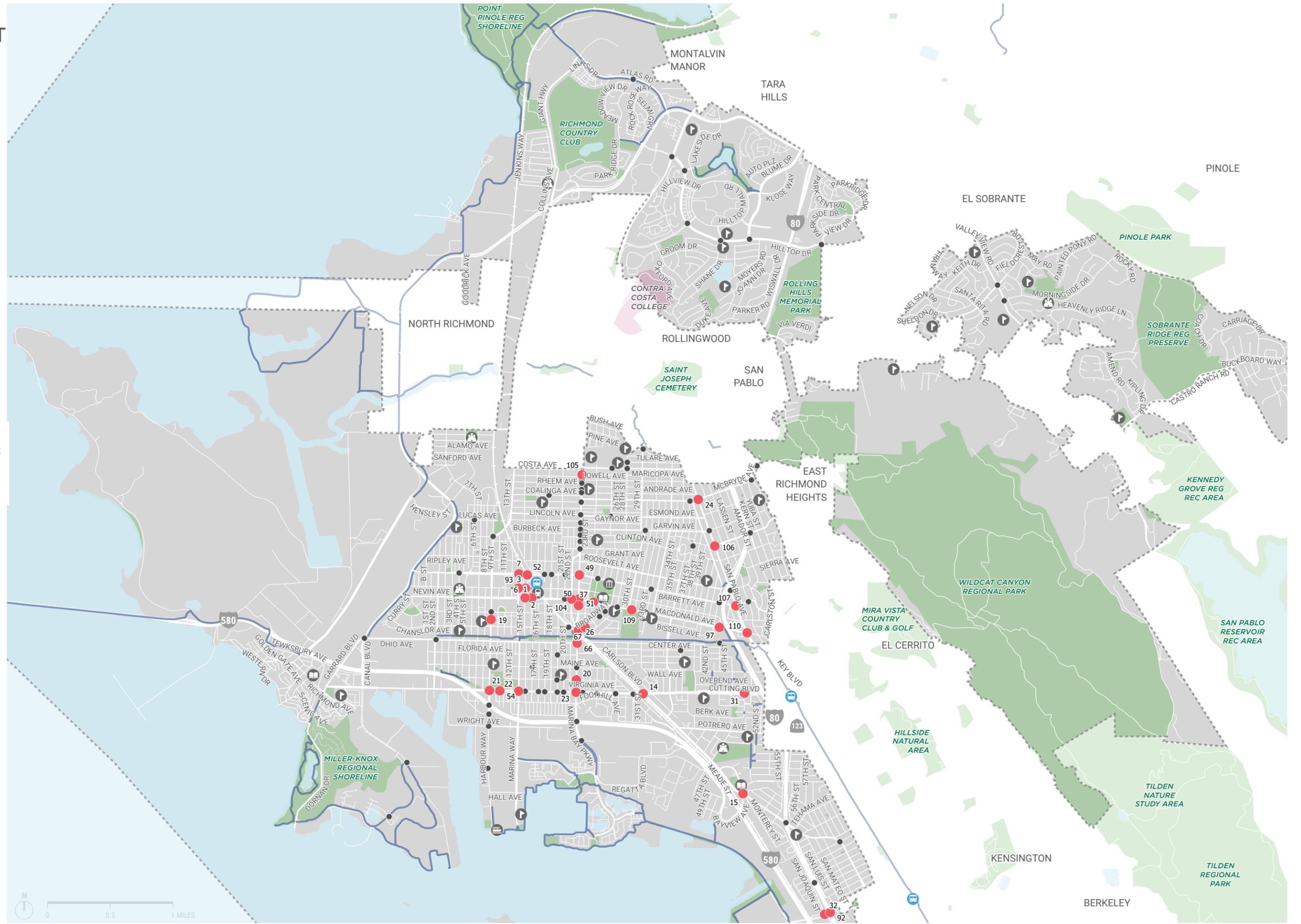
### PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

- Prioritization Category
- High-Priority Project
  - Medium-Priority and Opportunity Projects

### EXISTING PEDESTRIAN FACILITIES

- Class I Shared-Use Path

- ### BOUNDARIES + DESTINATIONS
- 🚇 BART Station
  - 🚆 Amtrak Station
  - 🚢 Ferry Terminal
  - 🎓 School
  - 🏛️ City Hall
  - 📖 Library
  - 🏠 Community Center
  - 🌳 Park
  - 🏫 Contra Costa College
  - 🗺️ City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/14/2022.

Figure 22 High Priority Spot Improvements

# HIGH PRIORITY PEDESTRIAN SPOT IMPROVEMENTS

CENTRAL CORE

TRAVEL SAFE RICHMOND

## PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

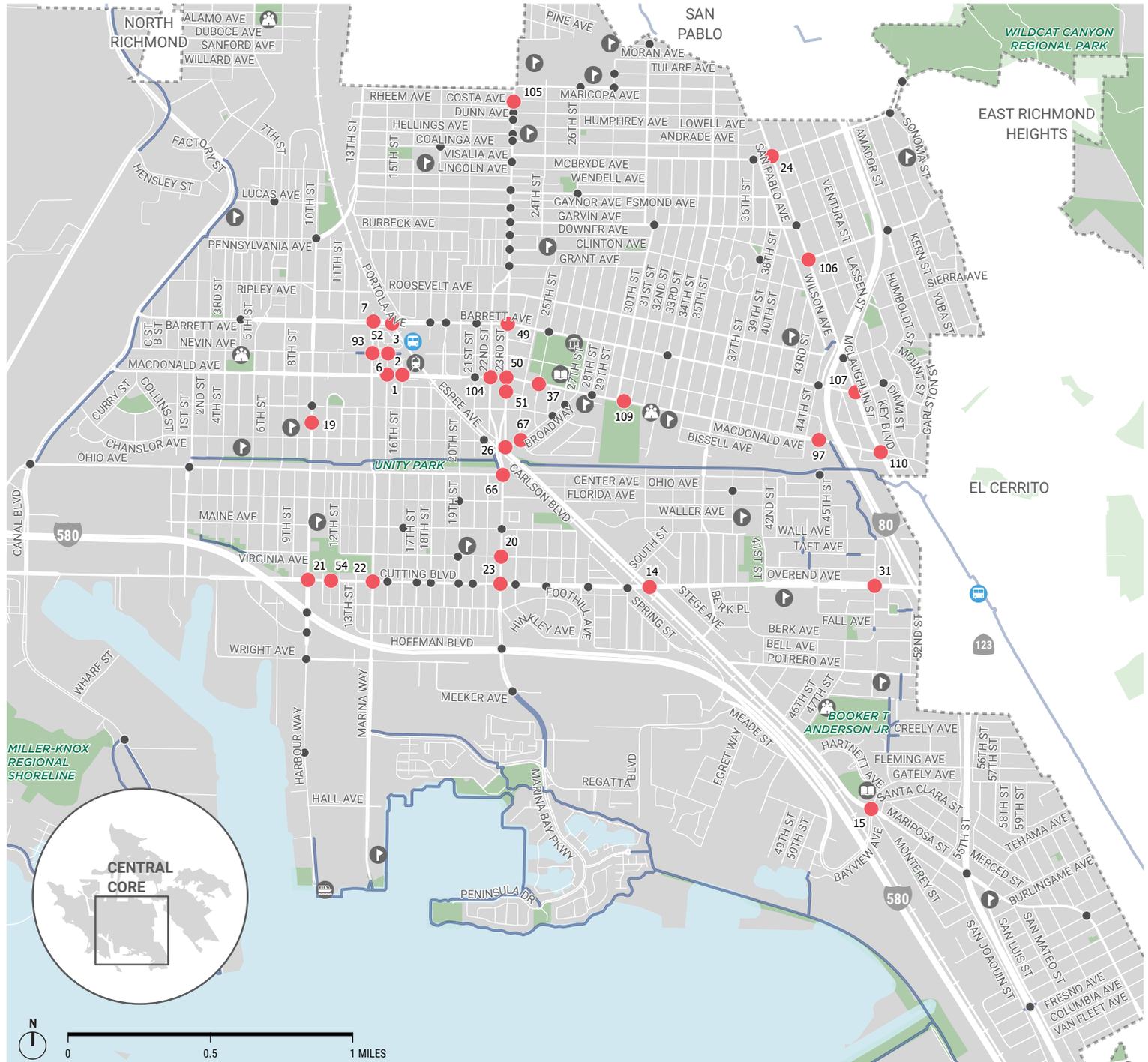
- High-Priority Project
- Medium-Priority and Opportunity Projects

## EXISTING PEDESTRIAN FACILITIES

— Class I Shared-Use Path

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/14/2022.

Figure 23 High Priority Spot Improvements (Central Core)

# HIGH PRIORITY PEDESTRIAN SPOT IMPROVEMENTS

NORTH RICHMOND

TRAVEL SAFE RICHMOND

## PROPOSED PEDESTRIAN SPOT IMPROVEMENTS

- High-Priority Project
- Medium-Priority and Opportunity Projects

## EXISTING PEDESTRIAN FACILITIES

— Class I Shared-Use Path

## BOUNDARIES + DESTINATIONS

- BART Station
- Amtrak Station
- Ferry Terminal
- School
- City Hall
- Library
- Community Center
- Park
- Contra Costa College
- City Boundary



Sources: City of Richmond, MTC, Caltrans, and Contra Costa County. Document: Z:\Shared\PROJECTS\2021\00-2021-114 MTC VMT Reduction Plan\GIS\Projects\21-114\_MTC\_VMT\_ReductionPlan.aprx. Date saved: 12/14/2022.

Figure 24 High Priority Spot Improvements (North Richmond)

**Table 12** Pedestrian Projects by Prioritization Scores

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
2	Macdonald Ave	15th St	Crossing Improvement	Consider constructing a raised intersection or raised crosswalk at the eastern approach. Construct curb extensions at all four corners. Install high-visibility crosswalks at the eastern and western approaches on top of decorative paving.	81	High-Priority
26	Broadway	23rd St	Intersection Upgrade	Widen, lengthen, and channelize median islands. Restripe crosswalks as high-visibility crosswalks.	81	High-Priority
31	S 49th St	Cutting Blvd	Lighting	LRSP high-injury intersection,: install intersection lighting.	81	High-Priority
32	San Joaquin St	Central Ave	Crossing Improvement	LRSP high-injury intersection: construct bulb outs and install advanced warning signs.	81	High-Priority
19	Harbour Way	300' north of Chanslor Ave	Crossing Improvement	Install a high-visibility mid-block crosswalk with a median refuge island.	80	High-Priority
67	Broadway	24th St	Crossing Improvement	Construct curb extensions at all corners.	80	High-Priority
92	Central Ave	I-80	Crossing Improvement	Coordinate with Caltrans to upgrade all crosswalks to high-visibility crosswalks and provide leading pedestrian intervals for all crossing phases. Extend bicycle conflict markings on Central through the Jacuzzi intersection and interchange. Long term, construct curb extensions to tighten radii and square up approaches.	80	High-Priority
37	25th St	Macdonald Ave	Crossing Improvement	LRSP high-injury intersection: Upgrade all crosswalks to high-visibility. Consider installing RRFB or PHB. Construct curb extensions at all corners.	79	High-Priority
109	Macdonald Ave	Between 30th and 31st St	Crossing Improvement	Refresh the existing midblock crosswalk, install advance yield markings, and an RRFB. Construct curb extensions for the Macdonald crosswalk.	79	High-Priority
51	23rd St	Exchange PI	Crossing Improvement	Construct a median refuge island and install an RRFB for a crossing of 23rd Street.	78	High-Priority
66	Ohio Ave	S 23rd St	Crossing Improvement	Construct curb extensions at all corners.	78	High-Priority
93	Nevin Ave	Marina Way	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks and provide a leading pedestrian interval for call crossing phases. Long term, consider converting the intersection to a raised intersection.	78	High-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
1	Macdonald Ave	16th St	Intersection Upgrade	Consider scramble phase or otherwise don't allow permitted left turns to conflict with pedestrians in the crosswalk. Create leading pedestrian interval. Consider parklet on southwest corner.	77	High-Priority
15	Carlson Blvd	Bayview Ave	Intersection Upgrade	Install intersection improvements including curb extensions and a median nose.	77	High-Priority
20	S 23rd St	Virginia Ave	Crossing Improvement	Consider installation of a pedestrian refuge island and install pedestrian-scale lighting.	77	High-Priority
110	Macdonald Ave	San Pablo Ave	Intersection Upgrade	Study removal of the free-right turn lane and options to straighten crosswalks. Upgrade all crosswalks to high-visibility and provide a leading pedestrian interval for all crossing phases.	77	High-Priority
3	Nevin Ave	15th St	Crossing Improvement	Consider constructing a median refuge or traffic circle to accommodate direct pedestrian path of travel.	76	High-Priority
6	15th St	Nevin Ave	Bicycle Access	Provide a ramp to allow bicycle access to/from plaza.	76	High-Priority
7	Marina Way	Barrett Ave	Intersection Upgrade	Install a curb extension at the northwest and southwest corners. Provide a leading pedestrian interval and adjust pedestrian phase length to provide sufficient crossing times. Realign the southern crosswalk several feet south and install high-visibility crosswalks at the north and eastern approaches. Consider installing bicycle lane conflict markings and a two-stage bike turn box for NB-WB bike movements.	76	High-Priority
14	Carlson Blvd	Cutting Blvd	Intersection Upgrade	Construct intersection improvements including: formalized curb extensions, widened sidewalk, and additional sidewalks.	76	High-Priority
21	Harbour Way	Cutting Blvd	Crossing Improvement	Install curb extensions, directional ramps and high-visibility crosswalks, and median crossing islands.	76	High-Priority
22	Marina Way	Cutting Blvd	Crossing Improvement	Install curb extensions, directional ramps and high-visibility crosswalks and median crossing islands.	76	High-Priority

Table 12 Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
23	S 23rd St	Cutting Blvd	Crossing Improvement	Restripe crosswalks as high-visibility crosswalks. Install curb extensions at all corners with directional ramps. Construct median crossing islands.	76	High-Priority
49	23rd St	Barrett Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Install bicycle boxes at the 23rd Street approaches. Install curb extensions at both western corners.	76	High-Priority
50	23rd St	Macdonald Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Install bicycle boxes at the 23rd Street approaches. Install curb extensions at both western four corners.	76	High-Priority
52	Barrett Ave	BART Tracks	Sidewalk	Widen sidewalk on northern side through underpass (Requires road diet).	76	High-Priority
54	Cutting Blvd	S 12th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.	76	High-Priority
97	Macdonald Ave	45th St	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks and install advance yield markings. Install an RRFB for the Macdonald crosswalks. On the south side of the street, widen the sidewalk and provide a connection to the "Target Path."	76	High-Priority
104	22nd St	Macdonald Ave	Crossing Improvement	Install curb extensions at the northwest and northeast corners. Install a pedestrian count display at the southwest corner. When next repaved, reduce the intersection's crown and conform asphalt to the gutter pan.	76	High-Priority
106	Solano Ave	San Pablo Ave	Crossing Improvement	Refresh all crosswalks. Provide a leading pedestrian interval for all crossing phases. Construct curb extensions for the San Pablo crossings.	76	High-Priority
107	Barrett Ave	San Pablo Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Provide a leading pedestrian interval for all crossing phases. Mark a high-visibility across the northern approach. Construct transit-friendly curb extensions at all four corners. Install bicycle detection.	76	High-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
4	Barrett Ave	18th St	Crossing Improvement	Install the north, south, and west crosswalk legs as high-visibility. Install an RRFB or PHB for Barrett crossings (based on warrants). Add appropriate signs and advance pavement markings based on selected actuated crossing beacon.	75	Medium-Priority
16	Carlson Blvd	I-80 Undercrossing	Intersection Upgrade	Construct intersection improvements including: median refuge islands and curb extensions.	75	Medium-Priority
57	Cutting Blvd	S 21st St	Crossing Improvement	Upgrade all crosswalks to high-visibility.	75	Medium-Priority
18	Harbour Way	Bissell Ave	Crossing Improvement	Install curb extensions at all corners and restripe crosswalks as high-visibility.	74	Medium-Priority
5	Barrett Ave	19th St	Crossing Improvement	Stripe fourth crosswalk leg and upgrade traffic signal to include pedestrian countdown.	73	Medium-Priority
35	Macdonald Ave	21st St	Crossing Improvement	LRSP high-injury intersection. Upgrade all crosswalks to high-visibility. Consider installing an RRFB or PHB. Construct curb extensions at all corners.	72	Medium-Priority
64	Chanslor Ave	Espee Ave	Crossing Improvement	Install curb extensions at the two western corners to square up the intersection.	72	Medium-Priority
68	Broadway	Bissell Ave	Crossing Improvement	Install curb extensions at the northern and southwest corners to square-up the intersection. Realign and upgrade all crosswalks to high-visibility crosswalks. Install an RRFB for the Broadway crossing.	72	Medium-Priority
108	Macdonald Ave	28th St	Crossing Improvement	Upgrade the existing crosswalk to high-visibility and install advance yield markings and an RRFB. Construct curb extensions for the Macdonald crosswalk.	72	Medium-Priority
28	San Pablo Ave	Roosevelt Ave	Intersection Upgrade	Install curb extensions to tighten turn radii, and shorten crossing distances, Coordinate with Caltrans to study removing double right turn lane from San Pablo onto I-80 on-ramp.	71	Medium-Priority
55	Cutting Blvd	S 15th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.	71	Medium-Priority
59	Cutting Blvd	20th St	Crossing Improvement	Restripe the existing high-visibility crosswalks.	71	Medium-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
69	Broadway	26th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.	71	Medium-Priority
56	Cutting Blvd	S 18th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.	70	Medium-Priority
46	23rd St	Downer Ave	Crossing Improvement	Install a new high-visibility crosswalk across 23rd Street with an RRFB.	69	Medium-Priority
47	23rd St	Clinton Ave	Crossing Improvement	Construct a median refuge island and install an RRFB for the 23rd crossing.	69	Medium-Priority
48	23rd St	Grant Ave	Crossing Improvement	Install high-visibility crosswalks at all approaches.	69	Medium-Priority
63	Cutting Blvd	S 31st St	Crossing Improvement	Construct a pedestrian refuge island and install an RRFB/PHB.	69	Medium-Priority
65	Maine Ave	S 23rd St	Crossing Improvement	Install high-visibility crosswalks at all approaches and construct curb extensions at all corners.	69	Medium-Priority
58	Cutting Blvd	S 17th St	Crossing Improvement	Install high-visibility crosswalks at all approaches.	68	Medium-Priority
60	Cutting Blvd	S 24th St	Crossing Improvement	Construct a pedestrian refuge island; and install RRFB/PHB.	67	Medium-Priority
42	23rd St	Visalia Ave	Crossing Improvement	Install a new high-visibility crosswalk across 23rd Street. Install an RRFB at the crossing.	64	Medium-Priority
53	Barrett Ave	21st St	Crossing Improvement	Install a new high-visibility crosswalk at the western approach.	64	Medium-Priority
87	Virginia Ave	S 20th Street	Bicycle Access	Install a bicycle cut through in traffic divertor.	64	Medium-Priority
45	23rd St	Garvin Ave	Crossing Improvement	Improve accessibility features (push buttons, curb ramps, etc.) at all corners (more details in the CSSA). Install curb extensions at all corners and crosswalk landings. Upgrade crosswalks to high-visibility.	63	Medium-Priority
25	Harbour Way	Pennsylvania Ave/13th St	Intersection Upgrade	Install high-visibility crosswalks, and construct medians/channelized islands/curb extensions and advance stop bars. Consider slip lane removal.	62	Medium-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
62	Cutting Blvd	S 29th St	Crossing Improvement	Construct pedestrian refuge island and install RRFB/PHB.	62	Medium-Priority
111	Barrett Ave	Key Blvd	Crossing Improvement	Construct curb extensions (transit-friendly), install advance yield markings, and install an RRFB for the Barrett Avenue crossings.	62	Medium-Priority
27	Barrett Ave	I-80 Undercrossing	Intersection Upgrade	Coordinate with Caltrans to consider reconfiguring the through and turn lanes around the interchange. Coordinate with Caltrans to remove/trim vegetation around the off-ramp that blocks the visibility of pedestrians in the north crosswalk. Install a high-visibility crosswalk across the eastern approach.	61	Medium-Priority
38	23rd St	Lowell Ave	Crossing Improvement	Install a high-visibility crosswalk across the Lowell Ave approach. Upgrade curb ramps to current ADA standards.	61	Medium-Priority
43	23rd St	Esmond Ave	Crossing Improvement	Construct median refuge island and install an RRFB.	61	Medium-Priority
79	McBryde Ave	37th St	Crossing Improvement	Install curb extensions at all corners.	61	Medium-Priority
9	Ohio Ave	S 2nd St	Crossing Improvement	Potential for bike and pedestrian intersection improvements.	60	Medium-Priority
24	San Pablo Ave	McBryde Ave	Intersection Upgrade	Install curb extensions and ramps, and construct curb extensions so that streets intersect at right angles. Upgrade all crosswalk to high-visibility crosswalks.	60	High-Priority
29	S 45th St	Richmond Greenway Trail connection	Trail Access	Improve connections to trail connector ramp from 45th St	60	Medium-Priority
39	23rd St	Dunn Ave	Crossing Improvement	Construct median refuge island and install an RRFB.	60	Medium-Priority
44	23rd St	Gaynor Ave	Crossing Improvement	Install high-visibility crosswalks and an RRFB for the crossing of 23rd.	60	Medium-Priority

Table 12 Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
105	23rd St	Rheem Ave	Crossing Improvement	Upgrade all curb ramps to current best practices; specifically, replace the southwest corner ramp with a “parallel” ramp and “centered” ramps at the two eastern corners. Adjust pedestrian signal heads as needed. Provide a leading pedestrian interval for all crossing phases.	60	High-Priority
36	5th St	Barrett Ave	Crossing Improvement	LRSP high-injury intersection. Upgrade crosswalks to high-visibility. Consider installing an RRFB or PHB. Construct curb extensions.	59	Medium-Priority
41	23rd St	Andrade Ave	Crossing Improvement	Construct median refuge island and install RRFB.	59	Medium-Priority
17	Sacramento Ave	San Luis St	Crossing Improvement	Path crossing improvements: upgrade crosswalk to high-visibility and install advance yield markings. Consider installing RRFB.	58	Medium-Priority
40	23rd St	Hellings Ave	Crossing Improvement	Install high-visibility crosswalks and install an RRFB for the 23rd Street crossing.	58	Medium-Priority
89	Garvin Ave	San Pablo Ave	Crossing Improvement	Install high-visibility crosswalks at all intersection approaches. Provide a leading pedestrian interval with all crossing phases. Install bicycle conflict markings.	58	Medium-Priority
75	Hilltop Dr	Blumer Dr	Intersection Upgrade	Study removal of free-right turn lane.	56	Opportunity-Priority
8	Ohio Ave	Canal Blvd	Crossing Improvement	Refresh existing intersection markings, upgrade remaining crosswalks to high-visibility and provide a leading pedestrian interval.	55	Opportunity-Priority
70	McBryde Ave	Sonoma St	Crossing Improvement	Construct curb extensions.	55	Opportunity-Priority
96	Barrett Ave	25th St	Crossing Improvement	Upgrade the three existing crosswalks to high-visibility crosswalks and provide a leading pedestrian interval for all crossing phases. Install bicycle conflict markings through the intersection and consider other intersection treatments like bicycle boxes.	55	Opportunity-Priority
73	Hilltop Dr	Robert Miller Dr	Intersection Upgrade	Study removal free-right turn lanes.	54	Opportunity-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
101	I-580	Marina Bay Pkwy	Crossing Improvement	Coordinate with Caltrans to upgrade all crosswalks to high-visibility. At signalized crossings, provide a leading pedestrian interval for all crossing phases. At uncontrolled crossings, install RRFBs.	54	Opportunity-Priority
82	Maricopa Ave	26th St	Crossing Improvement	Install high-visibility crosswalks.	53	Opportunity-Priority
33	33rd St	Barrett Ave	Crossing Improvement	LRSF high-injury intersection. Construct curb extensions and install advanced warning signs and markings.	52	Opportunity-Priority
81	Maricopa Ave	28th St	Crossing Improvement	Install high-visibility crosswalks.	52	Opportunity-Priority
78	Garvin Ave	30th St	Crossing Improvement	Install high-visibility crosswalks and an RRFB for a crossing of Gavin Avenue.	51	Opportunity-Priority
94	Park Central St	Hilltop Dr	Crossing Improvement	Study intersection design changes to improve pedestrian crossings and accessibility. Improvements should include high-visibility crosswalks and curb extensions. Coordinate with property owners and other jurisdictions as required.	50	Opportunity-Priority
85	Maine Ave	S 16th St	Bicycle Access	Install bicycle cut through in traffic divertor.	49	Opportunity-Priority
86	Florida Ave	S 20th St	Bicycle Access	Install bicycle cut through in traffic divertor.	49	Opportunity-Priority
61	Cutting Blvd	S 26th St	Crossing Improvement	Construct pedestrian refuge island with an RRFB/PHB.	48	Opportunity-Priority
83	Tulare Ave	28th St	Crossing Improvement	Install high-visibility crosswalks.	48	Opportunity-Priority
90	Coalinga Ave	18th St	Crossing Improvement	Upgrade the two existing crosswalks to high-visibility and install high-visibility crosswalks at the northern and eastern approaches. Install advance stop markings at all approaches. Study intersection traffic control options with the design of the Coalinga Avenue bicycle boulevard.	48	Opportunity-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
95	Lucas Ave	7th St	Crossing Improvement	Upgrade the two existing crosswalks to high-visibility and install high-visibility crosswalks at the northern and eastern approaches. Build out the northeast corner to square up the intersection. Construct curb extensions at all corners.	48	Opportunity-Priority
74	Hilltop Dr	Shane Dr	Intersection Upgrade	Study removal of free-right turn lanes.	47	Opportunity-Priority
99	Center Ave	S 39th St	Wayfinding	Add wayfinding signs directing people walking and biking to the Richmond Greenway trailhead off of 39th Street.	47	Opportunity-Priority
13	Harbour Way	I-580 On and Off Ramps	Intersection Upgrade	Coordinate with Caltrans install high-visibility crosswalks and curb extensions at all corners.	46	Opportunity-Priority
10	Hoffman Blvd	Harbour Way	Crossing Improvement	Install high-visibility crosswalks and install curb extensions.	45	Opportunity-Priority
11	Wright Ave	Harbour Way	Crossing Improvement	Implement ADA accessible accommodations throughout the intersection, sidewalk and curbs.	45	Opportunity-Priority
91	Sutter Ave	Carlson Blvd	Crossing Improvement	SRTCP: Upgrade the existing southern crosswalk to high-visibility and install advance yield markings. Install transverse crosswalks at the eastern and western approaches with advance stop markings. Install an RRFB for the Carlson (southern) crosswalk. Consider building a refuge islands from the existing median.	44	Opportunity-Priority
76	Morningside Dr	Valley View Rd	Crossing Improvement	Install high-visibility crosswalks.	43	Opportunity-Priority
77	May Rd	Valley View Rd	Crossing Improvement	Upgrade crosswalks to high-visibility and install curb extensions.	43	Opportunity-Priority
71	Hilltop Dr	San Pablo Ave	Crossing Improvement	Construct curb extensions.	40	Opportunity-Priority
100	Meeker Ave	Marina Bay Pkwy	Crossing Improvement	Install a leading pedestrian interval for all crossing phases. Study removal of the free-right turn lane from the northwest corner. If removed, realign the west crosswalk to be parallel to Marina Bay Parkway. Due to the asymmetrical intersection and challenging site lines, consider providing a protected turn phase for northbound left traffic.	40	Opportunity-Priority

**Table 12** Pedestrian Projects by Prioritization Scores (Continued)

PROJECT ID	CROSS STREET	CROSS STREET	IMPROVEMENT	RECOMMENDATION	PRIORITIZATION SCORE	PRIORITIZATION CATEGORY
72	Hilltop Dr	Research Dr	Crossing Improvement	Construct curb extensions at all corners.	39	Opportunity-Priority
80	Esmond Ave	26th St	Crossing Improvement	Install high-visibility crosswalks.	39	Opportunity-Priority
30	Seacliff Dr	Seaview Dr	Crossing Improvement	LRSP high-injury intersection. Install crosswalk on northeast leg of intersection to connect to Class I path. Consider installing yield markings and radar speed feedback signs.	38	Opportunity-Priority
88	29th St/Vale Rd	Howard St/ Salesian Ave	Crossing Improvement	Study locations for a marked crossing of 29th/Vale, including one block south at Moran Avenue. Coordinate with City of San Pablo as necessary.	37	Opportunity-Priority
103	38th St	Boyd Ave/ Solano Ave	Crossing Improvement	Upgrade all crosswalks to high-visibility crosswalks. Install advance yield/stop marks where appropriate. Long term, study additional park access improvements include converting Boyd to one-way, curb extensions, and other traffic calming measures.	36	Opportunity-Priority
84	Solano Ave	Amador St	Crossing Improvement	Install curb extensions at all corners.	35	Opportunity-Priority
102	Sea Cliff Dr	Canal Blvd	Crossing Improvement	Trim vegetation around stop sign to improve visibility. Consider adding street lighting to this intersection. Upgrade the existing crosswalk to high-visibility.  Coordinate with the Port to trim vegetation along Sea Cliff Drive.	35	Opportunity-Priority
12	1000' north of Hall Ave	Harbour Way	Crossing Improvement	Coordinate with railroad operator to install pedestrian railroad crossing gates, Implement ADA accessible accommodations throughout the intersection, sidewalk, and curbs.	30	Opportunity-Priority
98	McBryde Ave/ Park Ave	Marin Ave	Crossing Improvement	Study intersection redesign options to improve driver and pedestrian visibility at all intersection approaches. Study should look at crossing, visibility/site lines, and intersection control changes.	28	Opportunity-Priority
34	Atlas Rd	Oakmont Dr	Crossing Improvement	LRSP high-injury intersection. Construct curb extensions and install advanced warning signs and markings, Consider installing an RRFB or PHB for the Atlas Road crossing.	27	Opportunity-Priority

## Active Projects

**Table 13** lists the active transportation projects Richmond is working on. The projects are listed with their current status.

