



City of Richmond Bicycle Master Plan



October 2011



Prepared by **Fehr & Peers**
In association with **Eisen | Letunic**



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Steven Tam, Engineering Services Department

Richmond City Council

Mayor Gayle McLaughlin
Vice Mayor Jeff Ritterman
Councilmember Nathaniel Bates
Councilmember Tom Butt
Councilmember Courtland "Corky" Booze
Councilmember Jim Rogers
Councilmember Jovanka Beckles

Richmond Bicycle/ Pedestrian Committee

Nancy Baer, Chair
Rick Beal
Liz Bittner
Brian Drayton
Adrienne Harris

Miriam Joscelyn
Catalin Kaser
Bill Pinkham
Raul Ramirez
Debbie Richerson
Coirre Riley
Tony Sustak

Trails for Richmond Action Committee

Bruce Bayaert
Bruce Brubaker

Plan Prepared By

Fehr & Peers
Eisen|Letunic

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Wheelin' in the Watershed Event
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List of Acronyms

Below are some of the acronyms used in the Bicycle Master Plan:

ADA	American with Disabilities Act
BMP	(Richmond) Bicycle Master Plan
BPAC	(Richmond) Bicycle/Pedestrian Advisory Committee
BTA	Bicycle Transportation Account
CBN	(Contra Costa) Countywide Bicycle Network
CCTA	Contra Costa Transportation Authority
EBRPD	East Bay Regional Park District
MTC	Metropolitan Transportation Commission
RCRA	Richmond Community Redevelopment Agency
TRAC	Trails for Richmond Action Committee

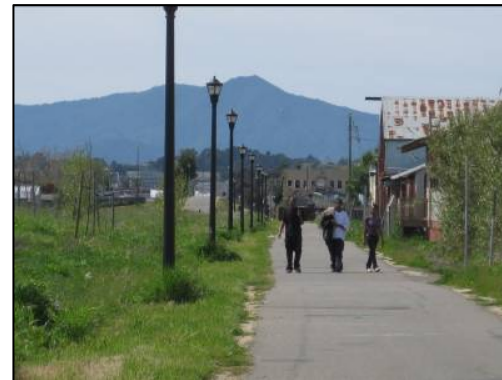
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Executive Summary

BICYCLING IS INCREASINGLY recognized as an important component of the transportation system. Not only can it reduce traffic, air pollution and energy consumption, it can also improve the health and quality of life of our residents and communities. The City of Richmond is among those far-sighted cities that recognizes the contribution that bicycling can make to mobility, environmental quality and community vitality. The City's [DRAFT] General Plan—the master planning document for the community—contains numerous policies and action items to make Richmond a bicycle-friendly city; these include developing citywide bicycle routes and safe routes to schools, implementing traffic calming strategies, expanding the network of multi-use paths and identifying priority safety improvements.

PURPOSE OF THE BICYCLE MASTER PLAN

One of the most important purposes of the Richmond Bicycle Master Plan (BMP) is to set