The City of Richmond have applied and are considering applying for funding through a number of different grants, including:

- One Bay Area Grant
- Highway Safety Improvement Program Grant
- Transformative Climate Communities Grant
- Clean California Grant
- California Active Transportation Program
- Safe Streets for All Grant
- Urban Greening Grant
- Sustainable Transportation Planning Grant
- Transportation Development Act Grants
- Transportation for Livable Communities Grants

In addition to these competitive grant programs, the City has also had success implementing projects using paving funds from SB1 and using developer fees. The number of projects the City can concurrently develop varies based on a number of factors, including staff capacity, project complexity, and project funding.

The project prioritization process and results discussed in the prior section is intended to guide the City's limited resources to which project should be implemented first. The following Project Funding section will help the City understand planning-level project costs and provides a detailed list of funding opportunities.

**Table 13** Current Active Transportation Projects

PROJECT NAME	STATUS
Carlson Crosstown Connection	Construction
Cutting-Hoffman-Harbour Bikeway	Construction
Yellow Brick Road	Construction
13th Street Complete Streets	Design
Harbour/Wright Section 130 Railroad Crossing Improvement	Design
I-80/Central Phase II	Design
Lincoln Elementary Safe Routes to School	Design
Point Molate Bay Trail	Design
San Pablo Multimodal Corridor Study (WCCTAC)	Study
Cutting Blvd Section 130 Phase II Railroad Crossing Improvement	Funded
Ferry to Bridge to Greenway-Castro to Cutting	Funded
Richmond Wellness Trail Phase II	Funded
Harbour Way Complete Streets	Funded
7th Street Sidewalk Gap Closure	Funded

## Project Funding

The bicycle and pedestrian improvement projects in the BPAP will require funding for design (i.e., detailed engineering work) and construction. bicycle and pedestrian improvement projects is available at all levels of government (local, regional, state, and federal) and from private sources. Project funding can take the form of competitive grants, formula-based allocations, tax measure-based funding, funds from private development, and others. [Appendix C](#) provides a detailed list of potential funding sources with a brief description.

**Table 14** summarizes the type of projects and project phases (planning, design, construction) that each funding opportunity listed in [Appendix C](#) will fund.

## Planning Level Cost Estimates

**Table 15** provides high and low planning level cost estimates for each class of bicycle facility. **Table 16** provides the same information for different types of spot improvements. Cost estimates include 30% extra for “soft costs” (items like City staff time and other administrative-related work). These are order of magnitude planning budgetary figures; a complete detailed engineering design will be needed to determine the most probable cost of individual projects.



Table 14 Funding Opportunities by Project Type

FUNDING SOURCE	FUNDING FOR PLANNING (P), DESIGN (D), OR CONSTRUCTION (C)	ON-STREET BIKEWAYS/ END-OF-TRIP	TRAILS	SAFE ROUTES TO SCHOOL	SAFE ROUTES TO TRANSIT	CROSSINGS/ INTERSECTIONS	PROGRAMS	STUDIES
<b>LOCAL AND REGIONAL OPPORTUNITIES</b>								
Contra Costa County Measure J (CCTA)	P/D/C	•	•	•	•	•	•	
Transportation Fund for Clean Air, County Program Manager Fund (CCTA)	C	•	•	•	•			
511 Contra Costa Bike Rack and Locker Program (Contra Costa County)	C	•						
One Bay Area Grants (MTC)	D/C	•	•		•			
Transportation Development Act Article 3 (CCTA)	D/C	•	•	•	•	•		
Bicycle Facilities Grant Program (BAAQMD)	C	•						
Climate Initiatives Innovative Grants (MTC)	-					•		
New Developments/Resurfacing Projects (Richmond)	D/C	•	•			•		
Assessment Districts (Richmond)	P/D/C	•	•	•	•	•	•	•
Impact Fees (Richmond)	P/D/C	•	•	•	•	•	•	•
<b>STATE AND FEDERAL OPPORTUNITIES</b>								
Active Transportation Program (CTC)	P/D/C	•	•	•	•	•	•	•
Sustainable Transportation Planning Grants (Caltrans)	P							•
Highway Safety Improvement Program (Caltrans)	D/C	•	•	•	•	•		
Solutions for Congested Corridors (CTC)	C	•	•			•		
Office of Traffic Safety (CA OTS)	-						•	

**Table 14** Funding Opportunities by Project Type (Continued)

FUNDING SOURCE	FUNDING FOR PLANNING (P), DESIGN (D), OR CONSTRUCTION (C)	ON-STREET BIKEWAYS/ END-OF-TRIP	TRAILS	SAFE ROUTES TO SCHOOL	SAFE ROUTES TO TRANSIT	CROSSINGS/ INTERSECTIONS	PROGRAMS	STUDIES
Recreational Trails Program (CA DPR)	C		•					
Affordable Housing & Sustainable Communities (CA HCD)	C	•			•		•	
Urban Greening Grants (CA NRA)	C	•	•	•	•			
Statewide Park Program (CA DPR)	C	•	•					
RAISE Grants (USDOT)	P/D/C	•	•	•	•	•		•
Congestion Mitigation and Air Quality (Caltrans and MTC)	C	•	•	•	•	•		
Surface Transportation Block Grants (Caltrans and MTC)	C	•	•	•	•	•		
<b>OTHER STATE FUNDS</b>								
Local Partnership Program (CTC)	C	•		•	•	•		
Road Maintenance and Rehabilitation Program (Controller's Office)	D/C	•		•	•			

**Table 15** Planning Level Cost Estimates by Bikeway Classification

BIKEWAY CLASSIFICATION	COST PER MILE		ASSUMPTIONS
	LOW	HIGH	
Class I - Shared-use Path	\$500,000	\$1,500,000	Cost includes asphalt path and minor crossing improvements. Cost does not include signal modification or right-of-way acquisition.
Class II - Bicycle Lane	\$50,000	\$350,000	Low cost assumes signage and striping. High cost assumes green conflict marking, and traffic signal modification, including bike signal detection.
Class IIB - Buffered Bicycle Lane	\$100,000	\$400,000	Low cost assumes signage, striping, and a painted buffer. High cost assumes green conflict marking, traffic signal modification (including bike signal detection), and wayfinding signage.
Class III - Bicycle Route	\$15,000	\$25,000	Cost includes signage and striping.
Class IIIB - Bicycle Boulevard	\$70,000	\$1,000,000	Low cost assumes signage, striping, and minor traffic calming (such as speed humps and up to three other elements such as medians, diverters, or a raised crosswalk). High cost assumes low-cost items plus traffic circles, curb extensions, traffic signal modification (including bike signal detection), and wayfinding signage.
Class IV - Separated Bikeway	\$300,000	\$1,500,000	Low cost assumes signage, striping, and a painted buffer with flexible delineators. High cost assumes green conflict marking, traffic signal modification (including bike signal detection), and a raised concrete buffer.

Please note that all costs are based on values obtained from Bid Documents of local (i.e., Contra Costa, Alameda, Santa Clara, and San Mateo counties) projects from 2019 to present, or historic planning level costs generated for local planning efforts from 2018 to present. Values derived from Bid documents were multiplied by a planning level contingency factor to account for additional project needs not explicitly stated in the descriptions. Costs include the cost of materials, labor and administration of the identified facilities and items, and do not include design fees, public outreach efforts, or inter-agency coordination.

**Table 16** Planning Level Cost Estimates by Pedestrian Spot Improvement Project

FACILITY TYPE	COST	UNIT	NOTES
Signage	\$500	Each	
Pavement Markings (stop/yield)	\$2,000	Each	
Transverse crosswalk	\$3,000	Each	Transverse crosswalk
High-visibility crosswalk	\$4,000	Each	High-visibility crosswalk
Curb Ramps	\$15,000	Each	Assumes no drainage relocation
Red Curb Paint	\$26,500	Per Mile	
Wayfinding Signs	\$30,000	Per Mile	
Curb extensions/Corner Radii	\$50,000	Each	Varies by size and assumes no drainage relocation
Median Refuge Island	\$50,000	Each	Varies by size
Median (short)	\$50,000	Each	
Rectangular Rapid Flashing Beacon (RRFB)	\$60,000	Each	
Leading Pedestrian Interval	\$100,000	Each	Cost varies based on the cost of existing and required equipment
Slip Lane (free-right turn lane) Removal	\$100,000	Each	Varies by size
Pedestrian-only Signal Phase	\$100,000	Each	Cost varies based on the cost of existing and required equipment
Neighborhood Traffic Circle	\$150,000	Each	
Pedestrian Hybrid Beacon (PHB)	\$400,000	Each	
Protected Intersection	\$500,000	Each	
Sidewalk	\$500,000	Per Mile	Six-foot wide sidewalk on one side of the street

Please note that all costs are based on values obtained from Bid Documents of local (i.e., Contra Costa, Alameda, Santa Clara, and San Mateo counties) projects from 2019 to present, or historic planning level costs generated for local planning efforts from 2018 to present. Values derived from Bid documents were multiplied by a planning level contingency factor to account for additional project needs not explicitly stated in the descriptions. Costs include the cost of materials, labor and administration of the identified facilities and items, and do not include design fees, public outreach efforts, or inter-agency coordination.

## Active Transportation Supportive Programs and Policies

The following set of policies and programs should be considered to support the implementation of the proposed improvements in this plan. These policies and programs will be subject to additional community engagement to understand community support, funding availability, and allocation to determine how they can be implemented. Further discussion and refinement will also be needed to determine any required changes to the municipal code and who the implementing/enforcement department should be.

Internal departmental coordination over the next two years is also recommended to further develop and evaluate the rollout and implementation of said policies and programs.

### Maintenance

Timely and regular maintenance of bicycle facilities, shared-use paths, trails, and sidewalks are critical for their continued safe and comfortable use. Inadequately maintained facilities can create potentially hazardous conditions and reduce the accessibility and connectivity of the bicycle and pedestrian networks. Providing safe, accessible, comfortable, and well-maintained walking, bicycling, and rolling facilities allows such active transportation to be a viable

travel option. Prioritizing the procurement of new equipment for conducting regular maintenance and sweeping on new facilities such as separated bikeway lanes will benefit the City's active transportation long-term goals by encouraging people bicycling and walking to use these well-maintained facilities. The following section includes maintenance policies that the City will endeavor to meet based on ongoing constraints such as staffing and funding:

### Sidewalk Repair and Maintenance

The City has an established and codified sidewalk repair and maintenance program. Richmond's Municipal Code (12.36.025) states that property owners are responsible for the repair and maintenance of sidewalks (and all associated costs) for sidewalks adjacent to their property. To help reduce the burden on low-income homeowners and encourage more rapid repairs, the City should consider the following actions:

- Conduct a citywide sidewalk inventory to understand where missing and broken sidewalks exist. This study could also include an inventory of curb ramps and other accessibility treatments.



*Green conflict markings help all roadway users know about upcoming potential conflicts between people bicycling and driving near intersections.*

- Develop requirements that sidewalks be repaired when properties are sold, homeowners file for specific permits, or other conditions.
- Educate residents, homeowners, and businesses about their sidewalk repair and maintenance responsibilities.
- Develop a program to coordinate with property owners to trim and maintain overgrown vegetation.
- Provide subsidies or other financial assistance for sidewalk repairs to reduce the financial burden for lower-income homeowners.
- Adjust City standards and design guidelines to use sidewalk-friendly tree species (trees with roots that won't affect the sidewalk) where appropriate.



*Tree roots have uplifted this segment of sidewalk, creating an uneven walking and rolling path.*

### Closing Sidewalk Gaps

After completing the citywide sidewalk inventory mentioned previously, the City should develop a prioritization process to rank the sidewalk gaps by importance and gradually work toward addressing all gaps across the city. The currently available sidewalk gap data (see **Figure 02**, [page 8](#)) can serve as a starting point until funds for the full inventory have been allocated.

### Sidewalk Access

Community feedback indicated that one of the most frequent types of pedestrian issues is the obstruction of sidewalks by parked vehicles (see **Figure 02**, [page 8](#)). This includes vehicles that have been driven onto the sidewalk, vehicles that have been partially parked off street on private property, and vehicles overhanging into the sidewalk from a driveway. The City should

consider the development of policies to educate the public on the importance of keeping sidewalks clear of obstructions and not blocking the sidewalk, including legality, access, and safety.

*NOTE: the data contained in Figure 02 (see [page 8](#)) is not an exhaustive inventory of existing/missing sidewalks. The data has been compiled by City staff based on internal knowledge and feedback received from the community.*

## Maintenance Policies

The City should consider the implementation of the following policies to maintain the bicycle and pedestrian network in a state of good repair, high usability, and accessibility. Implementation of all maintenance policies is subject to sufficient allocation of staff, capital, and funding resources.

### Policy 1: Identify all maintenance stakeholders across City of Richmond Departments and partner agencies/ jurisdictions.

- A.** Regularly coordinate to establish and update maintenance needs across the City and share resources when possible and practical.
- B.** Create a facility inspection schedule to inspect facilities and update maintenance priorities regularly.

### Policy 2: Maintain designated walking and bicycling facilities to be safe, comfortable, accessible, and usable for walking, bicycling, and rolling.

- A.** Sweep streets regularly with priority given to roads with higher pedestrian and bicycle traffic volumes.
- B.** Ensure Richmond Public Works has all necessary equipment to maintain all facility types, including trails and separated bikeways.
- C.** Develop a schedule to sweep separated bikeways regularly.

- D.** Trim overhanging vegetation and work with appropriate property owners to maintain a clear path of travel along pedestrian and bicycle facilities. Consider working with neighborhood councils and community groups to help maintain vegetated pieces of infrastructure.
- E.** Develop and implement an appropriate minimum paving surface standard for bicycle boulevards and other low-stress bikeways that maintain a higher safety and comfort level for active transportation users.
- F.** Update the City's repaving project methodology to prioritize bicycle boulevards and other low-stress bikeways to maintain the minimum paving surface standard.
- G.** Incorporate maintenance needs into the design of separated bikeways and other facilities to ensure proper maintenance after construction.
- H.** Develop a construction mitigation policy for impacted pedestrian and bicycle facilities requiring City staff and contractors to create fully accessible detours of equivalent standards, where possible, when construction, maintenance, or other activities restrict the use of bikeways and walkways.

### Policy 3: Maintain bicycle parking and other support facilities for a more comprehensive bicycle network.

- C.** Develop a procedure for inspection and prompt repair/replacement of damaged bicycle racks or other facilities in the public right-of-way.
- D.** Encourage public event organizers to provide and publicize valet bicycle parking at special events. Amend the City's event permitting process to include bicycle access accommodations and parking as part of necessary traffic control provisions.

### Policy 4: Develop a communications protocol for walking, bicycling, or rolling-related updates.

- A.** Regularly update digital and printed bicycle and trail network maps. Distribute paper maps at libraries, community centers, bike shops, and other locations.
- B.** Promote Richmond's eTRAKiT service as an easy-to-use method for the public to report maintenance and other facility issues.



*A Quick-build curb extensions in Oakland near the Lake Merritt BART Station.*

## Quick-Build Project Alternatives

Many infrastructure improvements (especially pedestrian projects and intersection geometry changes) can be completed using signage, striping, and other quick-build strategies. Facilities like curb extensions, medians, and separated bikeways are examples of treatments that can be built with quick-build materials. These

improvements can be left permanently with the quick-build materials or used as a short-term improvement until additional funding for design and construction can be secured for permanent, more expensive design installations. Constructing improvements with quick-build materials can result in more immediate safety and comfort enhancements at lower costs. Using quick-build materials

also allows the City to trial design changes before committing to long-term investments.

There are many resources available online that describe quick-build projects in more detail. The California Bicycle Coalition has an [80-page guide](#) with details on how to move forward with these low-cost, high-impact project types.



*“Black Lives Matter” text painted on Nevin Avenue in front of Richmond City Hall.*

## Public Art

Public art is a crucial component of placemaking and allows community members to help establish and reinforce a public identity. Public art can take many forms, including sculptures, murals, decorative crosswalks, painted curb extensions, and themed street furniture. Public art can also help create a more welcoming and engaging environment to walk, roll, and bike through; helping to encourage more people to use active transportation. Public art can be coordinated through the City’s Public Art Advisory Commission and the Richmond Arts and Culture Commission.

The City should work to include public art and placemaking elements wherever possible with active transportation projects.

## Next Steps

### Project Timing and Funding

Projects can take a long time to get from “a line on a map” to being fully constructed. Limited staff time and limited City resources may constrict how many projects can move forward at a given time and how fast those projects move. In some cases, funding for project phases (planning, engineering design, and construction) is found separately, sometimes with years between phases. As the City wins competitive grants, it may take one to two years for the City to get access to those funds to continue moving the project forward. The realities of active transportation funding strengthen the importance of project prioritization to guide City staff in selecting projects that will provide the most significant safety and overall community benefits.

## Active Transportation Progress Reports

This plan recommends City staff present updates on current active transportation projects, grant opportunities, recent community feedback, and other relevant updates to the City Council, Bicycle and Pedestrian Advisory Committee, and the Richmond Neighborhood Coordinating Council biannually.

## Partner Entities

The City of Richmond is not the only jurisdiction or entity responsible for planning, designing, and constructing walking, bicycling, and rolling facilities across the City. Some of the bicycle and pedestrian improvement project recommendations in the BPAP are in the rights-of-way of other agencies, jurisdictions, or private owners, such as Caltrans, Contra Costa County, or Union Pacific Railroad. The City will coordinate with the appropriate stakeholders for planning, design, funding, and implementation. These partner agencies may have final approval on these projects, even if they are located within the City of Richmond. Examples of projects out of the City’s right-of-way include trails on railroad company property, bicycle facilities on Caltrans-operated roads, or pedestrian crossing improvements at interchanges.

### What Projects Move Forward Next?

Given the limited amount of staff time and budget for new projects, several factors will impact which projects move forward and when. **Figure 25** shows the development and implementation process for projects in the BPAP.

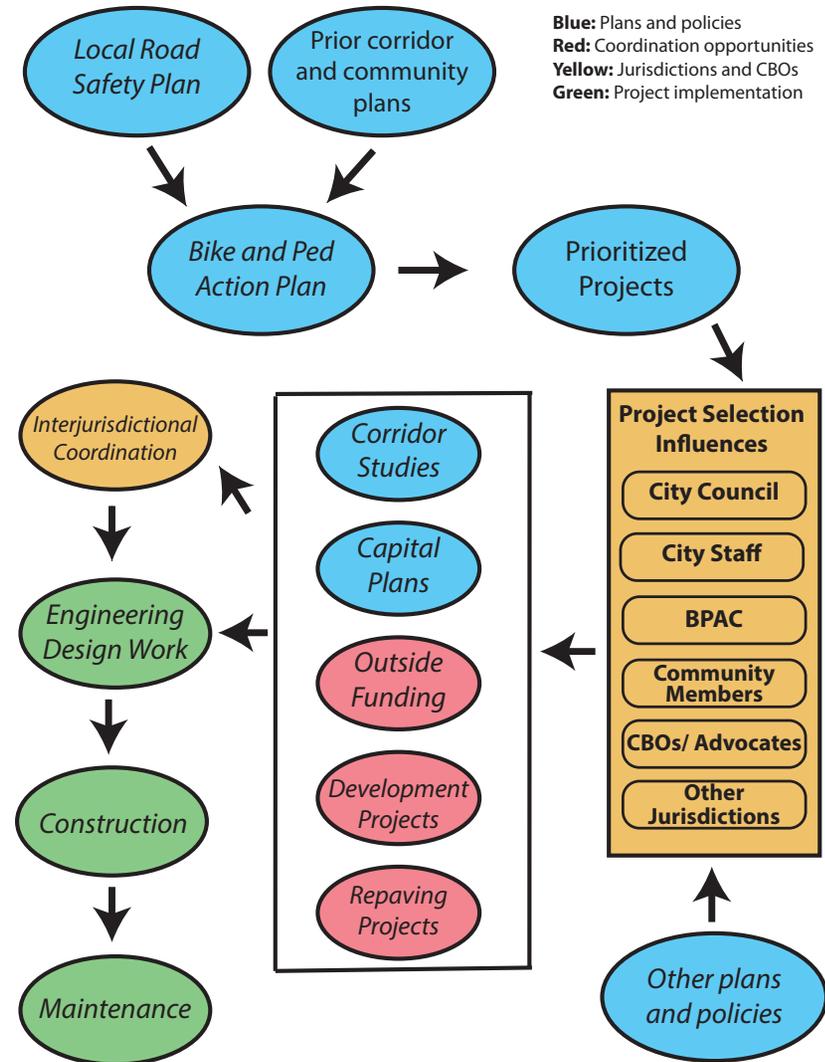
### Focusing on Safety

Throughout the community engagement process, community members consistently stated that improving safety was their top priority. Travel Safe Richmond analyzed collision histories across the City and developed recommendations that responded to those locations. Additionally, safety was one of the major components of the project prioritization process (one-quarter of possible priority points).

When seeking funding sources, many competitive grants have collision history as a score factor. Some grants, including the Highway Safety Improvement Program (HSIP) and those from the Office of Traffic Safety (OTS), focus on responding to collision locations and other safety concerns.

### Interpreting Prioritization Results

The overall prioritization rankings provide an order of projects that can improve safety and benefit the community. Overall project rankings can help select projects for Active Transportation Program (ATP) grant applications or for projects to add to the City’s next Capital Improvement Plan (CIP). Breaking down the scores of the different inputs can provide guidance for more specific needs. For example, City staff could sort projects by order of the “safety” score to find the best projects for HSIP or OTS grants. The rankings are not intended to be a hardened list but rather a guide for staff to select projects based on a variety of factors that present opportunities to move projects forward.



**Figure 25** Implementation Process Flowchart

## How Can the Community Stay Involved?

Staying informed and involved is one of the best ways to continue to advocate for your community and show support for the bicycle and pedestrian improvement projects that matter to you most. There are multiple ways you can get involved:

### Attend Bicycle and Pedestrian Advisory Committee Meetings

The Bicycle and Pedestrian Advisory Committee (BPAC) meets monthly to discuss current and future bicycle and pedestrian improvement projects and needs. City staff present updates, and there are opportunities for public comment. If you don't have time to attend, checking the [BPAC website](#) is also a great way to stay informed.

### Get Involved with Your Local Neighborhood Council

Neighborhood councils are great ways to meet your neighbors and stay informed about different happenings in your area. Neighborhood councils receive presentations and updates from City staff on projects and other issues. You can find your neighborhood council on the [City's website](#). From the main page, type "Neighborhood Council" in the search bar.

### Get Involved with Local Walking and Biking Organizations

Supporting local community and advocacy groups like [Rich City Rides](#) and [Bike East Bay](#) is another way to advocate for bicycle and pedestrian improvement projects in your community. These groups focus on advocating for safer roads and getting more people walking and bicycling. Your membership and support will help grow their advocacy and education work on behalf of the community.



Appendix

# A

# Plan Review Summary





To: Kara Oberg, MTC; Denee Evans, Lina Velasco, Patrick Phelan; City of Richmond  
From: Mauricio Hernández and Ben Frazier, Alta  
Date: September 29, 2022  
Re: Richmond Bicycle and Pedestrian Infrastructure Action Plan – Plan Review Summary

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## Introduction

This memorandum summarizes local and regional plans, policies, and standards that impact active transportation in the City of Richmond. These planning documents were reviewed to better understand existing conditions and the results of prior planning efforts in Richmond as it pertains to walking, biking, rolling, and accessing public transportation. This document provides a foundation for the development of the Richmond Bicycle and Pedestrian Infrastructure Action Plan. The document was adapted from the Plan Review summary developed for the City’s Local Roadway Safety Plan.

The document is divided into three sections:

**Section 1** – Introduction: provides an overview of the memo and included information

**Section 2** – Key Takeaways: consists of a high-level summary of common themes identified within the plans reviewed.

**Section 3** – Document Review and key takeaways: contains a complete overview of the 14 documents reviewed.

The following documents were reviewed as part of this memo:

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Richmond General Plan</li><li>• Richmond Bicycle Master Plan</li><li>• Richmond Pedestrian Plan</li><li>• 23rd Street Streetscape Improvement Plan</li><li>• Rumrill/13th Street Complete Street Study</li><li>• South Richmond Transportation Connectivity Plan</li><li>• Yellow Brick Road Iron Triangle Walkable Neighborhood Plan</li><li>• Richmond Wellness Trail Study</li></ul> | <ul style="list-style-type: none"><li>• First Mile/Last Mile Transportation Strategic Plan</li><li>• Harbour Way Complete Streets</li><li>• Ferry to Bridge to Greenway Complete Streets Plan</li><li>• BART Walk and Bicycle Network Gap Study</li><li>• Contra Costa Countywide Bicycle and Pedestrian Plan</li><li>• Richmond Area Community-Based Transportation Plan</li></ul> |
|---|---|

## Key Takeaways

Over the past several years, the City has developed numerous citywide plans that set safety-focused policies and goals. Richmond has also developed corridor plans that include multimodal access and safety recommendations for specific corridors and area plans that prioritize improvements across broader regions. Contra Costa Transportation Authority (CCTA) develops countywide plans that support the City of Richmond’s efforts and work towards unified regional connectivity at the county level. In general, many of the documents reviewed emphasize the need for a transportation system that supports safe, comfortable, and equitable transportation networks for vulnerable users (e.g., people walking, biking, and rolling – especially youth, seniors, and those with limited physical mobility or limited mobility options). Major themes throughout the documents reviewed included:

- Need for improving safety and comfort of all users
- Need for improving connectivity and access to multimodal transportation networks under a more equitable approach
- Need to enhance connectivity to neighboring jurisdictions
- Need to standardize implementation of Active Transportation facilities and networks
- Need to improve quality of life by focusing on improving health (personal, environmental, and economic)
- Commitment to encourage and promote walking and bicycling as viable modes of transportation

Future recommendations included in the Richmond Bicycle and Pedestrian Infrastructure Action Plan will consider these key themes and the infrastructure recommendations made in the plans reviewed for this memorandum.

## Document Review

The following sections summarize previous citywide plans, corridor and area plans that recommend and guide transportation safety improvements in Richmond.

### Richmond General Plan (2012)

The Circulation Element of the Richmond General Plan (2012) provides a vision and policy framework for transportation planning in Richmond. Richmond has a robust multimodal transportation environment that can foster trips across various travel modes: walking, bicycling, rolling (skating, scooting, or using mobility devices), public transportation (bus, commuter rail, heavy rail, and ferry), and driving. In this vision, the City’s transportation network strives to balance the efficiency and needs of all modes of travel, with traffic calming, dedicated bicycle facilities, trails, and sidewalks supporting safe and comfortable conditions for all modes, especially people walking, bicycling, and rolling.

The Circulation Element outlines a place-based circulation classification system tailored to surrounding land use, street function, and desired character. This classification system assigns modal priorities to each accessway type and provides design recommendations for each one. While the General Plan does not include a transportation safety analysis, policies and actions in the Circulation Element set safety as a high priority:

- Policy CR1.5 calls for safe and convenient walking and bicycling.
- Action CR1.C calls for the development and implementation of Bicycle and Pedestrian Plans.
- Policy CR3.1 focuses on safety and accessibility, with a focus on walking, bicycling, and transit. The policy also emphasizes at-grade railroad safety, with a dedicated action item for rail crossing improvements.
- Action CR3.B calls for traffic calming on streets that experience speeding or cut-through traffic.
- Action CR2.F: calls for the city to explore the potential to lower speed limits around schools, parks, and other public gathering spaces.

In addition to safety-focused policies and actions, the General Plan also included ones that focus on improving conditions for active transportation users:

- Policy CR1.1: encourages multiple circulation options and equitable transit access/service throughout the City.
- Policy CR1.2: calls for interconnected streets that adequately serve the needs of all roadway users.
- Policy CR1.3: calls for enhanced linkages within Richmond and beyond to neighboring cities and areas and improved connections to public transportation.
- Policy CR1.6: calls for a comprehensive network of multi-use trails throughout the City and region.
- Action CR1.E: calls for expanded multi-use trails and greenways within Richmond to improve connections to existing and future trails and improve connectivity to trails from more neighborhoods across the city.
- Action CR1.K: calls for the development of station area plans around major transit hubs, including improving active transportation connectivity.
- Policy CR2.1: calls for improved access and connectivity within neighborhoods and to major destinations in the City.
- Policy CR2.2: calls for mixed-use urban streets designed with complete street policies that balance the needs of all roadway users.
- Action CR2.B: calls for the city to work with school districts, transit providers, and other partners to develop a Safe Route to School Program.

## **Richmond Bicycle Master Plan**

The City of Richmond Bicycle Master Plan (2011) set forth the blueprint for developing and implementing bikeways and support facilities within the City of Richmond. The Plan focused on improving inter-and intra-neighborhood connectivity, safe routes to schools, and access to major destinations such as employment centers, stores and shops, parks, trails, and open space areas.

The Bicycle Master Plan outlines four main goals, with Goal 3 focused on making Richmond’s streets safer for bicyclists, both during the day and at night. Goal 1 calls for the expansion of bicycle facilities and parking facilities. Goal 2 calls for the city to increase the number of people of all ages and backgrounds bicycling for any trip purpose. In the network development and prioritization, safety was worth three out of twenty points, scored based on the number of previous bicycle collisions per mile.

The Bicycle Plan proposed over 104 miles of bikeways (30 miles of Class I, 32 miles of Class II, and 42 miles of Class III). Bicycle recommendations are concentrated in three focus areas: Hilltop, Central Richmond, and El Sobrante. Since 2011, 24 miles of bike facilities have been installed in Richmond. While the high priority corridors all received bikeway project recommendations in the Bicycle Master Plan, new design best practices including Class IV bikeways are not reflected in the network. Key hot spot corridors have also undergone in-depth safety and Complete Street studies, including Harbour Way, Rumrill/13th Street, and 23rd Street.

## **Richmond Pedestrian Plan**

Completed in 2011, the Richmond Pedestrian Plan aimed to improve the safety, convenience, and appeal of walking throughout the City. Central Richmond, comprised of Downtown, Civic Center, transit center, and several historic mixed-income and low-income neighborhoods, is the Plan's focus. The Pedestrian Plan includes goals to improve safety, security, connectivity, equity, health, sustainability, and help revitalize neighborhoods and downtown Richmond.

The Plan included a safety and connectivity analysis with criteria for project prioritization focusing on proximity to Pedestrian Improvement Districts (General Plan), community connectivity, safety, and ease of implementation. Top-tier projects from the Richmond Pedestrian Plan included Marina Way, Nevin Avenue, the Richmond Greenway, South 23<sup>rd</sup> Street, Barrett Avenue, 6<sup>th</sup> Street, Ohio Avenue, and Harbour Way.

The Pedestrian Plan also included a Crosswalk Policy, treatment toolbox, action plan, and roundabout concept for Cutting Boulevard at Carlson Boulevard.

### **Crosswalk Policy/Treatment Toolbox**

Richmond’s crosswalk policy included an escalating hierarchical scale of crossing enhancements, starting with marking crosswalks and advance stop/yield markings; next, curb extensions/curb radii changes, followed by Rectangular Rapid Flashing Beacons (RRFBs)/Pedestrian Hybrid Beacons (PHBs) and similar treatments; followed by signals and grade separation.

The pedestrian toolkit included infrastructure treatments like complete streets/road diets/right-sizing roadways, curb radii changes/curb extensions, neighborhood traffic circles/roundabouts, crossing improvements, street lighting, crossing islands, sidewalk improvements, street trees, and others.

## **Corridor and Area Plans**

The following corridor and area plans expand on the goals from citywide plans and develop more specific improvement recommendations throughout the City.

### **23<sup>rd</sup> Street Streetscape Improvement Plan**

The 23rd Street Project Report (2009) focused on a one mile stretch of 23rd Street and 22nd Street within the City of Richmond, between the Carlson Boulevard over-crossing at the south to Costa Avenue at the north and 22nd Street between the Carlson Boulevard over-crossing at the south to the Brooks Avenue crossover. The 23rd Street corridor hosts a major commercial district and provides a north-south arterial connection between Richmond and San Pablo and Interstate 580.

The recommended improvements outlined in the report aim to promote pedestrian and bicycle safety along the corridor by reducing the number of travel lanes, widening the sidewalks, shortening crossing distances for pedestrians, and improving overall pedestrian and bicycle visibility. The preferred alternative includes parallel vehicle parking and a Class III bike route along the corridor. Sidewalk improvements also include reallocation of space to include an amenity zone, through zone, and café seating zone. The 23<sup>rd</sup> Street project has not been funded for construction.

### **Rumrill/13<sup>th</sup> Street Complete Street Study**

The Rumrill Boulevard and 13<sup>th</sup> Street Complete Streets Study (2015) was developed through an intensive community-based design process focused on transforming the street into a safe and friendly place for people and businesses by improving walking, bicycling, and transit conditions. Both the Cities of San Pablo and Richmond and community members of adjacent neighborhoods identified Rumrill Boulevard/13th Street as a corridor in need of a safety, comfort, and placemaking vision for the corridor. The Study area covered those two streets between Harbour Way/Pennsylvania Avenue in Richmond and San Pablo Avenue in San Pablo. The Study identified existing conditions, documented alternatives development for corridor-wide improvements, and provided a preferred concept alternative for the community's complete streets vision for the corridor.

Because of safety concerns along the corridor, resulting from limited crossing opportunities and perceptions of speeding traffic, the Study included a detailed analysis of pedestrian conditions, including a collision history report. The final preferred concept for Rumrill/13<sup>th</sup> Street included a lane reduction with space reallocated to pedestrian, bus riders, and bicycle improvements. Other improvements called for shorter crosswalk distances, sidewalk repair, implementation of Class IV or cycle tracks, bus shelters, and far side bus stops. The project has been funded for construction in Richmond and San Pablo; construction is expected to be completed in the near future.

### **South Richmond Transportation Connectivity Plan (SRTCP)**

The South Richmond Transportation Connectivity Plan (2015) identified deficiencies in the existing transportation system, with a specific focus on critical transportation corridors in South Richmond. The Plan set forth recommendations to improve multimodal connectivity to and within the area, while strengthening businesses and neighborhoods, to overcome highway and railroad barriers. Key objectives of the SRTCP included connecting South Richmond Neighborhoods to opportunities for employment, education, and recreation on the South Shoreline. The plan also called for connecting key opportunity sites in South Richmond with major transit hubs at Richmond and El Cerrito BART stations and the SF Bay Ferry terminal.

The SRTCP also proposed implementing complete streets designs for major corridors in South Richmond including Harbour Way South, Marina Way South, Hoffman Boulevard, Carlson Boulevard, Central Avenue, and Bayview Avenue. Some corridors have been identified as priority routes for transit and freight. Other corridors were selected to include recommendations to improve the safety, comfort, convenience, and connectivity for walking, biking, or rolling.

Multimodal safety was one of six criteria to determine project and corridor prioritization. The SRTCP also informed the development of the more recent Ferry to Bridge to Greenway Complete Streets Plan (see below), with multimodal investments on Harbour Way designed and funded.

### **Yellow Brick Road Iron Triangle Walkable Neighborhood Plan**

The Yellow Brick Road Walkable Neighborhoods Project (2015) identified barriers, issues, and opportunities in the community to design and implement complete streets improvements along a number roadways in the Yellow Brick Road (YBR) network. The YBR concept was conceived by local youth living in the Iron Triangle neighborhood to safely link key areas in the neighborhood through bright yellow brick patterns on the sidewalks and roadways. The routes would connect the important assets in the community, including local elementary schools, parks, and transit.

The YBR project included a collision analysis and proposed design solutions to improve safety and walkability in the Iron Triangle. Root Routes (Phase 1) forming the backbone of the network included Pennsylvania Avenue, 7<sup>th</sup> Street, and Elm Avenue. Construction of the Root Routes is expected to be completed in 2022. Trunk Routes (Phase 2) including the Richmond Greenway, 16<sup>th</sup> Street, and 8<sup>th</sup> Street, would create cross-neighborhood north-south and east-west connectors, greatly expanding the spine of the neighborhood network. Branch Routes (Phase 3) call for the creation of additional connectivity and routing options for residents, giving them more practical transportation options to BART, schools, community centers, and parks. Funding for Phases 2 and 3 implementation has not been identified.

### **Richmond Wellness Trail Study**

The 2016 Richmond Wellness Trail Vision Plan provided a comprehensive plan for a north-south corridor connecting existing transit facilities and key destinations. Using the Pedestrian Plan and Bicycle Master Plan as a foundation, the plan proposed a series of bicycle enhancements and pedestrian amenities connecting the city's existing infrastructure to a number of destinations. Important destinations along the corridor include the Bay Trail, Ferry Terminal, Greenway, Marina Bay, Richmond BART Station, and Richmond Kaiser Permanente Medical Center. The project recommended a main spine along Marina Way from the shoreline to Central Richmond.

By proposing design elements along the corridor such as public art, fitness stations, and graphic wayfinding coupled with infrastructure improvements, the plan aimed to develop a tailored "wellness theme." With a focus on health, wellness, and safety, the Plan included separated bike facilities, pedestrian accessibility improvements, and traffic calming. The Wellness Trail proposed improvements on Marina Way, 16<sup>th</sup> Street, and 9<sup>th</sup> Street. Phase 1 of the Wellness Trail, between BART and MLK Park, completed construction in 2022.

### **First Mile/Last Mile Transportation Strategic Plan**

The 2017 Richmond First Mile/Last Mile Transportation Strategic Plan focused on providing first mile/last mile connections to the city's varied transit services and enhance its transportation network. The plan identified bicycle, pedestrian, and transit barriers leading up to the Richmond Ferry Terminal and the Richmond BART Station. The study recommended ten priority projects that to facilitate easy, safe, and efficient access to Richmond's transit hubs. Priority projects with a safety focus include Macdonald Avenue and Nevin Avenue Yellow Brick Road Improvements, Ferry to Bridge Complete Streets, Barrett Avenue and Marina Way Intersection Improvements, and Marina Way Pedestrian

Improvements. In addition to corridor improvements, programmatic recommendations put forth by the plan included bike share and e-scooter permit programs and support programs for commuters, seniors, and paratransit users. The first phase of the City's bike share started implementation in 2021.

### **Ferry to Bridge to Greenway Complete Streets Plan**

The Richmond Ferry to Bridge to Greenway Complete Streets Plan (F2B2G Plan, 2020) envisioned valuable connections for walking and bicycling to and between the Richmond Ferry, the Richmond-San Rafael Bridge Trail, and the Richmond Greenway. The F2B2G Plan, when implemented, will provide a balance of permanent regional connections and local safety improvements for people of all ages and abilities, including those in disadvantaged and traditionally underserved areas of the City. It will directly serve four City neighborhoods: Marina Bay, Santa Fe, Iron Triangle, and Point Richmond, as well as visitors from surrounding places.

The plan builds on previous Complete Streets concepts, including the Complete Streets concept for Harbour Way and the Richmond Wellness Trail and existing trails and greenways in Richmond. The F2B2G Plan included a review of the existing infrastructure in the plan area, a development of a planning framework, and presented a summary of issues and opportunities for the area. The proposed network concept features two-way separated cycle tracks on Harbour Way, Hoffman Boulevard, Cutting Boulevard, and Tewksbury Avenue, along with bike boulevards and bike lanes to safely connect neighborhoods with the Richmond Greenway and the Richmond-San Rafael Bridge. A quick build project in 2019 completed a portion of the bicycle facilities along Ohio Avenue, Garrard Boulevard, and Tewksbury Avenue. Construction on the Harbour Way South, Hoffman, and Cutting cycle tracks estimates completion in 2022.

### **Harbour Way Complete Streets**

The City developed a concept for a two-way separated cycle track and pedestrian improvements in 2018 as part of a California Active Transportation Program grant application. The concept has been expanded and updated as part of the Ferry to Bridge to Greenway Complete Streets Plan. A quick-build design for the Complete Streets improvements on Harbour Way from the ferry terminal to Hoffman Boulevard is funded. The City was expected to begin construction on the project in 2021 and coordinate with the complete streets project on Hoffman and Cutting Boulevards.

### **BART Walk and Bicycle Network Gap Study**

The BART Walk and Bicycle Network Gap Study (2020) evaluated potential improvements to the pedestrian network within a ½ mile of 17 focus BART stations. The study summarized outcomes and near- to mid-term recommendations from a series of stakeholder walk audits that took place over three years.

For the Richmond BART station, recommendations included improvements on Nevin Avenue to the west of the station, safety upgrades at Barrett Avenue and Marina Way, safer crossings and bike lane gap closures on Barrett Avenue, and pedestrian improvements along 19<sup>th</sup> Street between Macdonald and Barrett Avenues. The Study also recommended considering a road diet on Macdonald Avenue and a scramble phase at Macdonald and 16<sup>th</sup> Streets.

## Countywide Plans

The following plans from the Contra Costa Transportation Authority (CCTA) integrate or expand on City of Richmond planning efforts.

### **Contra Costa Countywide Bicycle and Pedestrian Plan**

CCTA adopted its first Contra Costa Countywide Bicycle and Pedestrian Plan (CBPP) in 2003 and updated it again in 2009. The CBPP builds on and expands the goals, policies, and strategies of the Countywide Transportation Plan (CTP). Both plans set goals for increasing and encouraging more walking and bicycling from people of all ages and abilities – equitably across the County - and identify actions CCTA and its partners should take to achieve them.

The CBPP included a collision density analysis for both bicycles and pedestrians and a level of traffic stress analysis, resulting in a proposed low-stress countywide bikeway network. For the City of Richmond, bikeways for inclusion in the countywide network included San Pablo Avenue, Rumrill Boulevard, Barrett Avenue, and Cutting Boulevard.

The CBPP also designated Priority Pedestrian Areas (PPAs) for focused investment, including all of Central and South Richmond and Richmond Annex. The PPAs identify locations with higher residential and employment densities, high growth forecasts, proximity to major transit stops, proximity to schools, and collision history.

The Plan also included educational and encouragement program recommendations. These include Safe Routes to Schools, adult education programs, transportation demand management (TDM) programs, bicycle parking, end-of-trip facilities (water, showers, lockers, etc.), bike share, wayfinding, and evaluation.

### **Richmond Area Community-Based Transportation Plan**

Led by CCTA and completed in 2020, the Community-Based Transportation Plan (CBTP) for the Richmond Area recommended a series of projects and programs to improve parts of Richmond and several neighboring areas. These recommendations were prioritized using evaluation criteria developed with plan advisors. The CBTP focused on addressing the needs of economically disadvantaged communities in Contra Costa County (based on MTC's Communities of Concern metric) through robust community engagement and demographic analysis to identify issues, priorities, and potential solutions for mobility.

Based on feedback from a Project Working Group, the Richmond Area CBTP selected four criteria for project prioritization: community priorities, increased access, financial feasibility, and ease of implementation. The CBTP outlines a set of high need and high potential projects and programs based on these criteria. These included: closing gaps in the bicycle network, improving active access to schools, pedestrian crossing improvements, closing sidewalk gaps, and others. The Plan also prioritized transit-specific and safe routes to schools projects and programs. While a collision analysis was not central to the CBTP, results of the robust community outreach process mainly centered on improving the safety and accessibility of the transportation network. Priorities in Richmond included a focus on ADA accessibility in North Richmond, sidewalk gaps and arterial safety along San Pablo Avenue, and arterial corridor safety on MacDonald Avenue.

Appendix

B

# Bicycle Design Guidelines



To: Patrick Phelan, Lydia Elias, Denee Evans, and Lina Velasco  
From: Mauricio Hernández; Ben Frazier, Alta  
Date: September 29, 2022  
Re: City of Richmond - Bicycle Design Guidelines

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## Overview

This memo presents facility design guidance to support the completion of the Travel Safe Richmond Bicycle and Pedestrian Action Plan. Taken together, the treatments offered herein give a range of options stemming from current best practices and established guidance at the state and national levels. The memo intends to serve as a flexible menu of options for developing and refining project recommendations.

The following standards and guidelines are referred to in this memo:

## California and Local Guidance



The California Manual on Uniform Traffic Control Devices (CAMUTCD) (2014) is an amended version of the FHWA MUTCD 2009 edition modified for use in California. While standards presented in the CA MUTCD substantially conform to the FHWA MUTCD, the state of California follows local practices, laws, and requirements with regards to the signing, striping, and other traffic control devices. Revision 6 (March 2021) is the most recent update at publication.

HIGHWAY DESIGN MANUAL  
May 7, 2012

**FOREWORD**

**Purpose**  
This manual was prepared for the California Department of Transportation (Department) by the Division of Design for use on the California State highway system. This manual establishes uniform policies and procedures to carry out the State highway design functions of the Department. It is written intended so, use does it establish a legal standard for these functions.

The standards, procedures, and requirements established and discussed herein are for the information and guidance of the officers and employees of the Department.

Many of the instructions given herein are subject to amendment as conditions and experience warrant. Special situations may call for deviation from policies and procedures, subject to Division of Design approval, or such other approval as may be specifically provided for in the text of this manual.

It is not intended that any standard of conduct or duty toward the public shall be created or imposed by the publication of this manual. Statements as to the duties and responsibilities of any given classification of officers or employees mentioned herein refer solely to duties or responsibilities owed by those in such classification to their superiors. However, in their official contacts, each employee should recognize the necessity for good relations with the public.

**Scope**  
This manual is not a textbook or a substitute for engineering knowledge, experience, or judgment. It includes techniques as well as graphics and tables not ordinarily found in textbooks. These are intended to aid in the quick solution of field and office problems. Except for new developments, no attempt is made to detail basic engineering techniques; for these, standard textbooks should be used.

**Form**  
The loose-leaf form was chosen because it facilitates change and expansion. New instructions or updates will be issued as sheets in the format of this manual and made available on-line on the Department Design website: <http://www.dot.ca.gov/hq/oppd/hdm/hdmmainc.htm>. The new instructions or updates may consist of additional sheets or new sheets to be substituted for those superseded. Users of this manual are encouraged to utilize the most recent version available on-line on the Department Design website.

**Organization of the Manual**  
A decimal numbering system is used which permits identification by chapter, topic, and index, each of which is a subdivision of the preceding classification. For example:  
Chapter 80 Federal-Aid  
Topic 42 Federal-Aid System  
Index 42.2 Interchange

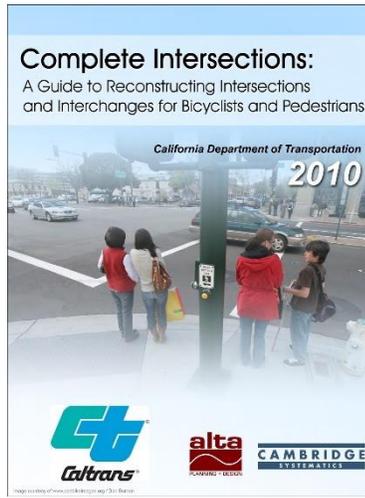
The upper corner of each page shows the page number and the date of issue.

**Use of the Table of Contents**  
The Table of Contents gives the index number and page number for each topical paragraph together with corresponding date of issue. If the holder of the manual chooses to maintain a paper copy, the holder is responsible for keeping the paper copy up to date and current. Revised Table of Contents will be found on the Department Design website as the need arises.

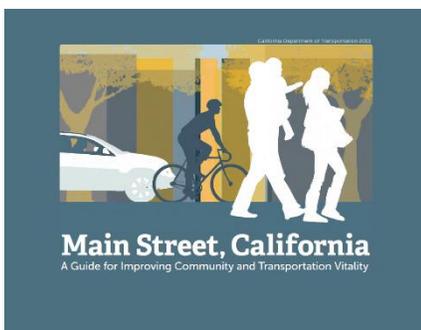
**Use of the English and Metric Editions of the Highway Design Manual**  
This Sixth Edition of the Highway Design Manual is in U.S. Customary (English) units. Departmental policy established by Director's Policy 1548 and Chapter Directive Number 1281, both effective October 2006, state that the Department has adopted the use of the U.S. Customary (English) units as the preferred system of units and measures. All projects designed and constructed in English units shall follow the standards in this manual.

The Metric standards contained in the Fifth Edition of the Highway Design Manual and related publications, are to continue to be used if the specific project was granted an exception to

The California Highway Design Manual (HDM) (Seventh Edition, 2019) establishes uniform policies and procedures to carry out highway design functions for the California Department of Transportation.



Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians (2010) is a reference guide that presents information and concepts related to improving conditions for bicyclists and pedestrians at major intersections and interchanges. The Guide can inform minor signage and striping changes to intersections and major modifications and designs for new intersections.



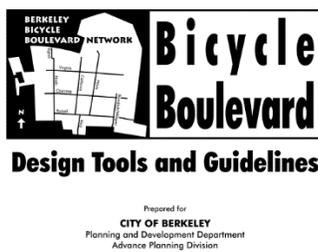
Main Street, California: A Guide for Improving Community and Transportation Vitality (2013) reflects California's current manuals and policies that improve multi-modal access, livability, and sustainability within the transportation system. The Guide recognizes the overlapping and sometimes competing needs of main streets.



West Contra Costa Transit Enhancement Strategic Plan and West Contra Costa/Albany Transit Wayfinding Plan identifies specific strategies that improve access to transit centers and routes. The Plan also provides concept level design plans that show the suggested location of pedestrian and bicycle signs along designated routes to eight study areas around existing or planned transit centers in Contra Costa County.



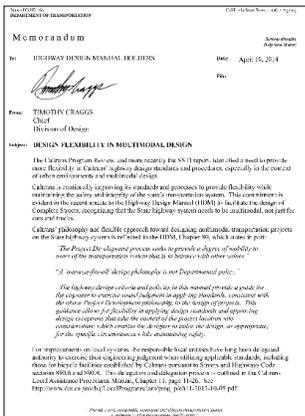
City of Oakland Design Guidelines for Bicycle Wayfinding Signage provides guidance on the development of signage and way finding for designated bikeways.



City of Berkeley Bicycle Boulevard Design Tools and Guidelines provide a set of basic tools for the implementation of bicycle boulevards



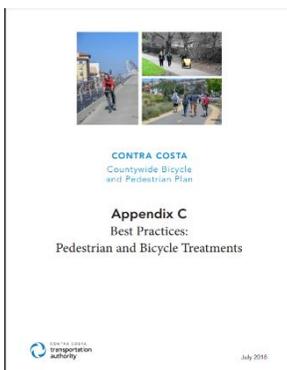
The Caltrans Memo: Design Flexibility in Multimodal Design (2014) encourages flexibility in highway design. The memo stated that "Publications such as the NACTO "Urban Street Design Guide" and "Urban Bikeway Design Guide,"... are resources that Caltrans and local entities can reference when making planning and design decisions on the State highway system and local streets and roads."



Design Information Bulletin 89-01 (DIB-89) Class IV Bikeway Guidance from Caltrans provides design guidance and information on Class IV Separated Bikeways and Cycle Tracks.

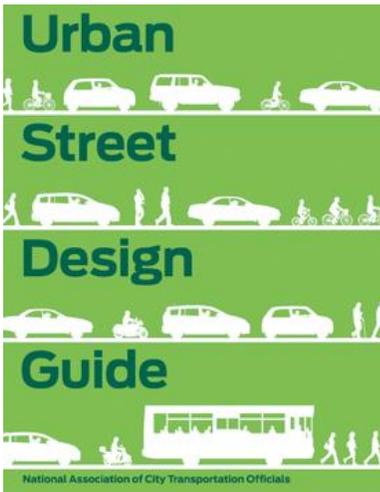


AC Transit's Multimodal Corridor Guidelines (2018) provides design guidance for five different street typologies that include considerations for people walking, biking, waiting for the bus, and bus movements that maximize safety while minimizing conflicts and impacts to bus service.

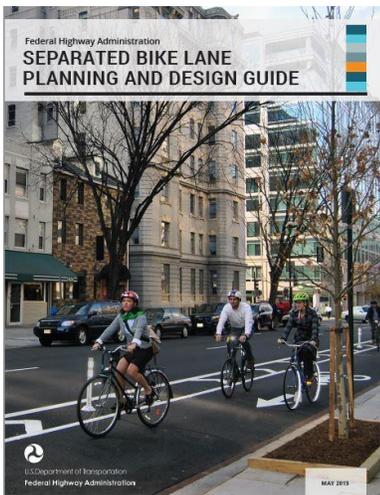


Contra Costa Transportation Authority - Best Practices for Pedestrian and Bicycle Treatments describes best practices in active transportation treatments that can be used in the implementation of the Countywide Bicycle and Pedestrian Plan.

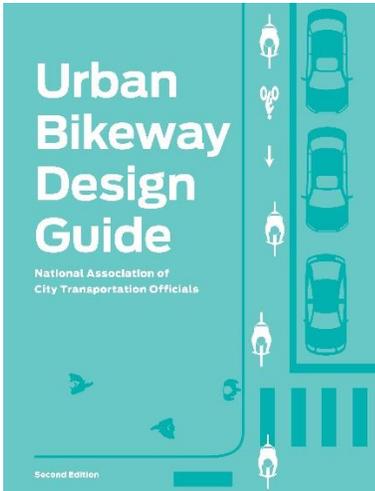
## National Guidance



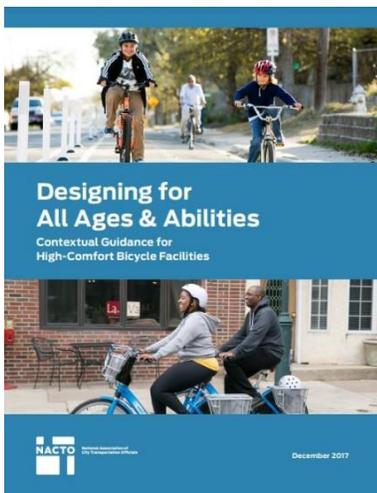
The National Association of City Transportation Officials (NACTO) Urban Street Design Guide (2013) unveils the toolbox and tactics cities can use to make streets safer, more livable, and more economically vibrant. The Guide outlines a clear vision for complete streets and a basic road map for bringing them to fruition. The document charts the principles and practices of the nation’s foremost engineers, planners, and designers working in cities.



Separated Bike Lane Planning and Design Guide (2015) provides national guidance on the planning and design of separated bike lane facilities. Released by the Federal Highway Administration (FHWA), this Guide documents best practices as demonstrated around the U.S. and offers ideas on future areas of research, evaluation, and design flexibility.



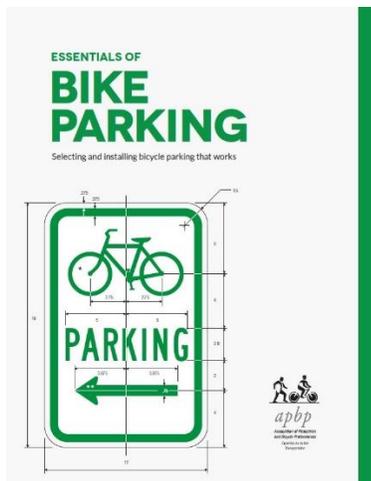
The NACTO Urban Bikeway Design Guide (2012) provides cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists. Cities developed the designs for cities since unique urban streets require innovative solutions. In August 2013, the Federal Highway Administration issued a memorandum officially supporting the use of the document.



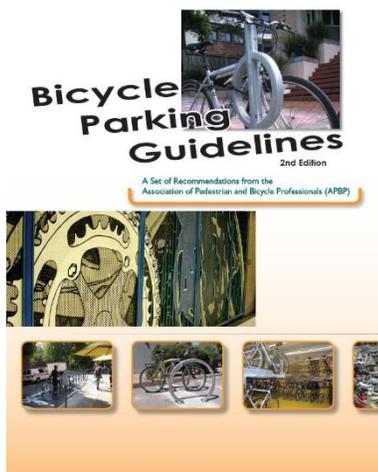
The NACTO Designing for All Ages & Abilities (2017) guide provides cities with detailed contextual guidance to designing and implementing bicycle facilities for people biking of all ages and abilities. The Guide provides information, strategies, and options on determining what type of bicycle facility will create the safest and most comfortable facility in varying contexts.



NACTO's Don't Give Up at the Intersection (2019) guide stresses the importance of intersections within bicycle networks, noting the safety and connectivity obstacles they can present to people bicycling. The Guide provides guidance on multiple intersection treatments to improve safety and visibility.



The Association of Pedestrian and Bicycle Professionals (APBP) Essentials of Bike Parking (2015) guide provides site planning, installation, rack information, and placement guidance for bicycle parking facilities.



The Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines, 2<sup>nd</sup> Edition, (2010) provides detailed information, design guidance, and installation considerations for bicycle parking racks and related infrastructure. The Guide goes into more specific details than the Essentials of Bike Parking guide.

## Design Needs of People Bicycling

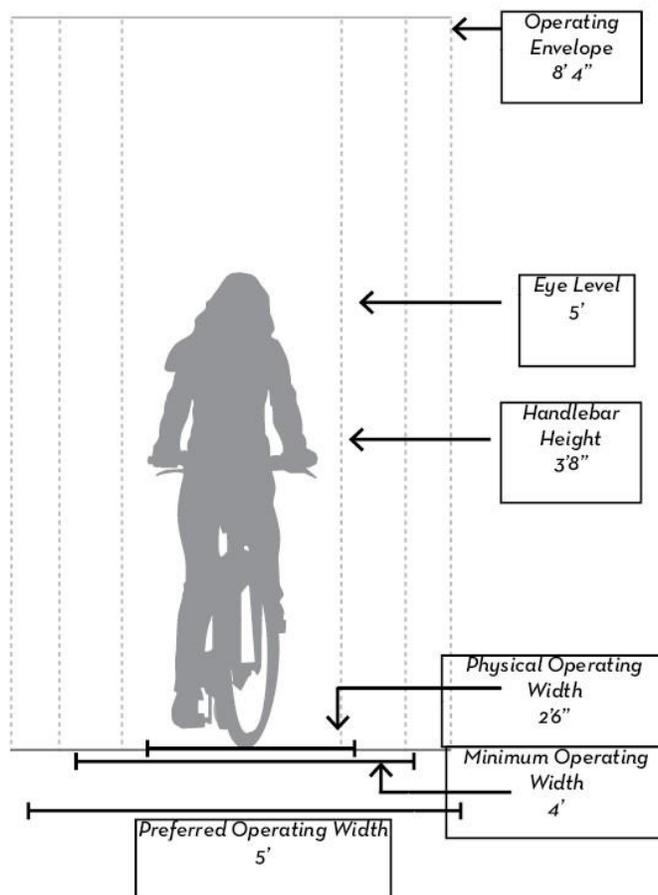
The facility designer must understand how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction, and maintenance practices than motor vehicle drivers. By understanding bicyclists' unique characteristics and needs, a facility designer can provide quality facilities and minimize user risk.

### Design Needs for People Bicycling

Like people driving and their cars, people bicycling and their bicycles exist in various sizes and configurations. These variations occur in the types of vehicles (such as a conventional bicycle, electric bicycle, a recumbent bicycle, or a tricycle) and behavioral characteristics (such as the comfort level of the bicyclist). The bikeway design should consider expected bicycle types on the facility and utilize the appropriate dimensions.

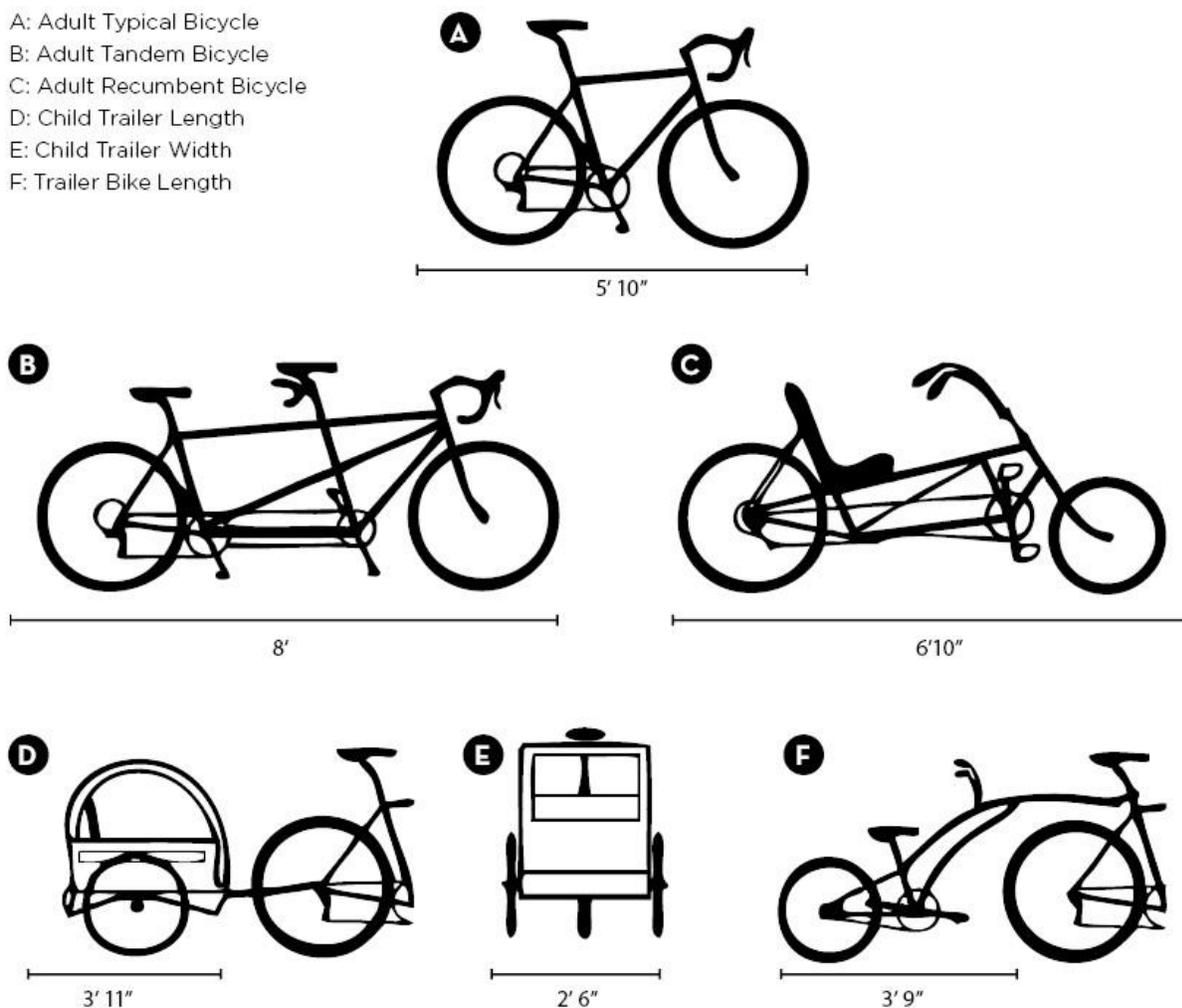
The figure to the right illustrates a typical adult bicyclist's operating space and physical dimensions, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility, and this is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure below summarizes the typical dimensions for bicycle types.



**Bicycle Design Vehicle - Typical Dimensions**

- A: Adult Typical Bicycle
- B: Adult Tandem Bicycle
- C: Adult Recumbent Bicycle
- D: Child Trailer Length
- E: Child Trailer Width
- F: Trailer Bike Length



Source: AASHTO Guide for the Development of Bicycle Facilities, 4th Edition

**Design Needs of Other Rolling Users**

In recent years power micromobility (including scooters, skateboards, bikeshare and scooter share) have become popular mobility devices. These powered micromobility typically include low-speed, motorized devices, most commonly electric (e.g., e-scooters), that typically have a speed of 20 mph or less. Powered micromobility can be operated by a wide range of users, including those who may not be able to operate a traditional bicycle. The cost of these devices continues to decrease, making them more accessible and powered micromobility for public use continues to expand with scooter-share systems being implemented in many cities across the country. The speeds of these devices are similar to bicycles and they have roughly the same design and operating envelopes of bicycles (in some cases even narrower). The below figure/table provides a summary of user needs and provide guidance on potential spacing needs.

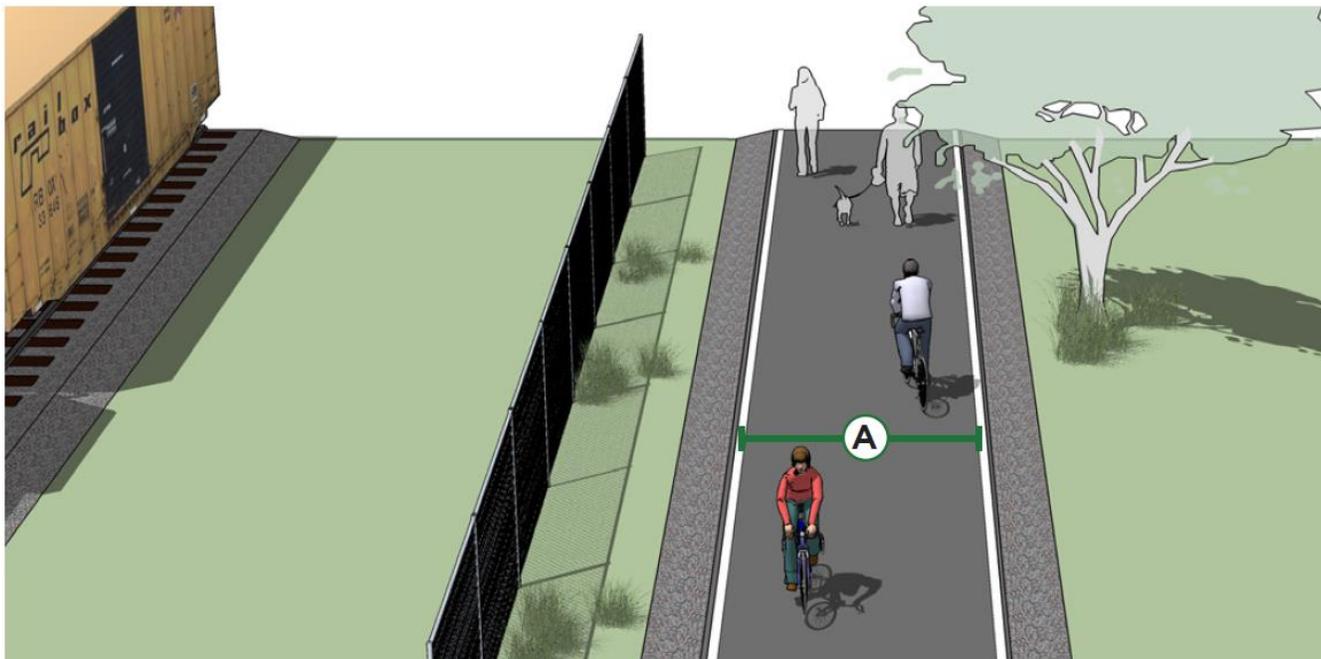
User Type	Average Speed of Travel	Dimensional Needs	
	1 to 3 mph	<ul style="list-style-type: none"> <li>Physical Width</li> <li>Preferred Operating Space</li> </ul>	1'-10" 5'-0"
	5 to 9 mph	<ul style="list-style-type: none"> <li>Eye Level</li> <li>Min. Eye Level</li> </ul>	4'-6" - 5'10" 2'-6"
	1 to 3 mph (non-motorized)  3-5 mph (motorized)	<ul style="list-style-type: none"> <li>Physical Width</li> <li>Minimum Operating Space</li> <li>Space Needed for 180° Turn</li> <li>Eye Level</li> <li>Arm Rest</li> </ul>	2'-6" 3'-0" 4'-0" 3'-8" 2'-5"
	6 to 12 mph		
	12 to 25 mph	<ul style="list-style-type: none"> <li>Physical Width</li> <li>Minimum Operating Space</li> <li>Preferred Operating Space</li> <li>Handle Bar</li> <li>Eye Level</li> </ul>	2'-6" 3'-6" 5'-0" 3'-8" 5'-0" - 5'-10"
	16 to 28 mph		* Class 1, 2 and 3 (use, access and equipment restrictions apply to Class 3); electric tricycles; electric cargo bikes; and pedal-less e-bikes. Class 1 and 2 e-bikes are throttle-limited to 20 mph.
	Up to 20 mph	<ul style="list-style-type: none"> <li>Physical Width</li> <li>Minimum Operating Space</li> <li>Preferred Operating Space</li> <li>Handlebar</li> <li>Eye Level</li> </ul>	2'-6" 3'-6" 5'-0" 3'-8" 4'-6" - 5'-10"

## Facility Types and Wayfinding

Richmond will consider the following facility types and related guidance in developing bicycle projects. A variety of factors, including but not limited to safety, user experience, existing conditions, available right-of-way, and stakeholder input, will inform what the appropriate recommendation is for any given location.

### Shared Use Path (Class I)

Shared use paths (Class I) are off-street facilities that can provide a desirable transportation and recreation connection for users of all skill levels who prefer separation from traffic. They often provide low-stress connections to local and regional attractions that may be difficult or not be possible on the street network. Shared Use Paths can be used throughout the city, in various contexts, from the Bay Trail to the Richmond Greenway.



#### Typical Application

Class 1 paths can be developed in various linear corridors, open spaces, or adjacent to roadways where sufficient separation exists.

#### Design Features

- A. Eight feet is the absolute minimum width allowed for two-way travel (with 2-foot shoulders) and is only recommended for constrained situations (Caltrans HDM).
- 10-feet is recommended (but not required) for trail situations with moderate use.
  - 12-feet is recommended (but not required) for heavy use situations OR situations with high concentrations of multiple user types (people walking, bicycling, rolling, etc.).

- Wider facilities can more comfortably accommodate side-by-side riding and encourage more social use of trails while reducing conflicts.
- If there is a desire to separate people walking and bicycling, wider facilities should be provided. A separate track (5-foot minimum) can be provided for pedestrian use but is not required.

## Further Considerations

### Lateral Clearance

- HDM requires that a minimum 2-foot-wide shoulder, composed of the same pavement material as the bike path or all-weather surface material (ex. Decomposed granite) free of vegetation, be provided adjacent to the travelled way of the path when not on a structure. The CA MUTCD requires an additional foot of lateral clearance (total of 3 feet) to install signage or other furnishings.
- If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night. Other design alternatives (like curb diverters) are preferred over bollards.

### Overhead Clearance

- Clearance to overhead obstructions must be an 8-foot minimum, with 10 feet recommended, according to Caltrans HDM.

### Striping

- When striping is desired, it's recommended that a 4-inch dashed yellow centerline stripe be used.
- Solid centerlines can be provided (but are not required) on tight or blind corners and the approaches to roadway crossings.
- 4-inch solid white edge lines are optional but will narrow the effective width of the facility.

### Materials and Maintenance

- Shared use paths must be regularly maintained to be free of potholes, cracks, root damage, and debris. Signage and lighting should also be regularly maintained to ensure shared use path users feel comfortable, especially where visibility is limited.
- Adjacent landscaping should be regularly pruned to allow adequate sightlines, daylight, and pedestrian-scale lighting and not obstruct trail users' travel paths.



*San Francisco Bay Trail in the Richmond Marina.*

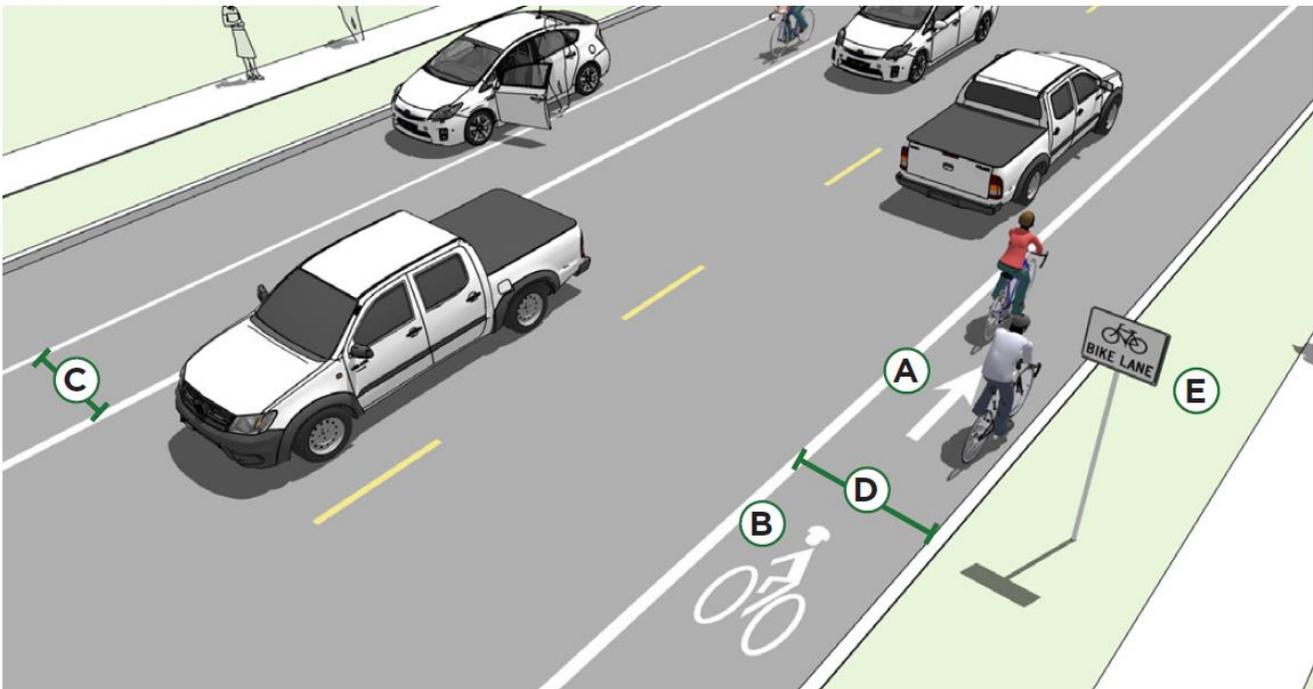
*Source: City of Richmond*

## On-Street Bicycle Lanes (Class II)

On-street bicycle lanes (Class II) are a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitate predictable behavior and movements between bicyclists and motorists.

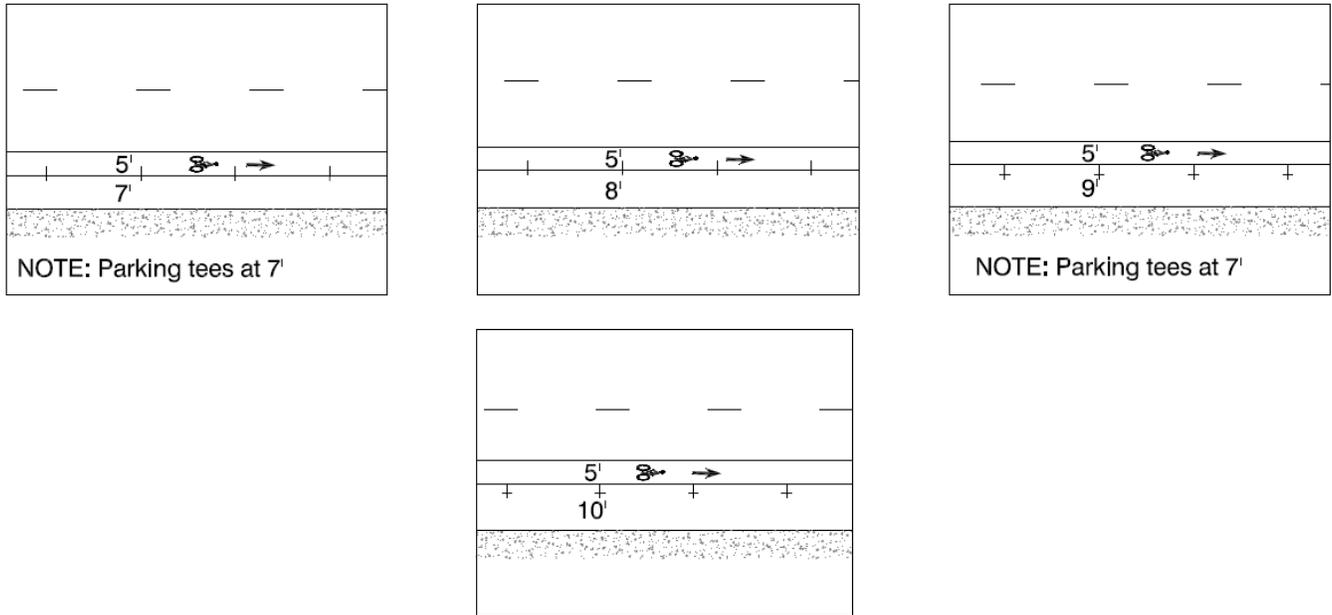
### Typical Application

- Bike lanes may be used on any street with adequate space but are most effective on streets with moderate traffic volumes (greater than 6,000)
- Bike lanes are most appropriate on streets with low to moderate speeds of 25 mph to 35 mph.
- Appropriate for skilled adult riders on most streets.
- They may be considered low-stress when on a street with one lane in each direction, a speed limit of 25 mph or less, and traffic volumes fewer than 3,000 vehicles a day.



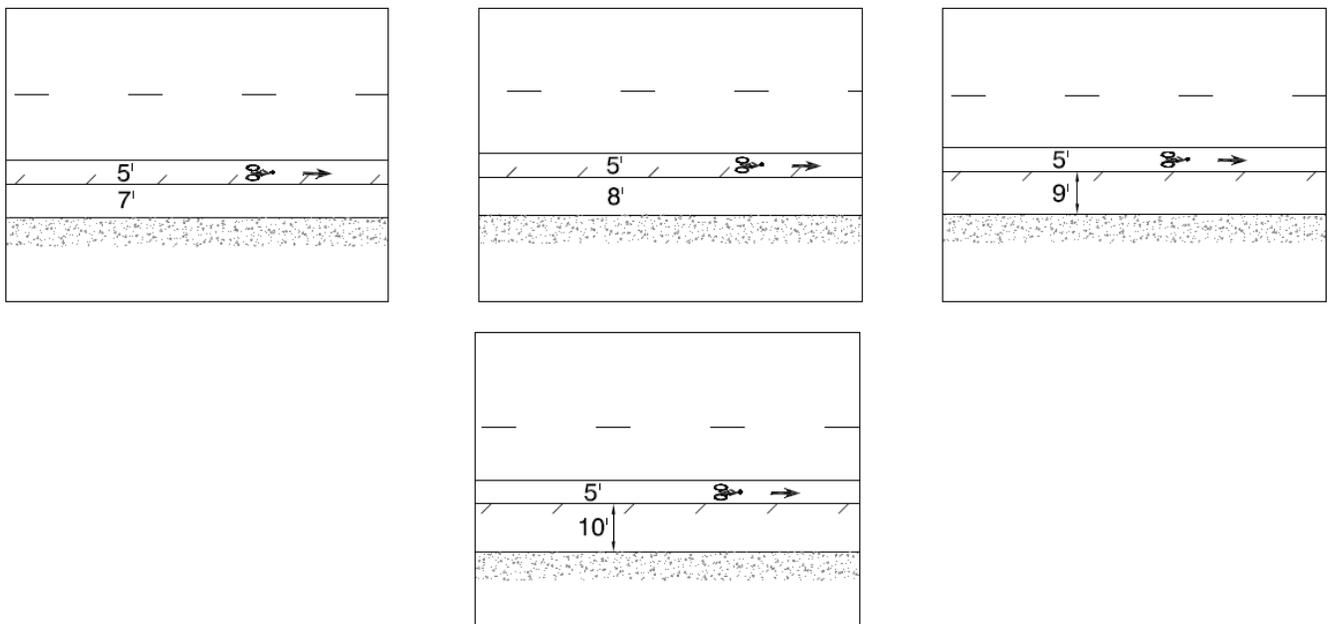
### Design Features

- A. Mark inside line with 6-inch stripe.
  - When next to vehicle parking, mark a 4 to 6-inch parking lane line or "Ts" (MUCTD 9C-101).
  - In areas with metered parking, parking "Ts" should be marked at the following distances from the curb based on parking lane size:



*From City of Oakland Bike Lanes for various widths*

- o In areas with non-metered parking, mark 6-inch white parking side buffer at 45 degrees, every 15-feet, 2-feet in width measured perpendicular to curb line.



*From City of Oakland Bike Lanes for various widths*

- B. Bicycle lane markings must be included at the beginning of blocks (MUTCD 9C-3) and at regular intervals along the route based on engineering judgment (MUTCD 9C.04).

The city of Richmond places bicycle lane markings 20 feet past the curb return to help preserve the marking from deterioration from turning vehicles

- C. 6-foot width is preferred adjacent to on-street parking, but 5-foot is the minimum requirement.
- D. 6-foot is preferred adjacent to curb and gutter (5-foot is the minimum requirement) or 3-foot minimum/ 4-foot preferred wider than the gutter pan width.

The signage consists of an optional R81 (CA) sign, which must be placed at the beginning of each bike lane and at major changes in direction. It should also be placed at every arterial street and at 1/2-mile intervals. Please note that the City of Richmond uses wayfinding in lieu of the R81 (CA) sign.

### Further Considerations

- On high-speed streets (greater than 35 mph), it's recommended but not required that the minimum width for a bike lane should be 6 feet.
- On streets where bicyclists passing each other is expected, where high volumes of bicyclists are present, or where added comfort is desired, consider providing extra wide bike lanes up to 7-foot wide or configure them as buffered bicycle lanes.
  - To minimize driver confusion on the lane's purpose, extra attention should be given to signs and pavement markings of wide bicycle lanes.
- It may be desirable (but not required) to reduce the width of vehicle travel lanes to add or widen bicycle lanes or calm traffic next to the bike lane.
- Green color may be used (but is not required) within the lane to discourage motorists from entering the lane. Treatment has interim approval from Caltrans (IA-14). Green paint may also be used in more limited instances, like at the entry and exit points of bike lanes on each block. Hatched green bike lane markings are recommended at conflict points like intersections, major driveways, or beginning of turn pockets
- On multilane and/or high-speed streets, the most appropriate bicycle facility for user comfort may be buffered bicycle lanes or separated bicycle bikeways.
- Application of bike lane markings that include bike symbol (with helmet) and arrow markings (MUTCD Figure 9C-7) are preferred as noted in the figure to the right.



*Bike lane markings in Richmond on 37<sup>th</sup> Street*

### Manhole Covers and Grates

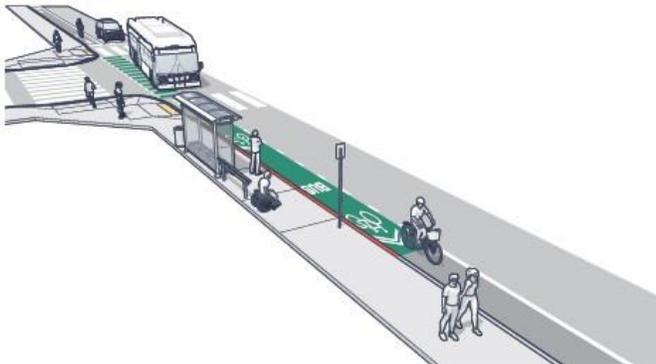
- Maintenance hole surfaces should be manufactured with a shallow surface texture in the form of a tight, nonlinear pattern.

- If maintenance holes or other utility access boxes are to be located in bike lanes within 50 feet of intersections or within 20 feet of driveways or other bicycle access points, special manufactured permanent nonstick surfaces are required to ensure a controlled travel surface for bicyclists breaking or turning.
- Maintenance holes, drainage grates, or other obstacles should be set flush with the paved roadway. Roadway surface inconsistencies pose a threat to safe riding conditions for bicyclists. Construction of maintenance holes, access panels, or other drainage elements will be constructed with no variation in the surface. The maximum allowable tolerance in vertical roadway surface will be 1/4 of an inch. Drainage grates must include elements that are perpendicular to travel direction

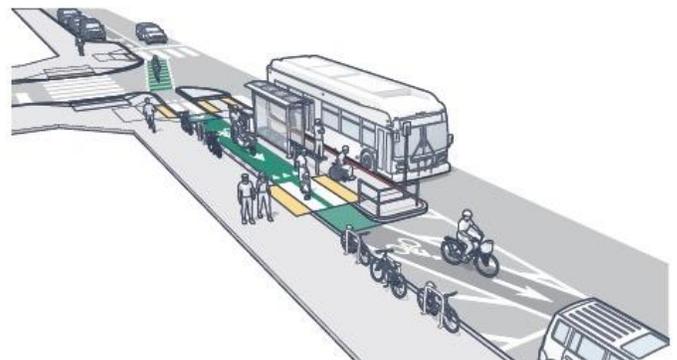
## Interactions with Transit

To minimize the interruptions to users of Class II facilities along transit corridors (i.e., bus) and limit the conflicts between users, the following typologies are included in the AC Transit Multimodal Corridor Guidelines. More details on each typology can be found within the Guide.

**Typology 1**  
Class II Bicycle Facility between the Curb and a General Traffic Lane



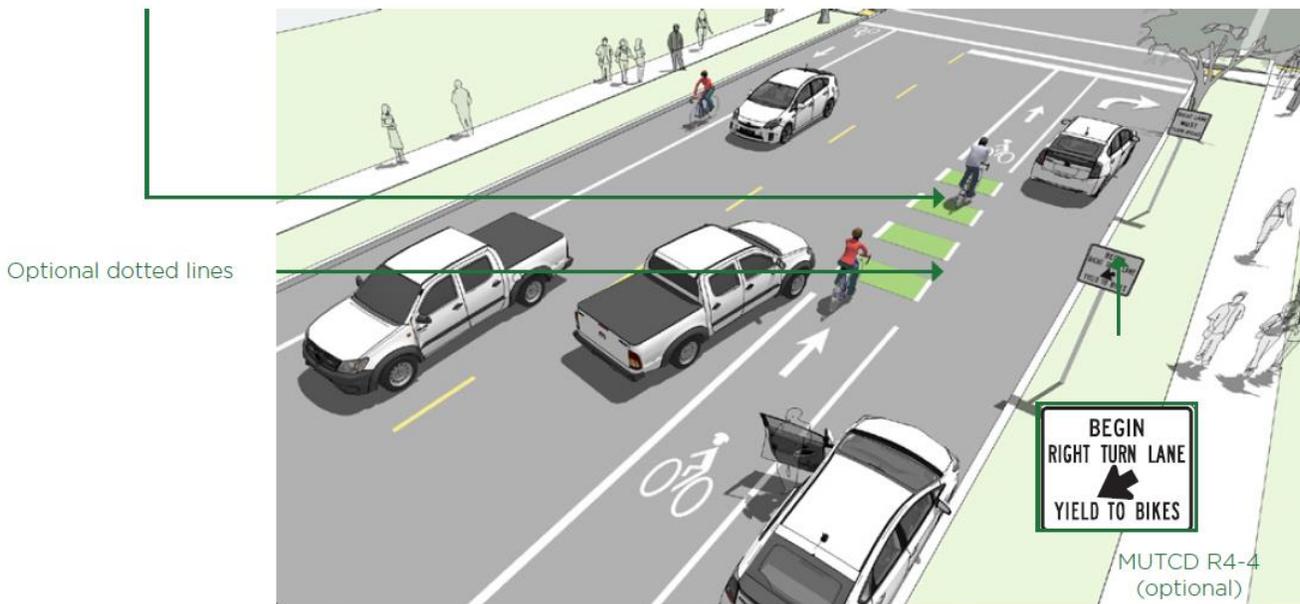
**Typology 2**  
Class II Bicycle Facility between Curbside Parking Lane and General Traffic Lane



## Bike Lanes at Right-Turn Lanes

At right-turns, it's recommended that bike lanes be placed between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to use a shared bike lane/turn lane. The design (below) illustrates conflict markings in green, with signage indicating that motorists should yield to bicyclists through the conflict area.

Colored pavement may be used in the weaving area to increase visibility and awareness of potential conflict



### Typical Application

- Locations where vehicular traffic must cross over dedicated bike facilities to enter a right-turn lane.
- At auxiliary right turn only lanes or where a through lane becomes a right turn only lane.

### Design Features

- Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- Use R4-4 signage should be used to indicate that motorists should yield to bicyclists through the conflict area.
- Consider (but not required) the use of colored conflict areas to promote the visibility of the mixing zone.
- In some instances, especially where bike lane alignment shifts, sharrows may be appropriate at conflict zones.



*Drivers wishing to enter the right turn lane must transition across the bicycle lane in advance of the turn.*

### **Further Considerations**

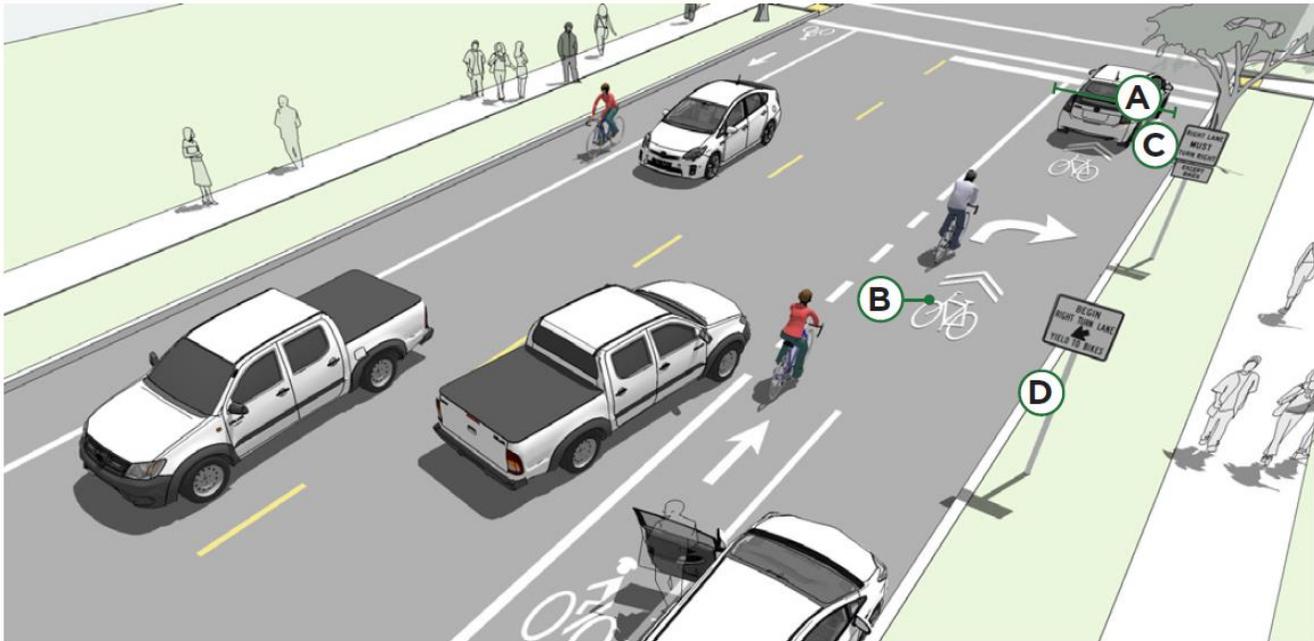
- The bicycle lane maintains a straight path, and drivers must weave across, providing clear right-of-way priority to bicyclists.
- Maintaining a straight bicycle path reinforces the priority of bicyclists over turning cars. Drivers must yield to bicyclists before crossing the bike lane to enter the turn lane.
- Through lanes that become turn-only lanes are difficult for bicyclists to navigate and should be avoided unless at signalized intersections that have appropriate phasing for bicycles.
- The use of dual right-turn-only lanes should be avoided on streets with bike lanes (AASHTO, 2013). Where there are dual right-turn-only lanes, the bike lane should be placed to the left of both right-turn lanes; however, this merge is uncomfortable for most bicyclists. Keeping the bike lane to the right of the turn lanes is possible if a bicycle signal phase is implemented to separate bicyclists from right-turning vehicles.

### **Materials and Maintenance**

- Because the effectiveness of markings depends entirely on their visibility, maintaining the visibility of markings should be a high priority. Special consideration should be given to pavement markings on concrete that can have different application methods and different durability.

## Combined Bike Lane/Turn Lane

Where there isn't room for a conventional bicycle lane and turn lane, a combined bike lane/turn lane creates a shared lane where bicyclists can ride and turning motor vehicles yield to through traveling bicyclists. The combined bicycle lane/turn lane places shared lane markings within a right turn only lane.



### Typical Application

- Most appropriate in areas with lower posted speeds (25 MPH or less) and lower traffic volumes (10,000 ADT or less).
- May not be appropriate for high-speed arterials or intersections with long right turn lanes or intersections with large percentages of right-turning vehicles.
- This treatment is recommended (but not required) at intersections lacking sufficient space to accommodate a standard through bike lane and a right turn lane.

### Design Features

- A. The maximum shared turn lane width is 13 feet; narrower is preferable (NACTO, 2012).
- B. Shared Lane Markings should indicate the preferred positioning of bicyclists within the combined lane.
- C. A "Right Lane Must Turn Right" (CA MUTCD R3-7R) sign with an "EXCEPT BIKES" plaque may be needed to permit through bicyclists to use a right turn lane.
- D. "Begin Right Turn Lane Yield to Bikes" signage (CA MUTCD R4-4) is recommended to indicate that motorists should yield to bicyclists through the conflict area.
  - There should be a receiving bicycle lane or shoulder on the far side of the intersection



*Shared lane markings and signs indicate that bicyclists should ride on the left side of this right-turn-only lane.*

### **Further Considerations**

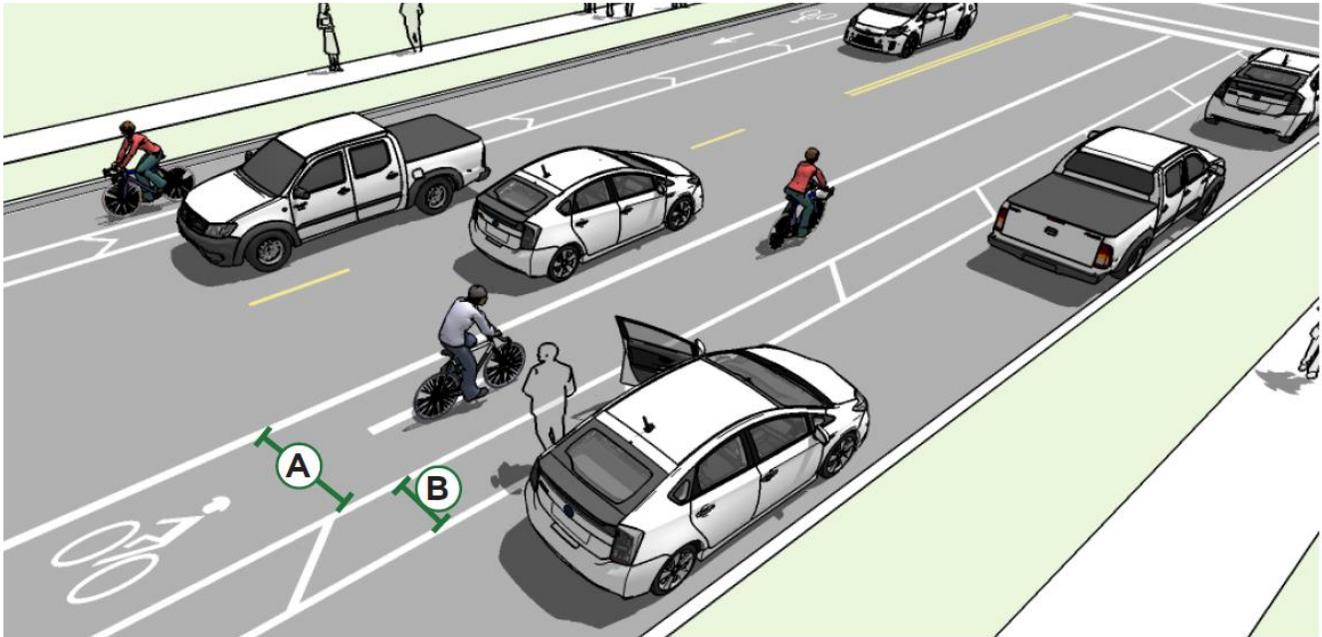
- Combined bike lane/turn lane creates safety and comfort benefits by negotiating conflicts upstream of the intersection area.

### **Materials and Maintenance**

- Because the effectiveness of markings depends entirely on their visibility, maintaining the visibility of markings should be a high priority.

## Buffered Bicycle Lanes (Class IIb)

Buffered bike lanes (Class IIb) are conventional bicycle lanes paired with a designated striped buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane.



### Typical Application

- Anywhere a conventional bike lane is being considered.
- On streets with high speeds and high volumes or high truck volumes.
- On streets with extra lanes or lane width.
- Appropriate for skilled adult riders on most streets.

### Design Features

- The desired minimum bicycle travel area (not including buffer) is 5-feet wide, while the absolute minimum width is 4-feet (CA MUCTD).
- Buffered area width must be at least 18-inches wide but should be at least two-feet wide. If the buffered area is 4-feet or wider, white chevron or diagonal markings should be used (CA MUTCD 9C-104).
  - For clarity at driveways or minor street crossings, a dotted line (skip dashing) should be considered to identify the bicycle travel path, but it is not required.
  - There is no standard for whether the buffer is provided on the parking side, the travel side, or a combination of both.
  - The use of pavement markings delineates space for bicyclists to ride and buffer area to create a more comfortable facility. Green paint at the entry and exit points near intersections can also increase driver awareness of the presence of bicycles.



*Left: A buffered bike lane on 17<sup>th</sup> Street. This section of 17<sup>th</sup> also includes speed cushions. Right: Buffered bike lane on 37<sup>th</sup> Street approaching the BART overpass.*

### **Further Considerations**

- Color may be used but is not required within the lane to discourage motorists from entering the buffered lane.
- On multilane streets with high vehicle speeds, the most appropriate bicycle facility for user comfort may be separated bikeways.
- When space is limited, NCHRP Report #766 recommends installing a buffer space between the parking lane and bicycle lane rather than between the bicycle lane and vehicle travel lane.

## Bike Route (Class III)

Bike routes are shared facilities designated for bicycle travel. Bike routes can be either in-road facilities (where bicyclists share the travel lane with vehicles) or be visually separated facilities (where bicyclists ride on paved shoulders adjacent to vehicular traffic). Signs and appropriate markings should accompany bike routes to notify all road users. According to the FHWA Bikeway Selection Guide “in shared lanes, bicyclists ride in mixed traffic, therefore their comfort and safety varies widely based on traffic operating speeds and volumes. Shared lanes can be a positive and affordable solution when designed correctly and used in the correct context; however, the vast majority of bike/car crashes in the U.S. occur in shared lanes that are applied to inappropriate contexts and environments”. As the majority of bicyclists (current or potential) do not feel comfortable on multi-lane or higher speed roadways with shared lane markings, the MUTCD suggests these markings be restricted to roadways with operating speeds of 35 miles per hour or less. Bicycle Boulevards with additional traffic calming measures are the preferred treatment.

### Typical Application

- Low volume roadways with limited roadway width and few intersections

### Design Features

#### Shared Lane

- Shared lane markings serve several purposes, including making motorists aware of the shared route and showing bicyclists the direction of travel and their preferred positioning within the lane.
- Markings should be placed to indicate bicyclist positioning in the roadway. When placed next to parking, markings should be placed outside of the door zone. In constrained areas, center the marking in the lane. Minimum placement is 11.5-feet from the curb.
- Markings should be placed immediately after intersections and spaces at 100 to 200-foot intervals thereafter.
- Shared lane markings provide a wayfinding element that should only be used as a reasonable alternative to a bike lane in limited circumstances, to fill a gap in an otherwise continuous bike lane, according to NACTO’s Urban Bikeway Design Guide.



#### Paved Shoulder Bike Route

- A paved shoulder should provide 4 to 6 feet for bicyclists. The absolute minimum allowable width is 2 feet when no obstructions are present.
- While not required, consider using contrasting paving materials between the paved shoulder and adjacent travel lanes to differentiate between the two clearly.

## Further Considerations

### Markings

- [Shared lane] A green background can be applied further to increase the visibility of the shared lane markings.
- [Shoulders] Wide solid white lines or buffer areas enhances the visual separation between shoulder and travel lane.
- [Shoulders] While not required, if rumble strips are installed in the roadway, consider installing bicycle-friendly rumble strips. Ideal spacing should include 12-inch spacing (center-to-center), 6-8 inches long (perpendicular to the roadway), 6 inches wide (measured parallel to the roadway), and 3/8-inch deep, according to FHWA Technical Advisory 5040.39.

### Signs

It's recommended that signs be used to alert road users of the designation of the shoulder or shared in-road facility as a shared bicycle facility.

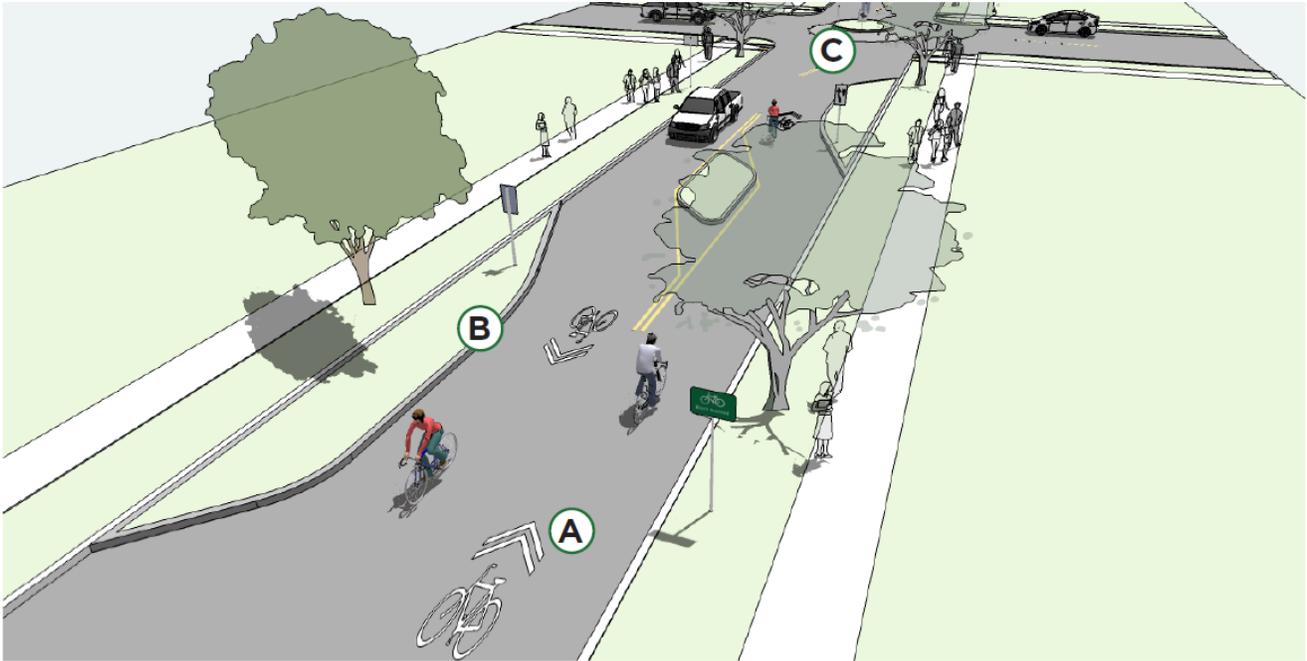
- Bike Route Guide (D11-1c) signs are used to indicate to bicyclists that they are on a designated bikeway and alert motorists of the bike route.



*Sharrow pavement markings on Key Boulevard.*

## Bicycle Boulevards (Class III)

Bicycle boulevards (Class III, commonly unofficially referred to as Class IIIb) are low-volume, low-speed streets modified to prioritize and enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming, traffic reduction/diversion, and intersection modifications. These treatments prioritize through movements of bicyclists while discouraging (and in some cases limiting) similar through-trips by non-local motorized traffic (while still allowing emergency vehicle access).



### Typical Application

- Parallel with and near major thoroughfares (1/4-mile or less) OR in residential areas to connect to community destinations and the larger bicycle network.
- Along corridors that create sufficient network density of routes suitable for all ages and abilities.
- Avoid alignments with excessive zigzag or circuitous routing. The bikeway should strive to have less than 10 percent out-of-direction travel compared to the shortest path along the primary corridor.
- Streets with travel speeds at 25 mph or less (20 mph recommended) and traffic volumes of fewer than 1,500 vehicles per day.

### Design Features

- A. Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard.

- B. Implement volume control treatments based on the context of the bicycle boulevard, using engineering judgment. Target motor vehicle volumes range from 1,000 to 1,500 vehicles per day.
- C. Intersection crossings should be designed to prioritize the movement of people bicycling while enhancing their comfort and safety. To this end, stop signs or traffic diverters may be considered on cross streets to prioritize the free flow of bicyclists of all ages and abilities.

### Further Considerations

- Bicycle boulevards are typically located on streets without existing signalized accommodation with collector and arterial roadways crossings. Without treatments for bicyclists (and pedestrians), these intersections can become major barriers along the bicycle boulevard.
  - Crossing aids such as rectangular rapid flashing beacons (RRFBs), pedestrian hybrid beacons (PHBs), and median islands are some of the treatments that can improve the crossing experiences and increase driver awareness at uncontrolled locations.
- Traffic calming can lower motorized vehicle speeds along bicycle boulevards and deter motorists from driving on that street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes or diversions. Traffic calming can be implemented on a trial basis using quick build or temporary materials.



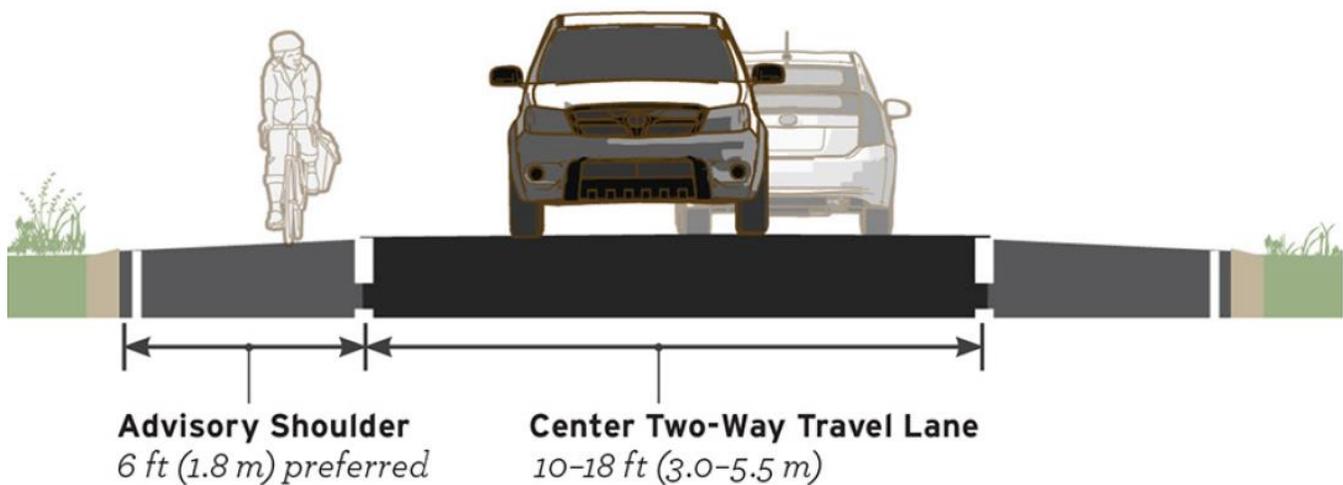
*This bicycle boulevard on 18th Street includes a custom bicycle boulevard pavement marking and speed bumps for traffic calming.*



*Bicycle boulevard traffic calming should also include intersection treatments, where appropriate. This Berkeley example includes a partial intersection diversion.*

## Advisory Bike Lanes (Advisory Shoulders)

Advisory bike lanes or shoulders create a usable shoulder for bicyclists and/or pedestrians on a roadway that is otherwise too narrow to accommodate one. Pavement markings and optional pavement color delineate the shoulder. Motorists may only enter the shoulder when no bicyclists or pedestrians are present and must overtake these users with caution due to potential oncoming traffic. The width of the advisory shoulder should take preference over widening travel lanes. Wider travel lanes frequently encourage faster speeds, endangering pedestrians and bicyclists using the shoulder, as well as other drivers. Where applicable, travel lanes should be kept to 13.5 feet, with the remaining Right of Way dedicated to the Advisory Shoulder.



### Typical Application

- Low volume, low-speed roadways with limited roadway width and few intersections

### Design Features

#### Advisory Shoulder

- Unlike a conventional shoulder, an advisory shoulder is a part of the traveled way. It is expected that vehicles will regularly encounter meeting or passing situations where driving in the advisory shoulder is necessary and safe.
- The advisory shoulder space is a visually distinct area on the edge of the roadway, offering a prioritized space for people to bicycle and walk.
- The preferred width of the advisory shoulder space is 6-feet, and the absolute minimum width is 4-feet when no curb and gutter is present.
- While not required, consider using contrasting paving materials between the advisory shoulder and center travel lane to differentiate between them and minimize unnecessary encroachment and reduce regular straddling of the advisory shoulder striping.

## Two-Way Center Travel Lane

The two-way center travel lane is created from the remaining paved roadway space after the advisory shoulder has been accounted for.

- The preferred two-way center travel lane width is 13.5 to 16 feet, although it may function with widths of 10 to 18 feet.

## Further Considerations

### Markings

- A broken lane line used to delineate the advisory shoulder should consist of 3 feet line segments and 6-foot gaps between them.
- Where additional edge definition is desired, stripe a standard solid white edge line in addition to the broken advisory shoulder line.
- If the advisory shoulder is intended for bicycle use only, bicycle lane markings and green pavement can be used (but are not required), similar to conventional bicycle lanes.
- In general, do not mark a centerline on the roadway. Short sections may be marked with centerline pavement markings to separate opposing traffic flows at specified locations, such as around curves, over hills, on approaches to controlled intersections, and at bridges. Consider widening the paved roadway surface at these locations to provide space for paved bicycle-accessible shoulders and conventional width travel lanes.

### Intersections

- Advisory shoulder designs work best on road segments without frequent stop or signal-controlled intersections that require vehicles to stop within the roadway. The designer should strive to maintain the visual definition of the advisory shoulder through all driveways and street crossings and provide a conventional shoulder at controlled intersections.
- At minor street crossings, use a dotted line extension on both sides of the advisory shoulder to maintain delineation of the advisory shoulder space.
- If contrasting pavement material is used to signify the edge of the shoulder, maintain the material through driveway crossings and minor intersections.
- Where a stop sign or traffic signal controls the road, discontinue the advisory shoulder 50-feet before the intersection. At these locations, provide a bicycle-accessible paved shoulder outside of the full-width travel lanes or design for operation as a shared roadway.

### Signs

Use signs to warn road users of the special characteristics of the street. Potential signs for use with advisory shoulders include:

- Use an unmodified two-way traffic warning sign (W6-3) to clarify the two-way operation of the road.
- Use a NO CENTER LINE warning sign (W8-12) to help clarify the unique striping pattern.
- Use a NO PARKING ON PAVEMENT (R8-1) to discourage parking within the advisory shoulder.

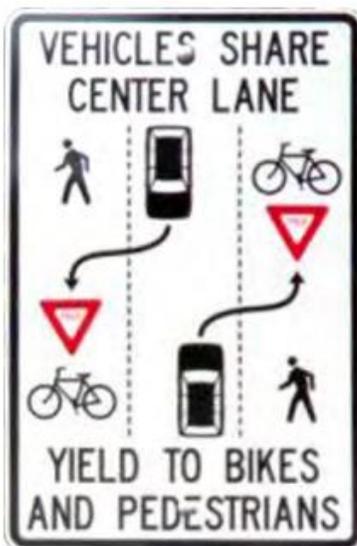
As these are not commonly installed facilities, extra attention should be given to signage, pavement markings, and roadway user education.

### Accessibility

Advisory bike lanes, as described here, are not intended for primary use by pedestrians. When advisory shoulders are designed for use by pedestrians, they should meet accessibility guidelines.

### Implementation

California MUTCD does not have a sign policy for advisory bike lanes nor is the sign covered by the California MUTCD. However, under the Caltrans Bikeway Facility Selection Guidance Memo, advisory bike lanes can be applied on the local road system. Use of this bikeway facility type requires FHWA experimental approval and typically is not appropriate for moderate to higher volumes and speeds. To install advisory bike lanes, an approved Request to Experiment is required as detailed in the MUTCD 2009, Sec. 1A.10. FHWA is also accepting requests for experimentation with a similar treatment called "dashed bicycle lanes."



*Signs can reduce potential confusion about the configuration of the roadway. Some local examples demonstrate the correct yielding procedures for drivers, pedestrians, and bicyclists.*



*The Federal Highway Administration's Small Town and Rural Guidelines recommends installing an unmodified two-way traffic warning sign (W6-3).*



*Advisory bike lanes in San Francisco within the Presidio along Graham Street. Photo: Presidio and Presidio Trust.*

## Bike Intersection Crossings

Bicycle pavement markings through intersections guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and vehicles in the adjacent lane. These are sometimes called cross-bikes or intersection conflict markings.



### Typical Application

- Streets with conventional, buffered, or separated bike lanes.
- Streets with high volumes of adjacent traffic.
- Where potential conflicts exist between through bicyclists and adjacent traffic.

### Design Features

- A. Intersection markings should be the same width and in line with the leading bike lane.
  - Dotted lane line extensions should be 2-foot line segments with 2- to 6-foot gaps between them based on engineering judgments (CAMUTCD 3B.08).
  - All markings must be white, skid-resistant, and retro-reflective (CAMUTCD 9C.02.02).
- B. Dotted white lines may be (but are not required to be) enhanced with solid green or dashed green within the same extents as the dotted line itself.



*Intersection crossing markings can be used at signalized intersections or high-volume minor street and driveway crossings. This example from the intersection of Barrett Street and Harbour Way also includes a mixing zone and a bike lane to continues all the way through the intersection.*

### **Further Considerations**

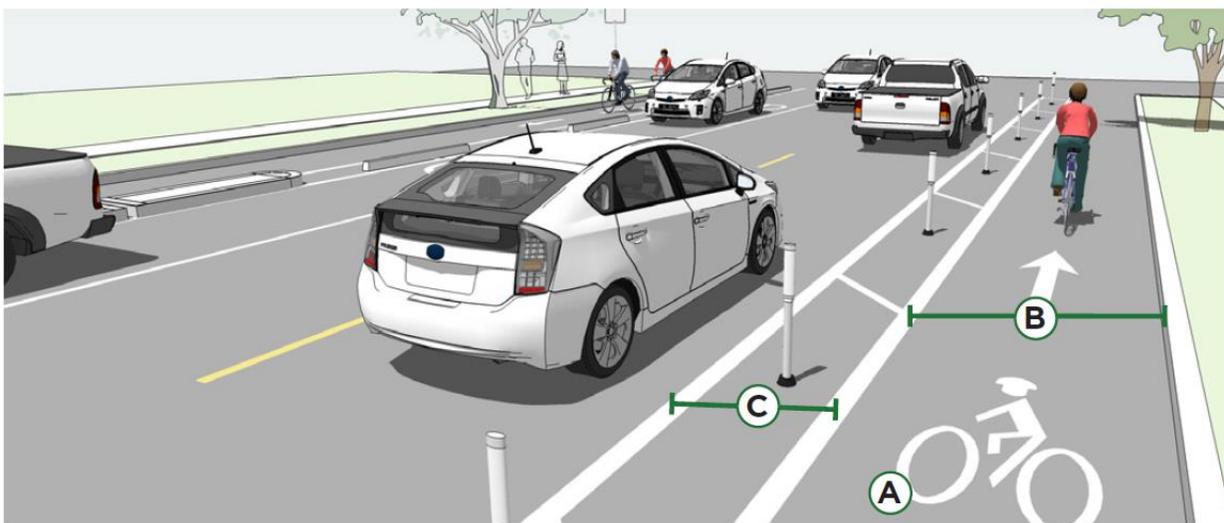
The National Committee on Uniform Traffic Control Devices has submitted a request to include additional options for bicycle lane extensions through intersections as a part of future MUTCD updates. Their proposal includes the following options for striping elements within the crossing:

- Bicycle lane markings.
- Double chevron markings, indicating the direction of travel.
- Green-colored pavement.

## Separated Bikeways (Class IV)

Separated bikeways (Class IV) have different forms, but all share common elements—they provide space that is separated from motor vehicle travel lanes, parking lanes, and sidewalks, exclusively for bicycles and other personal wheeled mobility devices. In situations where on-street parking is allowed, the separated bikeways are located on the curb-side of the parking (in contrast to bike lanes).

Class IV bikeways may be at street level, sidewalk level, or an intermediate level. When retrofitting separated bikeways onto existing streets, one-way facilities on both sides of the street may be most appropriate. This design provides protection through vertical physical barriers and can include flexible delineators, curbs, on-street parking, or other barriers (i.e., planters).



### Typical Application

- Street retrofit projects with limited funds for relocating curbs and drainage.
- Streets with high motor vehicle volumes and/or speeds and high bicycle volumes.
- Streets for which conflicts at intersections can be effectively mitigated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.
- Appropriate for most riders on most streets.

### Design Features

- A. Pavement markings, symbols, and/or arrow markings must be placed at the beginning of the protected bikeway and at intervals along the facility (MUTCD 9C.04).
- B. 5-foot minimum width is required to allow for passing, with a 7-foot width preferred (NACTO, 2012).

- C. 3-foot minimum buffer width is required when adjacent to parking. For facilities adjacent to travel lanes, an 18-inch width is the minimum required. Channelizing devices (i.e., flex posts) should be placed in the buffer area (NACTO, 2012).
- If the buffer area is 4-feet or wider, white chevron or diagonal markings are recommended.



*Protected Bikeways can be separated from the street with parking, planters, bollards, or other design elements. They can also be one-way or two-way facilities. The above photo shows a two-way bollard and armadillo separated bikeway on Ohio Avenue.*

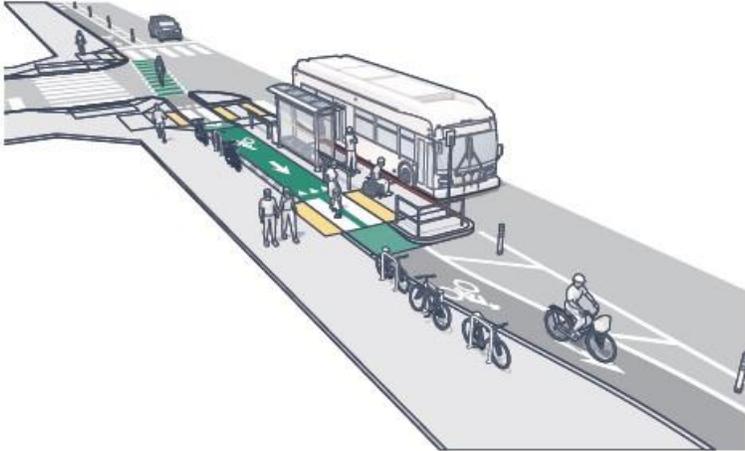
### Further Considerations

- Protected bikeway buffers and barriers are covered in the MUTCD as preferential lane markings (section 3D.01) and channelizing devices (section 3H.01). Curbs may be used as a channeling device. See the section on islands (section 3I.01).
- A retrofit protected bikeway lane has a relatively low implementation cost compared to road reconstruction by using existing pavement and drainage and using a parking lane as a barrier.
- Gutters, drainage outlets, and utility covers should be designed and configured not to impact bicycle travel.
- Special consideration should be given at transit stops to manage bicycle and pedestrian interactions and transit passenger queuing.

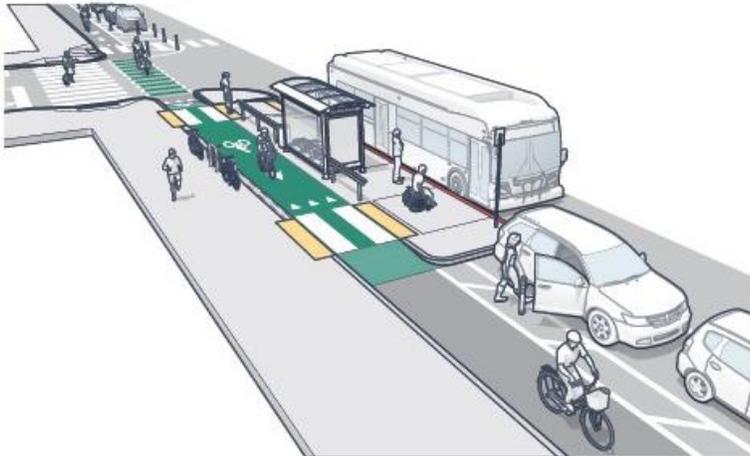
### Interaction with Transit

To accommodate the uninterrupted use of Class IV facilities along transit corridors (i.e., bus) and limit the conflicts between users, the following typologies are included in the AC Transit Multimodal Corridor Guidelines. More details on each typology can be found within the Guide.

**Typology 3**  
**Class IV Bicycle Facility (Separated Bikeway) between the Curb and a General Traffic Lane**



**Typology 4**  
**Class IV Bicycle Facility (Separated Bikeway) between the Curb and a Parking Lane**



**Typology 5**  
**Class IV Bicycle Facility (Two-way Separated Bikeway) between the Curb and a Parking Lane**

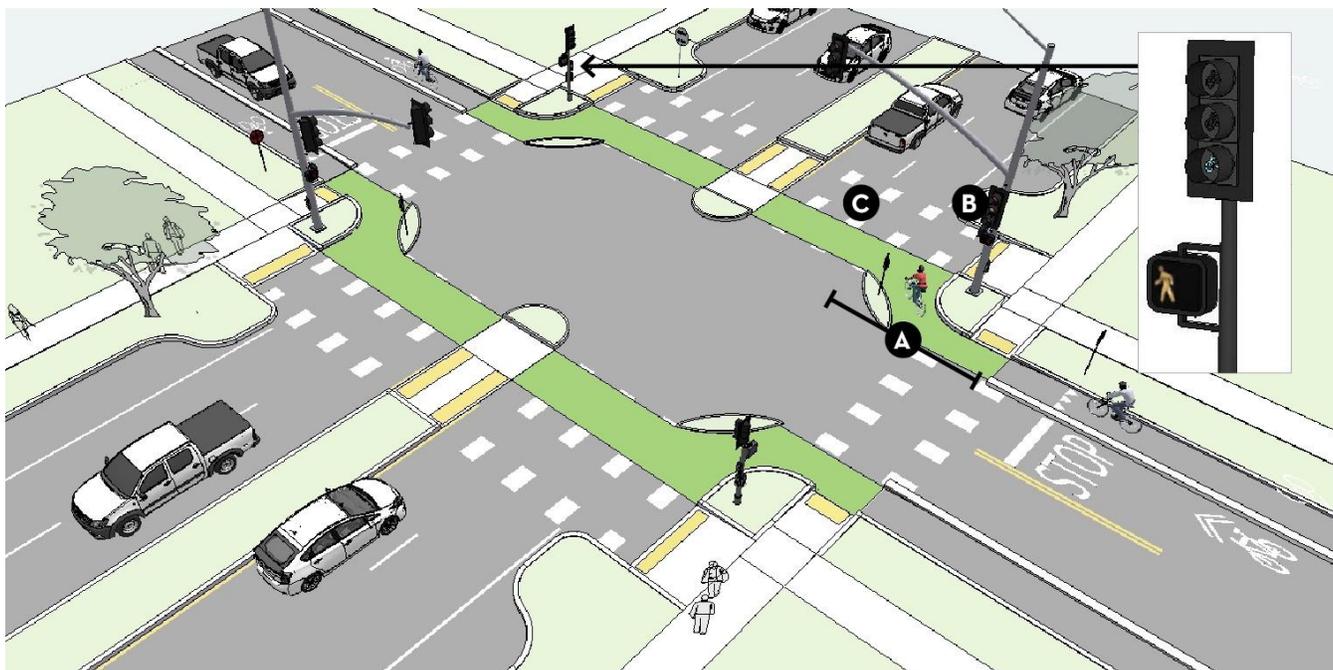


## Protected Intersection

A protected intersection uses a collection of intersection design elements to maximize user comfort within the intersection and promote a high rate of motorists yielding to people bicycling. Protected intersections may be physically protected and/or protected using signal timing. The design maintains a physical separation within the intersection to define the turning paths of motor vehicles, slow vehicle turning speed, and offer a comfortable place for people bicycling to wait at a red signal. Time-based separation applications (e.g., bicycle-only signal phases) may also be used to reduce bicycle-motor vehicle conflicts.

### Typical Application

- Streets with separated bicycle lanes protected by wide buffer or on-street parking.
- Where two separated bicycle lanes intersect and two-stage left-turn movements can be provided for bicycle riders.
- Helps reduce conflicts between right-turning motorists and bicycle riders by reducing turning speeds and providing a forward stop bar for bicycles.
- Where it is desirable to create a curb extension at intersections to reduce pedestrian crossing distance.



### Design Features

- A. Setback bicycle crossing of 16.5-feet allows for one passenger car to queue while yielding. Smaller setback distance is possible in slow-speed, space-constrained conditions.

- B. Corner safety island with a 15–20-foot corner radius slows motor vehicle speeds. Larger radius designs may be possible when paired with a deeper setback, a protected signal phase, or small mountable aprons. Two-stage turning boxes are provided for queuing bicyclists adjacent to corner islands.
- C. Use intersection crossing markings.

### Further Considerations

- Pedestrian crosswalks may need to be further set back from intersections in order to make room for two-stage turning queue boxes.
- Wayfinding and directional signage should be provided to help bicycle riders navigate through the intersection.
- Colored pavement may be used within the corner refuge area to clarify use by people bicycling and discourage use by people walking or driving.
- Intersection approaches with high volumes of right-turning vehicles should provide a dedicated right-turn-only lane paired with a protected signal phase. Protected signal phasing may allow different design dimensions than are described here.
- At signalized intersections, time-based separation may take the form of bicycle-only signal phases or a "leading bicycle interval." These applications typically necessitate additional features, including bicycle-specific signals (with bicycle signal heads) and supplemental signage aimed at bicyclists (e.g., "Bike Signal") and motorists (e.g., "No Turn on Red").



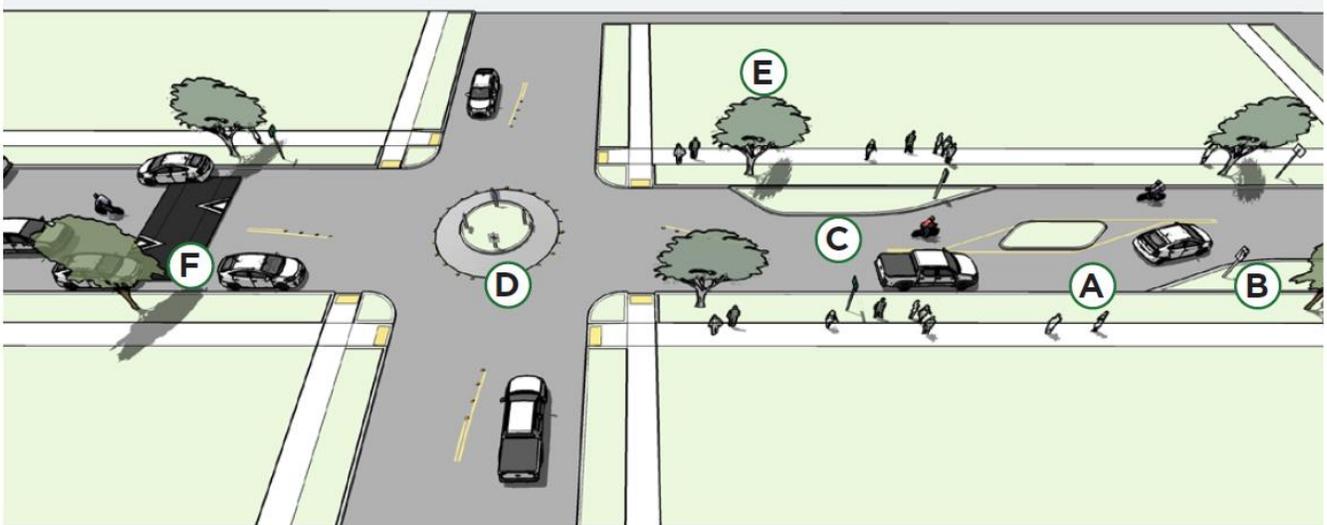
*One corner of a protected intersection (Walnut Avenue and Paseo Padre Parkway) in Fremont, CA*



*Protected intersections can also be made with lower-cost materials including striping and bollards/delineators. This is a paint-and-post installation at Central Avenue/Rydin Way.*

## Traffic Calming Strategies

Traffic calming may include elements intended to reduce the speeds of motor vehicle traffic to be closer to bicyclist travel speeds or may consist of design elements that restrict/divert specific movements for people driving to discourage the use of bicycle boulevard corridors for through travel by automobiles. Traffic calming treatments can cause drivers to slow down by constricting the roadway space or requiring careful maneuvering. Such measures may reduce the design speed of a street and can be used in conjunction with reduced speed limits to reinforce the expectation of lowered speeds. They can also lower vehicle volumes by physically or operationally reconfiguring corridors and intersections along the route.



### Typical Application

- Use traffic calming to:
  - Maintain an 85th percentile speed below 20 mph (25 mph maximum).
  - Bring traffic volumes down to 1,500 cars per day (3,000 cars per day maximum). Neighborhood bikeways with daily volumes above this limit should be considered for traffic calming measures.

### Design Features

#### Speed Reduction

- A. Median islands create a pinch point for traffic in the center of the roadway and offer shorter crossing distances for pedestrians when used in tandem with a marked crossing.
- B. Chicanes slow drivers by requiring vehicles to shift laterally through narrowed lanes and reducing what would otherwise be uninterrupted sightlines.
- C. Pinch points, chokers, or curb extensions restrict motorists from operating at high speeds on local streets by visually narrowing the roadway.
- D. Neighborhood traffic circles reduce traffic speed at intersections by requiring motorists to move cautiously through conflict points.
- E. Street trees narrow a driver's visual field, subconsciously queuing drivers to slow down.
- F. Maintain a minimum clear width of 14 feet with a constricted length of at least 20 feet in the direction of travel.

#### Volume Reduction

- Partial closure diverters allow bicyclists to proceed straight across the intersection but forces motorists to turn left or right. All turns from the major street onto the

bikeway are prohibited. Curb extensions can be incorporated with stormwater management features and/or a mountable island.

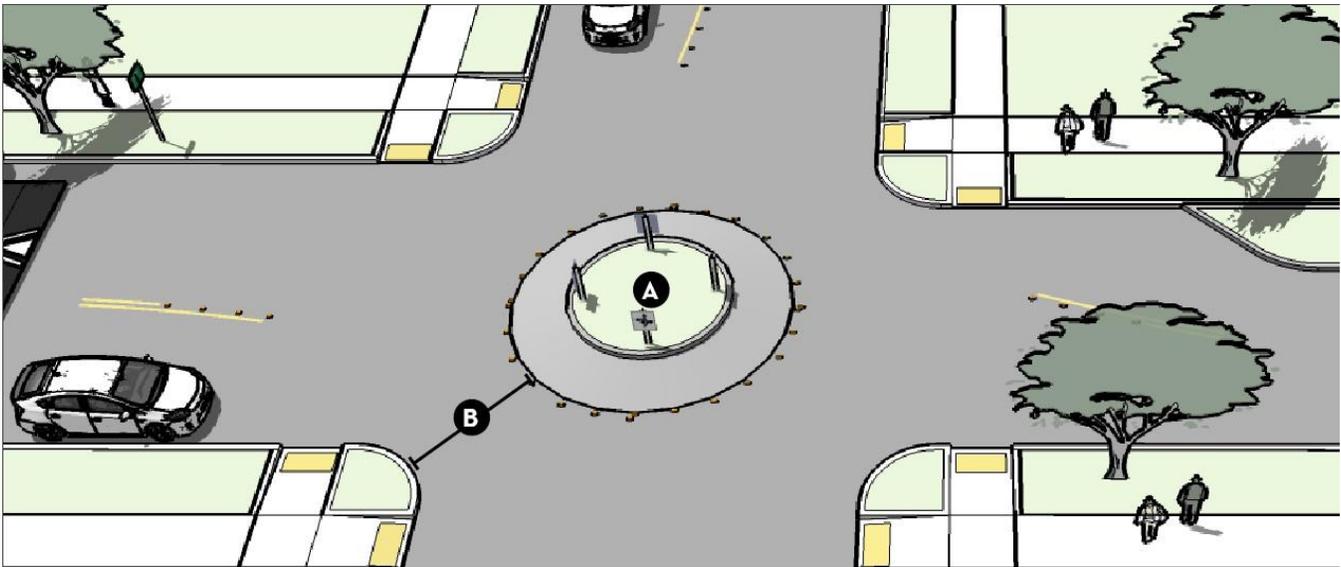
- Right-in/right-out diverters force motorists to turn right while bicyclists can continue straight through the intersection. The island can provide a through bike lane or bicycle access to reduce conflicts with right-turning vehicles. Left turns from the major street onto the bikeway are prohibited, while right turns are still allowed.
- Median refuge island diverters restrict through and left-turn vehicle movements along the bikeway while providing refuge for bicyclists to cross one direction of traffic at a time. This treatment prohibits left turns from the major street onto the bikeway, while right turns are still allowed.
- Full diverters block all motor vehicles from continuing on a neighborhood bikeway, while bicyclists can continue unrestricted. Full closures can be constructed to be accessible to emergency vehicles.

## Traffic Circles

Traffic circles are a type of horizontal speed management typically installed along low-speed, low-volume streets and bicycle boulevards. They are raised islands located in the center of intersections that narrow the roadway and require motorists and bicyclists to reduce their speed to navigate around.

### Typical Application

- Traffic circles can be an effective traffic calming tool on bicycle boulevards and other low-speed, low-volume bicycle routes with less than 2,000 AADT.
- Placing traffic circles at concurrent intersection locations can have enhanced traffic calming effects.
- Are often installed to replace stop signs at intersections along a bike boulevard.
- Should be installed in consultation with neighborhood residents and emergency vehicle operators.



### Design Features

- A. Traffic circle radius depends on roadway width and curb radii to provide adequate horizontal deflection.
- B. Distance from the traffic circle to the curb edge should be approximately 15' to provide sufficient emergency vehicle access.

### Further Considerations

- At intersections with a minor street, stop signs should be placed on the minor street approaches.

- At intersections of two bike boulevards, all approaches should yield to oncoming traffic.
- Traffic circles can feature raised curbs and/or mountable aprons to provide access for emergency vehicles.
- Approaches can feature mini channelization islands or pavement markings to narrow the roadway further and delineate travelways.
- The visual footprint of the traffic circle can be expanded in the intersection with integrated colored pavement or visually patterned surface treatments.
- Traffic circles can be landscaped but must be maintained to preserve sightlines.

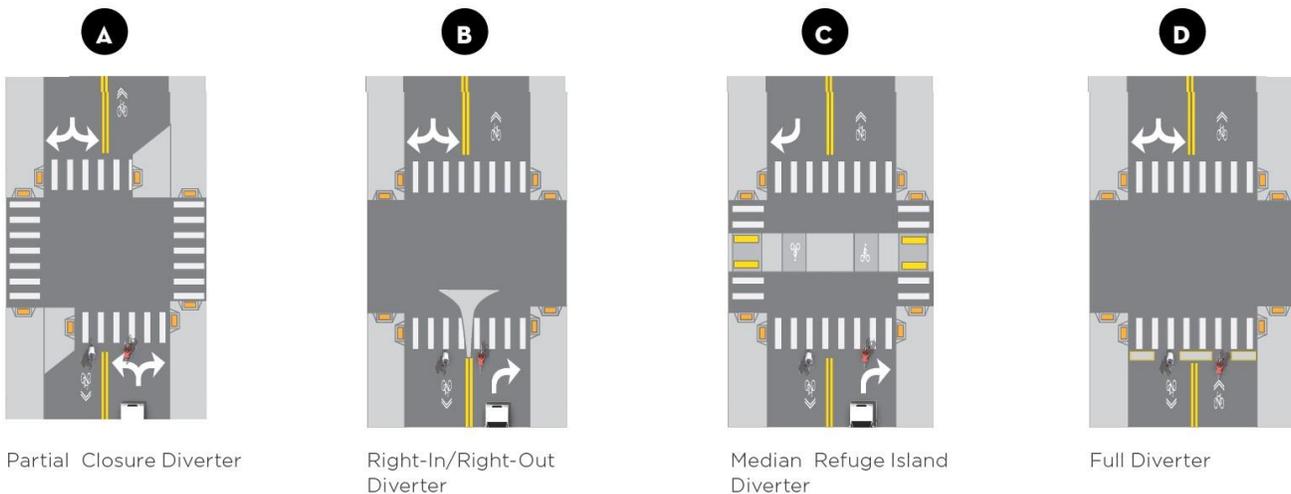
## Traffic Diverters

Traffic diverters are an effective traffic volume management tool that allows bicycles and emergency vehicles to proceed through an intersection but restrict all other vehicle through-movements (requiring vehicles to turn right). Traffic diverters are installed on local roadways designated as bicycle boulevards.

### Typical Application

- Traffic diversion reduces vehicle volumes on bicycle boulevards.
- Existing non-landscaped traffic diverters without cut-throughs can be retrofitted to allow bicycles and emergency vehicles through access.
- Traffic diverter designs should be developed in consultation with neighborhood residents and emergency vehicle operators.
- Design and neighborhood outreach processes should inform the type and precise location of diverters, considering traffic volumes and the direction of the diversion. The goal should be to route motorized traffic to the nearest collector or major street.

### Traffic Calming Treatments to Reduce Motor Vehicle Volumes



### Design Features – Volume Management

- Partial closure diverters allow bicyclists to proceed straight across the intersection but forces motorists to turn left or right. All turns from the major street onto the bikeway are prohibited. Curb extensions with stormwater management features and/or a mountable island can be included.
- Right-in/right-out diverters force motorists to turn right while bicyclists can continue straight through the intersection. The island can provide a through bike lane or

bicycle access to reduce conflicts with right-turning vehicles. Left turns from the major street onto the bikeway are prohibited, while right turns are still allowed. See Toucan Signalized Crossing for signalized intersection configuration.

- C. Median refuge island diverters restrict through and left-turn vehicle movements along the bikeway and provide a refuge for bicyclists to cross one direction of traffic at a time. This treatment prohibits left turns from the major street onto the bikeway, while right turns are still allowed.
- D. Full/Diagonal diverters block all motor vehicles from continuing on a neighborhood bikeway, while bicyclists can continue unrestricted. Full closures can be constructed to preserve emergency vehicles access.

### Further Considerations

- Traffic diverters can be landscaped to enhance the overall attractiveness of the bike boulevard.
- Colored concrete pavers and visually dramatic striping should be used to further delineate the diverter from the roadway and reinforce the vehicle turn restriction.
- At-grade curb cuts or mountable curbs provide convenient access for bicycles.
- Bollards, stanchions, and remaining metal and concrete "staples" on existing traffic diverters should be removed. These obstacles pose a crash hazard to bicyclists, and they can be replaced with small, properly designed median islands.



*Traffic diverters in Berkeley, CA*

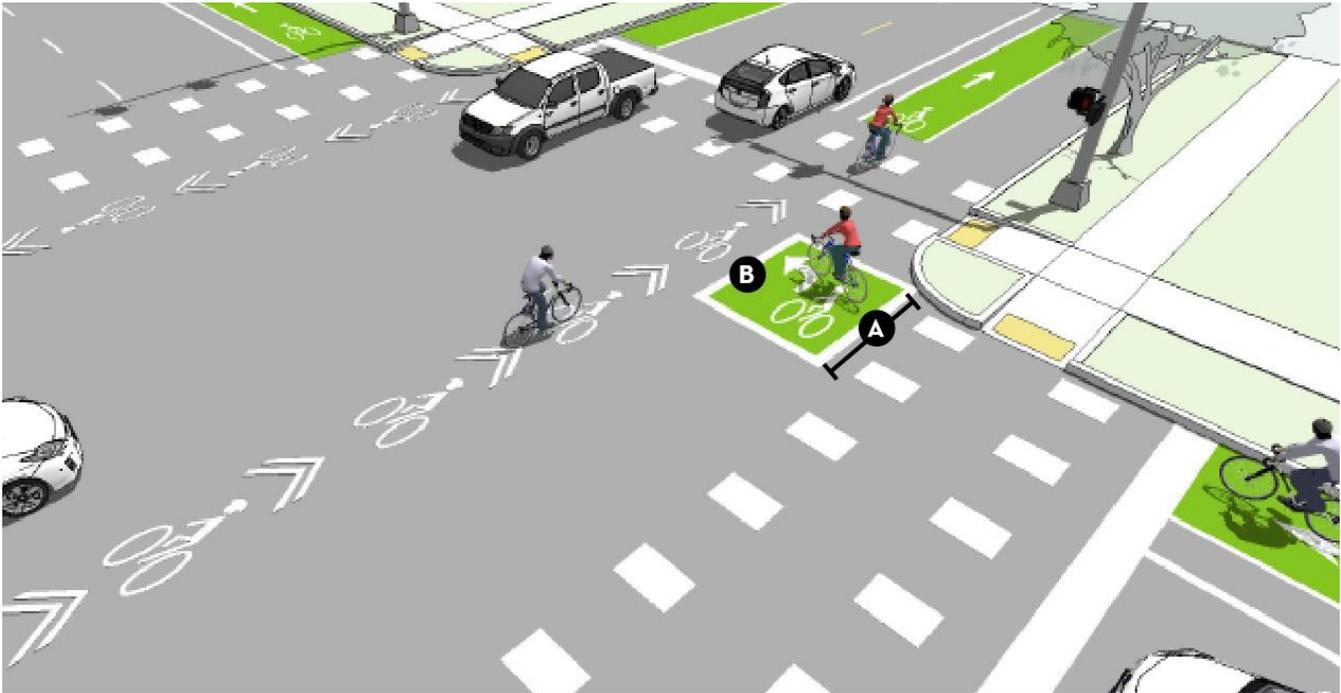
## Intersection Treatments

### Two-Stage Turn Boxes

Two-stage turn boxes offer bicyclists a safe way to make turns at multilane signalized intersections from a physically separated or conventional bike lane. On physically separated bike lanes, bicyclists are often unable to merge into traffic to turn due to physical separation, making the provision of two-stage turn boxes critical.

#### Typical Application

- Streets with high vehicle speeds and/or traffic volumes
- At intersections with multilane roads with signalized intersections.
- At signalized intersections with a high number of bicyclists making a left turn from a right-side facility.



#### Design Features

The two-stage turn box shall be placed in a protected area. Typically, this is within the shadow of an on-street parking lane or protected bike lane buffer area and should be placed in front of the crosswalk to avoid conflict with pedestrians.

- 8-foot x 6-foot preferred depth of bicycle storage area (6-foot x 3-foot minimum).
- Bicycle stencil and turn arrow pavement markings shall be used to indicate proper bicycle direction and positioning.

## Further Considerations

- Consider providing a "No Turn on Red" (CAMUTCD R10-11) on the cross street to prevent motor vehicles from entering the turn box.
- Design guidance for two-stage turns applies to both bike lanes and separated bikeways.
- Two-stage turn boxes reduce conflicts in multiple ways: from keeping bicyclists from queuing in a bike lane or crosswalk and by separating turning bicyclists from through vehicles.
- The bicyclist capacity of a two-stage turn box is influenced by physical dimension (how many bicyclists it can contain) and signal phasing (how frequently the box clears).
- Treatment has interim approval status from Caltrans (IA-18).



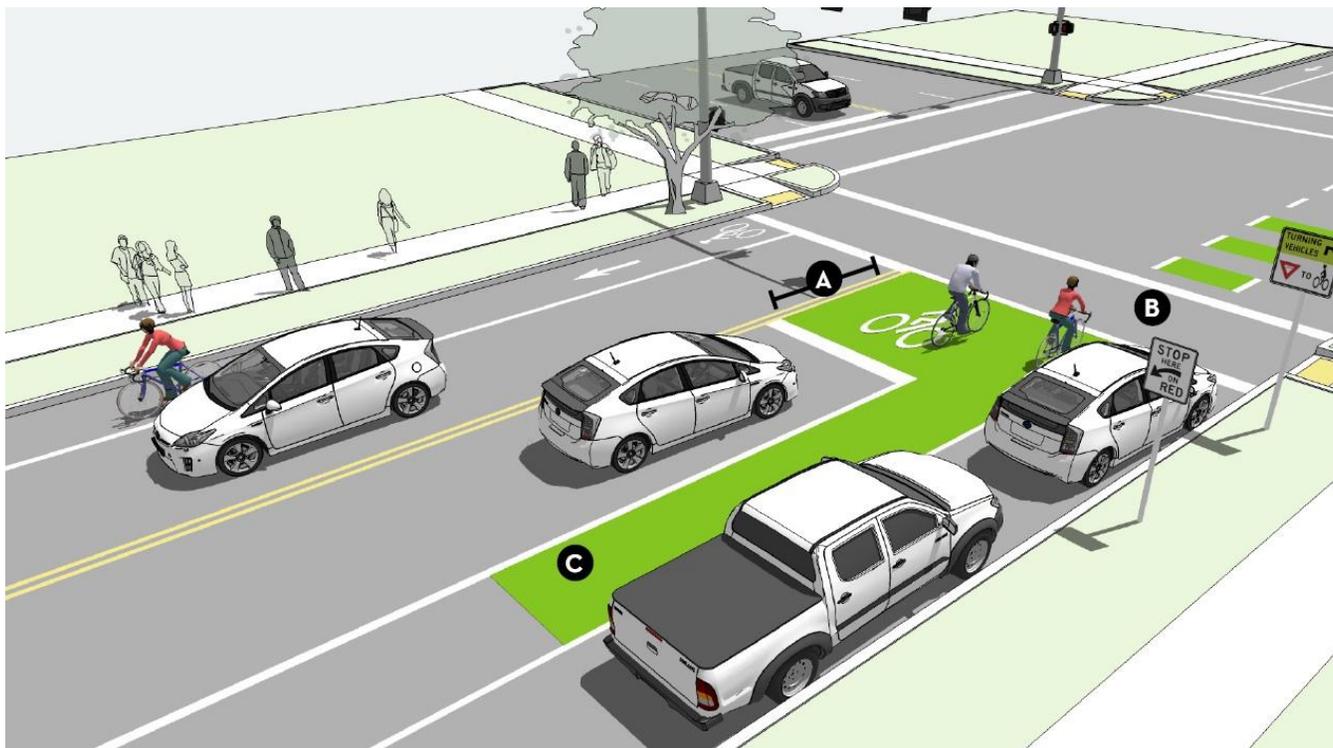
*Two-stage turn box in downtown San José.*

## Bike Box

A bike box is an experimental treatment that provides bicyclists with a safe and visible space to get in front of queuing traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box. On a green signal, all bicyclists can quickly clear the intersection. This treatment is currently under experiment and has not been approved by Caltrans/FHWA.

### Typical Application

- At potential areas of conflict between bicyclists and turning vehicles, such as right or left turn locations.
- At signalized intersections with high bicycle volumes.
- At signalized intersections with high vehicle volumes.



### Design Features

- 14-foot minimum depth from back of crosswalk to motor vehicle stop bar.
- A "No Turn on Red" (CAMUTCD R10-11) or "No Right Turn on Red" (CAMUTCD R13A) sign shall be installed overhead to prevent vehicles from entering the bike box (Refer to CVC 22101 for the signage). A "Stop Here on Red" (CAMUTCD R10-6) sign should be post-mounted at the stop line to reinforce observance of the stop line.

C. A 50-foot ingress lane should be used to provide access to the box. The use of green-colored pavement is optional.

### Further Considerations

- This treatment positions bicycles together, so that on a green signal, all bicyclists can quickly clear the intersection, minimizing conflict and delay to transit or other traffic.
- Pedestrians also benefit from bike boxes, as they experience reduced vehicle encroachment into the crosswalk.
- Treatment has interim approval from Caltrans (IA-20).



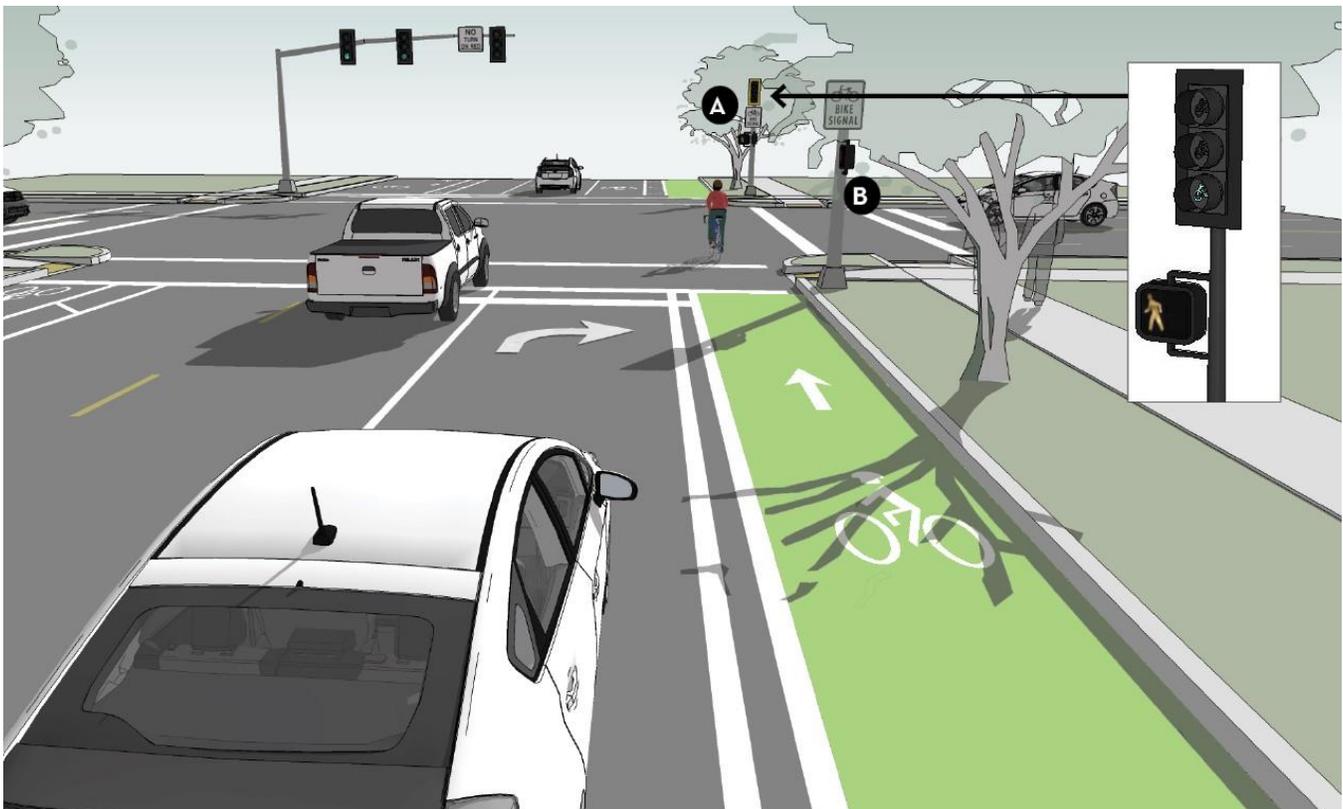
*Bike box on California Drive at the Broadway intersection in Burlingame, CA.*

## Protected Bicycle Signal Phase

Protected bicycle lane crossings of signalized intersections can be accomplished through the use of a bicycle signal phase which reduces conflicts with motor vehicles by separating bicycle movements from any conflicting motor vehicle movements. Bicycle signals are traditional three-lens signal heads with green, yellow, and red bicycle stenciled lenses.

### Typical Application

- Two-way protected bike lanes with contraflow bicycle movement or at locations with increased conflict points that warrant protected operation.
- Bicyclists moving on a green or yellow signal indication in a bicycle signal shall not be in conflict with any simultaneous motor vehicle movement at the signalized location.
- Right (or left) turns on red should be prohibited in locations where such operation would conflict with a green bicycle signal indication.



### Design Features

- A. An additional "Bicycle Signal" sign should be installed below the bicycle signal head.

- B. Designs for bicycles at signalized crossings should allow bicyclists to trigger signals and safely maneuver the crossing.

On bikeways, signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists. (CAMUTCD 9D.02)

### **Further Considerations**

- A bicycle signal should be considered for use only when the volume/collision or volume/geometric warrants have been met. (CAMUTCD 4C.102)
- FHWA has approved bicycle signals for use if they comply with requirements from Caltrans Interim Approval IA-16. Bicycle Signals are not approved for use in conjunction with Pedestrian Hybrid Beacons.
- Bicyclists typically need more time to travel through an intersection than motor vehicles. Green light times should be determined using the bicycle crossing time for standing bicycles.
- Bicycle detection and actuation systems include user-activated buttons mounted on a pole, loop detectors that trigger a change in the traffic signal when a bicycle is detected, and video detection cameras that use digital image processing to detect a difference in the image at a location.

## Leading Bicycle Interval

Vehicle conflicts can occur when drivers performing turning movements do not see or yield to bicyclists who have the right-of-way. Bicyclists may also arrive at an intersection late or may not have any indication of how much time they have to cross the intersection safely. Bicycle traffic signal enhancements can be made to provide bicyclists with a head start, called a Leading Bicycle Interval.

### Typical Application

- Leading Bicycle Intervals (LBI) provides bicyclists with a priority head start across the intersection.
- Leading Bicycle Intervals (LBI) are used to reduce right turn and permissive left-turn vehicle and bicycle conflicts.
- At locations where increased bicyclist stop compliance is needed.
- Can be paired with Leading Pedestrian Intervals (LPI).



*Bicyclists receive a green bike signal indication in advance of adjacent travel lane*



*Visibility Limited signal faces reduce likelihood that motorists in adjacent travel lanes mistake the bike signal location*

## Further Considerations

- These signal enhancements facilitate safer, more predictable, and conspicuous crossing conditions. The Leading Bicycle Interval provides additional time for bicyclists who may need more time to cross the street, such as the elderly and children.
- Leading Bicycle Intervals are considered a successful application of bike signals as approved under current FHWA Interim Approval for Optional Use of Bicycle Signal Faces (IA-16).
- See Traffic Signal Detection and Actuation for more information on detection and actuation devices.

## Traffic Signal Detection and Actuation

At fully signalized intersections, bicycle crossings are typically accomplished through the use of a standard green signal indication for Class II and III bikeways. Several traffic signal enhancements can be made to improve detection and actuation and better accommodate bicyclists. An exclusive bicycle phase provided by bicycle signals offers the highest level of service and protection, especially for Class I and IV bikeways, but features the same detection and actuation methods used at intersections with standard traffic signals. See Protected Bicycle Signal Phase (above) for more information on bicycle signals.

### Typical Application

- Bicycle detection and actuation are used to alert the signal controller of bicycle crossing demand on a particular approach. Proper bicycle detection should meet at least two primary criteria: 1) accurately detect bicyclists, and 2) provide clear guidance to bicyclists on how to actuate detection (e.g., what button to push or where to stand). Additionally, new technologies are being developed to provide feedback to bicyclists once they have been detected to increase the likelihood of stop compliance.
- Detection mechanisms can also provide bicyclists with an extended green time before the signal turns yellow so that bicyclists of all abilities can reach the far side of the intersection.
- All new or modified traffic signals in California must be equipped for bicyclist detection or be placed on permanent recall or fixed time operation. (Caltrans Traffic Operations Policy Directive (TOPD) 09-06.
- Detection shall be placed where bicyclists are intended to travel and/or wait.
- On bicycle priority corridors with on-street bike lanes or separated bikeways, consider the use of advance detection placed 100-200' upstream of the intersection to provide an early trigger to the signal system and reduce bicyclist delay.

### Design Features

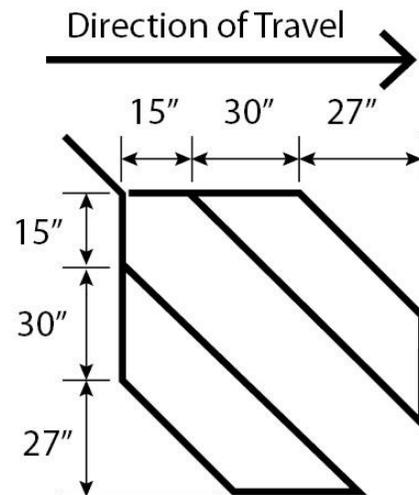
Bicycle detection and actuation systems include user-activated buttons mounted on a pole facing the street, In-pavement loop detectors that trigger a change in the traffic signal when a bicycle is detected, video detection cameras that use digital image processing to detect a change in the image at a location, and/or Remote Traffic Microwave Sensor Detection (RTMS) which uses frequency modulated continuous wave radio signals to detect objects in the roadway.

### Push Button Actuation



Bicycle push button actuators are positioned to allow bicycle riders in roadway to stop traffic on busy cross-streets.

### Type D Loop Detector



Type D loop detector have been shown to most reliably detect bicyclists at all points over their surface.

### Further Considerations

- The location of push-buttons should not require bicyclists to dismount or be rerouted out of the way or onto the sidewalk to activate the phase. Signage should supplement the signal to alert bicyclists of the required activation to prompt the green phase.
- In-pavement Type D Loop detectors are induction circuits installed within the roadway surface to detect bicyclists as they wait for the signal. This allows the bicyclists to stay within the lane of travel. Loop detectors should be sufficiently sensitive to detect bicyclists and be marked with pavement markings instructing bicyclists on where to stand. CAMUTCD provides guidance on stencil markings and signage related to loop detectors.
- Remote Traffic Microwave Sensor Detection (RTMS) is unaffected by temperature and lighting, which can affect standard video detection.
- Bicyclists typically need more time to travel through an intersection than motor vehicles. Green light times should be determined using the bicycle crossing time for standing bicycles. See Leading Bicycle Interval for more information on extending the green phase with bicycle signals.

## Bicycle Parking

Bicycle parking is typically divided into short-term and long-term parking. Short-term parking is meant to accommodate bicyclists who park for up to two hours, e.g., shoppers, post office customers, and library patrons. Long-term parking, such as bike lockers, is for riders who park over two hours, e.g., employees, students, and residents. The installation of bike racks is subject to environmental, security, right-of-way, maintenance, and property owner factors.



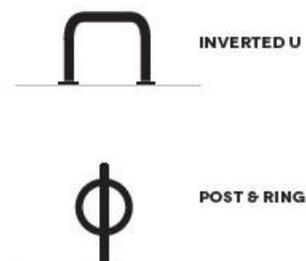
Source: APBP

The following guidance is compiled from the Association of Pedestrian and Bicycle Professionals' Essentials of Bike Parking (2015). Please reference the Guide for additional information.

### Short-Term Parking

Short-term parking should meet the needs of people parking their bicycle for 2-hours or less. Secure and well utilized short-term bike parking depends on two primary factors:

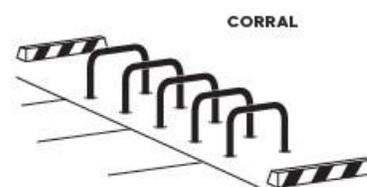
- Proximity to the users' destinations (minimize out of direction travel)
- Ease of use (easily found and self-explanatory)



### Site Planning

#### Location

Short-term bike parking should be visible from and close to the entrance it serves—50' or less is a good benchmark. Weather-protected parking makes bicycle transportation more viable for daily and year-round use, and it can reduce the motivation for users to bring wet bicycles into buildings. Area lighting is essential for any location likely to see use outside of daylight hours.



Source: APBP

### Security

All racks must be sturdy and well-anchored, but location determines the security of short-term parking as much as any other factor. Users seek out parking that is visible to the public, and they particularly value racks that can be seen from within the destination. Areas with a high incidence of bicycle theft may justify specific security features such as specialty racks, tamper-proof mounting techniques, or active surveillance.

## Bike Corrals

In areas with limited sidewalk space and strong bicycle activity, bike parking can be placed on-street in "bike corrals" located in the street area adjacent to the curb (i.e., in replacing one of two vehicle parking spots). A corral can generally fit 8 to 12 bicycles when replacing a single auto parking space. APBP's complete Bicycle Parking Guidelines provide details about designing and siting bike corrals.

## Long-Term Parking

Long-term parking should meet the needs of people parking their bicycle for over 2-hours or longer. Users of long-term parking typically place a higher value on security and weather protection when considering parking options. Long-term parking can take a variety of forms, including:

- Room within a residential building or workplace.
- Secure enclosure within a parking garage.
- Cluster of lockers (typically at transit centers).
- Staffed parking location (typically coupled with other bike-related services). These can also contain amenities like clothes lockers or showers.
- In some instances, these may be located on private property for the exclusive use of residents or employees.



Source: APBP

## Site Planning

### Location

Appropriate locations for long-term parking vary with context. Long-term parking users are typically willing to trade a degree of convenience for weather protection and increased security. Long-term installations emphasize physical security above public visibility. Signage may be needed for first-time users.

### Security

Security is paramount for quality long-term parking. Access to parked bicycles can be limited individually (as with lockers) or in groups (as with locked bike rooms or other secure enclosures). Options for access control include user-supplied locks, keys, smart cards, and other technologies.

## Further Considerations

### Density

The competition of uses for high-security and sheltered locations creates particular pressure on long-term parking to fit more bicycles in less space. Consider rack systems designed to

increase parking density when parking needs cannot be met with standard racks and spacing. Increasing density without careful attention to user needs can create parking that excludes people because of age, ability, or bicycle type. This may result in people parking bicycles in other less desirable places or choosing not to bike at all.

**Bicycle Design Variety**

Long-term parking facilities should anticipate the presence of a variety of bicycles and accessories, including—depending on context—recumbents, trailers, children’s bikes, long-tails, and others. To accommodate trailers and long bikes, a portion of the racks should be on the ground and should have an additional 36” of in-line clearance.

**Bicycle Rack Selection Criteria**

The following are recommended bicycle rack styles for low- and high-density situations. When properly designed and installed, the following racks can be used in a wide variety of placements. The quality and durability of racks can vary by manufacturer and design/type. It is recommended to research and pilot bike rack types before committing to a specific brand/model. Reference the complete parking guide for additional details and specifications.

**INVERTED U**  
also called  
staple, loop



Common style appropriate for many uses; two points of ground contact. Can be installed in series on rails to create a free-standing parking area in variable quantities. Available in many variations.

**POST & RING**



Common style appropriate for many uses; one point of ground contact. Compared to inverted-U racks, these are less prone to unintended perpendicular parking. Products exist for converting unused parking meter posts.

**WHEELWELL-  
SECURE**



Includes an element that cradles one wheel. Design and performance vary by manufacturer; typically contains bikes well, which is desirable for long-term parking and in large-scale installations (e.g. campus); accommodates fewer bicycle types and attachments than the two styles above.

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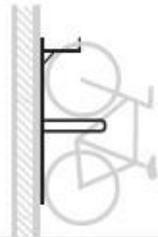
The following racks can also be considered in high-density parking situations. These racks may not meet the same security, ease of use, and other performance metrics as the above racks. Still, these can be very beneficial in certain situations, especially when some of the shortcomings are mitigated (i.e., high-density racks in an attended location). Consider including a mix of rack types to ensure accommodation for various bicycle types (i.e., recumbents or children’s bikes) and users (i.e., racks on the ground for people who can’t lift their bike). Reference the complete parking guide for additional details and specifications.

**STAGGERED WHEELWELL-SECURE**



Variation of the wheelwell-secure rack designed to stagger handlebars vertically or horizontally to increase parking density. Reduces usability and limits kinds of bikes accommodated, but contains bikes well and aids in fitting more parking in constrained spaces.

**VERTICAL**



Typically used for high-density indoor parking. Not accessible to all users or all bikes, but can be used in combination with on-ground parking to increase overall parking density. Creates safety concerns not inherent to on-ground parking.

**TWO-TIER**



Typically used for high-density indoor parking. Performance varies widely. Models for public use include lift assist for upper-tier parking. Recommend testing before purchasing. Creates safety concerns not inherent to on-ground parking, and requires maintenance for moving parts.

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There are many styles of bicycle racks that do not provide sufficient security or durability for use in most situations. Richmond’s Bicycle Master Plan (2011) states “racks should...allow for the locking of both the frame and wheels of a bicycle.” Thus, the following styles of bicycle racks should be avoided when possible:

- Wave
- Schoolyard
- Coat hanger
- Bollard
- Spiral
- Swing Arm Secured

## Rack Materials and Coatings

The following table provides information on relative cost, durability, and cautions for the following materials and coatings (in parenthesis): carbon steel (galvanized), carbon steel (powder coated), carbon steel (thermoplastic), and Stainless steel (no coating). Reference the complete parking guide for additional details and specifications.

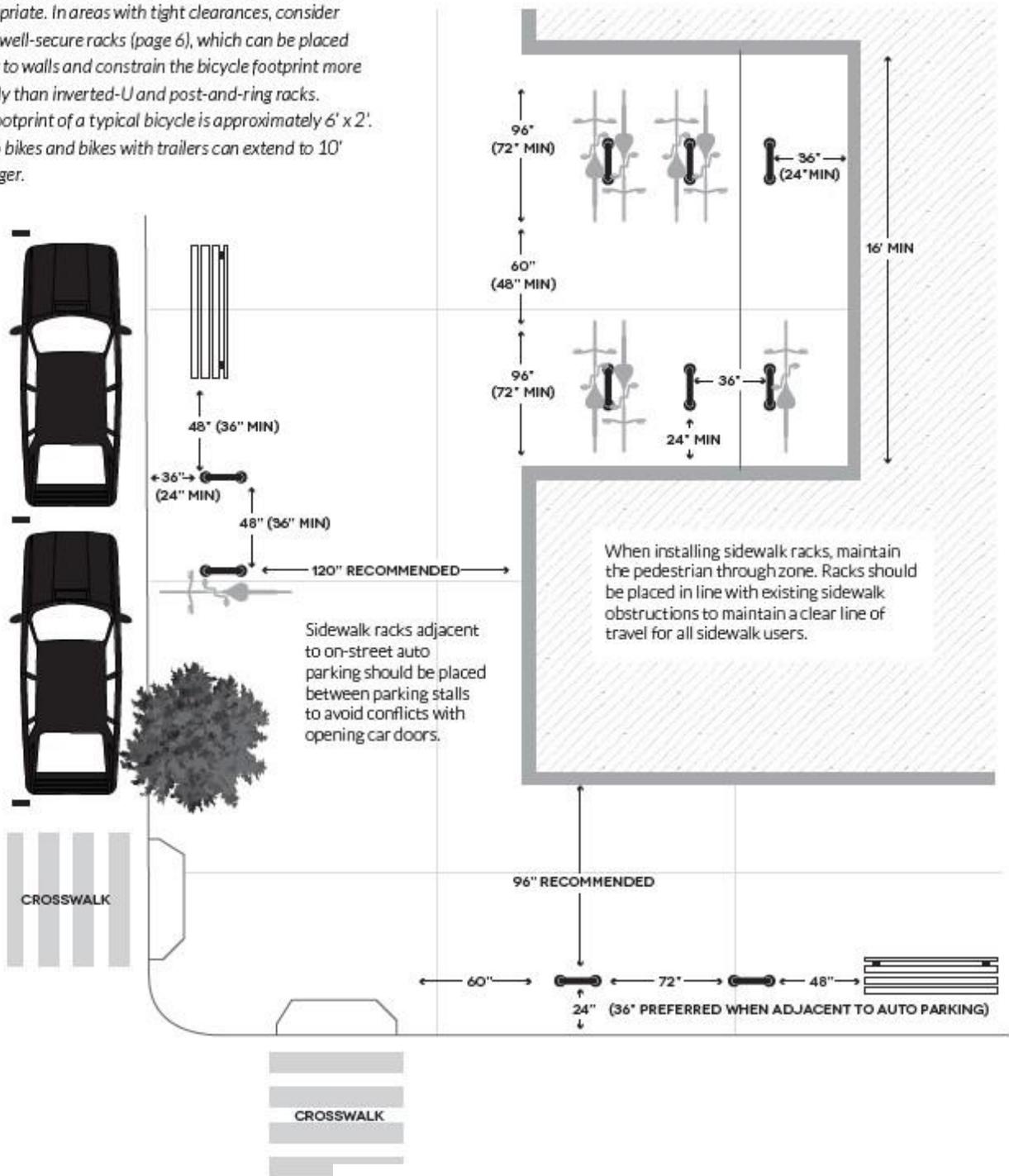
<b>RACK MATERIAL - COATING</b>	<b>RELATIVE PURCHASE COST</b>	<b>DURABILITY</b>	<b>CAUTIONS</b>
<b>Carbon steel - galvanized</b>	Usually lowest	Highly durable and low-maintenance; touch-up, if required, is easy and blends seamlessly	Utilitarian appearance; can be slightly rough to the touch
<b>Carbon steel - powder coat* (TGIC or similar)</b>	Generally marginally higher than galvanized	Poor durability	Requires ongoing maintenance; generally not durable enough for long service exposed to weather; not durable enough for large-scale public installations
<b>Carbon steel - thermoplastic</b>	Intermediate	Good durability	Appearance degrades over time with scratches and wear; not as durable as galvanized or stainless
<b>Stainless steel - no coating needed, but may be machined for appearance</b>	Highest	Low-maintenance and highest durability; most resistant to cutting	Can be a target for theft because of salvage value; maintaining appearance can be difficult in some locations

*\* When applied to carbon steel, TGIC powder coat should be applied over a zinc-rich primer or galvanization to prevent the spread of rust beneath the surface or at nicks in the finish.*

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## Placement

The following minimum spacing requirements apply to some common installations of fixtures like inverted-U or post-and-ring racks that park one bicycle roughly centered on each side of the rack. Recommended clearances are given first, with minimums in parentheses where appropriate. In areas with tight clearances, consider wheelwell-secure racks (page 6), which can be placed closer to walls and constrain the bicycle footprint more reliably than inverted-U and post-and-ring racks. The footprint of a typical bicycle is approximately 6' x 2'. Cargo bikes and bikes with trailers can extend to 10' or longer.

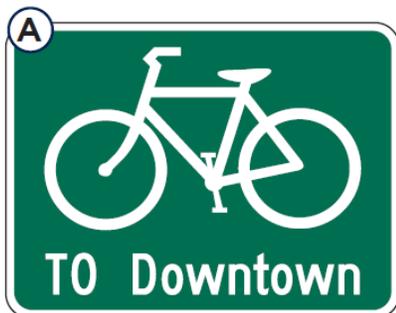


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## Wayfinding

### Sign Types

The ability to navigate through an area is informed by landmarks, natural features, and other visual cues. Signs throughout the city should indicate to bicyclists the direction of travel, the locations of destinations, and the travel time/distance to those destinations. A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes.



D11-1c



D1-1



D11-1/D1-3a

### Typical Application

- There are many potential applications for wayfinding signage in a citywide bicycle network. Overall, signs can increase users' comfort with and accessibility to the bicycle network and achieve the following:
  - Help users identify the best routes to destinations
  - Help address misconceptions about time and distance
  - Help overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., interested but concerned bicyclists).

### Design Features

- A.** Confirmation signs indicate to bicyclists that they are on a designated bikeway, make motorists aware of the bicycle route, can include destinations and distance/time but do not include arrows.
- B.** Turn signs indicate where a bikeway turns from one street onto another street or from one trail to another. These can be used with pavement markings and include destinations and arrows.
- C.** Decision signs inform bicyclists of the designated bike route to access key destinations. These include destinations, arrows, and distances. Travel times are optional but recommended.



Wayfinding signs can include a local community identification logo. This example is from Oakland, CA.



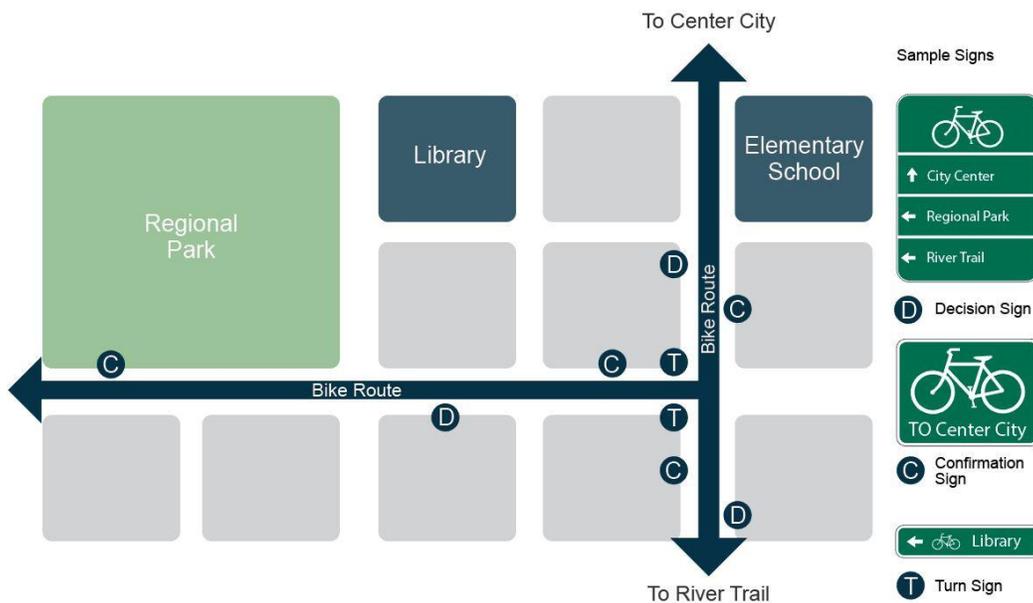
Custom street signs can also act as a type of confirmation sign to let all users know the street is prioritized for bicyclists. This example is from Berkeley, CA.

### Further Considerations

- Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes.
- Too many road signs tend to clutter the right-of-way. It is recommended that provided the sign location satisfies established signage standards, the signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.
- A citywide bicycle wayfinding signage plan would identify:
  - Sign locations
  - Sign type - what type of sign should be used based on its intended function.
  - Destinations to be highlighted on each sign - key destinations for bicyclists
  - Approximate distance and travel time to each destination
- Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.
- Check wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear and replace signage along the bikeway network as-needed.
- Language presented in the Community Wayfinding section of the MUTCD provides some flexibility on logos and colors, which may be integrated into a comprehensive system that reflects the local identity and integrates with pedestrian and vehicular wayfinding signage.

## Sign Placement

Signs are placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes. The graphic below provides example placements for each sign type.



### Typical Application

#### Confirmation Signs

- Placed every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 feet of a turn or decision sign).
- Should be placed soon after turns to confirm destination(s). Pavement markings can also act as confirmation that a bicyclist is on a preferred route.

#### Turn Signs

- Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through).
- Pavement markings can also indicate the need to turn to the bicyclist.



**Decision Signs**

- Near-side of intersections in advance of a junction with another bicycle route.
- Along a route to indicate a nearby destination.

**Design Features**

- MUTCD guidelines must be followed for wayfinding sign placement, including mounting height and lateral placement from the path's edge or roadway.
- Pavement markings can be used to reinforce routes and directional signage.

**Further Considerations**

- It can be helpful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to 5 miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park or school) may be included on signage up to one mile away.

Appendix

C

# Project Funding



**To:** Patrick Phelan, Lina Velasco, Denee Evans, Lydia Elias; City of Richmond

**From:** Ben Frazier, Mauricio Hernández; Alta Planning + Design

**Date:** March 2, 2022 (FINAL)

**Re:** Travel Safe Richmond - Bicycle and Pedestrian Project Funding Sources

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The following memo provides information about available funding sources for the City of Richmond to implement the proposed Bicycle and Pedestrian improvements as part of the Travel Safe Richmond project. The memo has been organized to include Local and Regional funding sources as well as State and Federal programs which fund the implementation and maintenance of bicycle and pedestrian facilities. A comparative matrix has also been included at the end of the memo which summarizes the activities covered under each funding source.

## Funding Sources

### Local and Regional Funding Sources

#### **Contra Costa County Measure J**

Measure J provides funding for countywide and local transportation projects and programs through the year 2034. Eligible improvements include pedestrian, bicycle, and trail facilities, local streets and road maintenance, and transportation for livable communities.

*Funds are programmed by the Contra Costa Transportation Authority.*

#### **Transportation Fund for Clean Air, County Program Manager Fund**

The Transportation Fund for Clean Air funds bicycle facilities including paths, lanes, routes, lockers, and racks.

*Funds are programmed by the Contra Costa Transportation Authority.*

#### **511 Contra Costa Bike Rack and Locker Program**

511 Contra Costa is a countywide program that strives to reduce traffic congestions and improve air quality by providing the public with resources and tools that promote mobility options beyond driving alone. Eligible projects include bicycle parking racks and lockers.

*Funds are programmed by Contra Costa County.*

### **One Bay Area Grant**

The One Bay Area grant program (OBAG) emphasizes funding for projects within Priority Development Areas (PDAs) in the region that are in-line with housing and land use goals. Projects that are within or provide access to these PDAs could qualify for OBAG grants.

*Funds are programmed by the Contra Costa Transportation Authority.*

### **Transportation Development Act Article 3**

Transportation Development Act Article 3 (TDA 3) provides funding annually for bicycle and pedestrian projects. Two percent of TDA 3 funds collected within the county are used for TDA 3 projects. MTC policies require that all projects be reviewed by a BPAC or similar body before approval.

*Funds are programmed by the Contra Costa Transportation Authority.*

### **Bicycle Facilities Grant Program**

Throughout the nine-county Bay Area, the Bicycle Facilities Grant program strives to reduce emissions from on- road vehicles and improve air quality by helping residents and commuters shift to bicycling and walking as alternatives to driving for short distances and first- and-last mile trips. The Bay Area Air Quality Management District (BAAQMD) has grant programs that fund both on-street facilities and bicycle parking facilities. Funding comes from the BAAQMD's Transportation Fund for Clean Air.

*Funds are programmed by the Bay Area Air Quality Management District.*

### **Climate Initiatives Innovative Grants Fund**

MTC's Climate Initiatives Program promotes innovative ways to reduce greenhouse gas emissions in the Bay Area; and taps federal funding for a pair of competitive grant programs. Innovative grants of \$1 million and up are used to support high-impact projects that can be replicated around the region.

*Funds are programmed by the Metropolitan Transportation Commission.*

### **New Development or Redevelopment/Rehabilitation**

Future new development and redevelopment projects including new road construction, resurfacing, and construction projects are one method of providing pedestrian improvements and bike facilities. To ensure that pedestrian and bicycle improvements are included in these projects, it is important that the review process includes an individual (designated active transportation coordinator) or group (BPAC) to monitor the review process.

*Funds are programmed by the City of Richmond.*

## **Assessment Districts**

Different types of assessment districts can be used to fund the construction and maintenance of bikeway facilities. Examples include Mello-Roos Community Facility Districts, Infrastructure Financing Districts (SB 308), Open Space Districts, Special Assessment Districts, Tax Increment Financing, or Lighting and Landscape Districts. These types of districts have specific requirements relating to the establishment and use of funds.

*Funds are programmed by the City of Richmond.*

## **Impact Fees**

Another potential local source of funding are developer impact fees, typically tied to trip generation and traffic impacts as a result of proposed projects. A developer may be required to help mitigate the overall impact of vehicular trips by paying an impact fee; the City should ensure that planning policies consider bicycle and pedestrian planning, design, and construction costs to be an eligible use of these fees.

*Funds are programmed by the City of Richmond.*

## State and Federal Grant Programs

### California Active Transportation Program

California's Active Transportation Program (ATP) funds infrastructure and programmatic projects that support the program goals of shifting trips to walking and bicycling, reducing greenhouse gas emissions, and improving public health. Competitive application cycles occur every one to two years, typically in the spring or early summer. Eligible projects include construction of bicycling and walking facilities, new or expanded programmatic activities, or projects that include a combination of infrastructure and non-infrastructure components. Typically, no local match is required, though extra points are awarded to applicants who do identify matching funds.

*Funds are programmed by the California Transportation Commission (CTC).*

### Sustainable Transportation Planning Grants

Caltrans Sustainable Transportation Planning Grants are available to communities for planning, study, and design work to identify and evaluate projects, including conducting outreach or implementing pilot projects. Communities are typically required to provide an 11.47 percent local match, but staff time or in-kind donations are eligible to be used for the match provided the required documentation is submitted.

*Funds are programmed by Caltrans.*

### Highway Safety Improvement Program

Caltrans offers Highway Safety Improvement Program (HSIP) grants every one to two years. Projects on any publicly owned road or active transportation facility are eligible, including bicycle and pedestrian improvements. HSIP focuses on projects that explicitly address documented safety challenges through proven countermeasures, are implementation-ready, and demonstrate cost-effectiveness.

*Funds are programmed by Caltrans.*

### Solutions for Congested Corridors Program

Funded by SB1, the Congested Corridors Program strives to reduce congestion in highly traveled and congested roads through performance improvements that balance transportation improvements, community impacts, and environmental benefits. This program can fund a wide array of improvements including bicycle facilities and pedestrian facilities. Eligible projects must be detailed in an approved corridor-focused planning document. These projects must include aspects that benefit all modes of transportation using an array of strategies that can change travel behavior, dedicate right of way for bikes and transit, and reduce vehicle miles traveled.

*Funds are programmed by the California Transportation Commission.*

## **Office of Traffic Safety**

Under the Fixing America's Surface Transportation (FAST) Act, five percent of Section 405 funds are dedicated to addressing nonmotorized safety. These funds may be used for law enforcement training related to pedestrian and bicycle safety, enforcement campaigns, and public education and awareness campaigns.

*Funds are programmed by the California Office of Traffic Safety.*

## **Recreational Trails Program**

The Recreational Trails Program helps provide recreational trails for both motorized and non-motorized trail use. Eligible products include trail maintenance and restoration, trailside and trailhead facilities, equipment for maintenance, new trail construction, and more.

*Funds are programmed by the California Department of Parks and Recreation.*

## **Affordable Housing and Sustainable Communities Program**

The Affordable Housing and Sustainable Communities Program (AHSC) funds land-use, housing, transportation, and land preservation projects that support infill and compact development that reduces greenhouse gas (GHG) emissions. Projects must fall within one of three project area types: transit-oriented development, integrated connectivity project, or rural innovation project areas. Fundable activities include affordable housing developments, sustainable transportation infrastructure, transportation-related amenities, and program costs.

*Funds are programmed by the Strategic Growth Council and implemented by the Department of Housing and Community Development.*

## **Urban Greening Grants**

Urban Greening Grants support the development of green infrastructure projects that reduce GHG emissions and provide multiple benefits. Projects must include one of three criteria, most relevantly: reduce commute vehicle miles traveled by constructing bicycle paths, bicycle lanes or pedestrian facilities that provide safe routes for travel between residences, workplaces, commercial centers, and schools. Eligible projects include green streets and alleyways and non-motorized urban trails that provide safe routes for travel between residences, workplaces, commercial centers, and schools.

*Funds are programmed by the California Natural Resources Agency.*

## **Statewide Park Program (SPP)**

The Statewide Park Program solicits competitive grants to fund new parks and recreation opportunities in critically underserved communities across California. Funds can be used to create and expand/renovate existing parks. All projects must include at least one "recreation feature" which includes non-motorized trails. No match is required.

*Funds are programmed by the California Department of Parks and Recreation.*

## **RAISE Grants**

The Rebuilding America Infrastructure with Sustainability and Equity program supports projects that improve transportation system safety, improve accessibility, and improve sustainability. Eligible projects must have quantifiable environmental benefits, serve disadvantaged communities, and address equity concerns in the project's design. Eligible projects range between \$5 million and \$25 million. RAISE grants can fund both planning and capital projects. A 20% local match is required except in rural areas.

*Funds are programmed by the United States Department of Transportation.*

## **Congestion Mitigation and Air Quality Improvement (CMAQ) Program**

CMAQ funding supports projects that reduce congestion and help jurisdictions meet National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter. Projects must be included in the local MPO's transportation improvement plan.

*Funds are programmed by Caltrans and the Metropolitan Transportation Commission.*

## **Surface Transportation Block Grants**

These grants are used to maintain and improve the performance on any federal-aid highway, bridges, and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects. Additional Transportation Alternatives set aside funds for active transportation, and active transportation access to transit improvements are also available.

*Funds are programmed by Caltrans and the Metropolitan Transportation Commission.*

## Other State Funds

### **Senate Bill 1: Local Partnership Program**

This program provides local and regional agencies that have passed sales tax measures, developer fees or other transportation-imposed fees to fund road maintenance and rehabilitation, sound walls, and other transportation improvement projects. Jurisdictions with these taxes or fees are then eligible for a formulaic annual distribution of no less than \$100,000. These jurisdictions are also eligible for a competitive grant program. Local Partnership Program funds can be used for a wide variety of transportation purposes including roadway rehabilitation and construction, transit capital and infrastructure, bicycle and pedestrian improvements, and green infrastructure.

*Funds are programmed by California Transportation Commission.*

### **Senate Bill 1: Road Maintenance and Rehabilitation Program**

Senate Bill 1 created the Road Maintenance and Rehabilitation Program (RMRP) to address deferred maintenance on state highways and local road systems. Program funds can be spent on both design and construction efforts. On-street active transportation-related maintenance projects are eligible if program maintenance and other thresholds are met. Funds are allocated to eligible jurisdictions.

*Funds are programmed by the State Controller's Office.*

Funding Source	Planning/ Design/ Construction	On-Street Bikeways/ End-of- Trip	Trails	Safe Routes to School	Safe Routes to Transit	Crossings/ Intersections	Programs	Studies
<b>Local and Regional Opportunities</b>								
Contra Costa County Measure J (CCTA)	P/D/C	●	●	●	●	●	●	
Transportation Fund for Clean Air, County Program Manager Fund (CCTA)	C	●	●	●	●			
511 Contra Costa Bike Rack and Locker Program (Contra Costa County)	C	●						
One Bay Area Grants (MTC)	D/C	●	●		●			
Transportation Development Act Article 3 (CCTA)	D/C	●	●	●	●	●		
Bicycle Facilities Grant Program (BAAQMD)	C	●						
Climate Initiatives Innovative Grants (MTC)	-					●		
New Developments/Resurfacing Projects (Richmond)	D/C	●	●			●		
Assessment Districts (Richmond)	P/D/C	●	●	●	●	●	●	●
Impact Fees (Richmond)	P/D/C	●	●	●	●	●	●	●
<b>State and Federal Opportunities</b>								
Active Transportation Program (CTC)	P/D/C	●	●	●	●	●	●	●
Sustainable Transportation Planning Grants (Caltrans)	P							●
Highway Safety Improvement Program (Caltrans)	D/C	●		●	●	●		
Solutions for Congested Corridors (CTC)	C	●	●			●		
Office of Traffic Safety (CA OTS)	-						●	
Recreational Trails Program (CA DPR)	C		●					
Affordable Housing & Sustainable Communities (CA HCD)	C	●			●		●	
Urban Greening Grants (CA NRA)	C	●	●	●	●			
Statewide Park Program (CA DPR)	C		●					
RAISE Grants (USDOT)	P/D/C	●	●	●	●	●		●

Funding Opportunities and Matrix

Funding Source	Planning/ Design/ Construction	On-Street Bikeways/ End-of- Trip	Trails	Safe Routes to School	Safe Routes to Transit	Crossings/ Intersections	Programs	Studies
Congestion Mitigation and Air Quality (Caltrans and MTC)	C	●	●	●	●	●		
Surface Transportation Block Grants (Caltrans and MTC)	C	●	●	●	●	●		
<b>Other State Funds</b>								
Local Partnership Program (CTC)	C	●		●	●	●		
Road Maintenance and Rehabilitation Program (Controller's Office)	D/C	●		●	●			

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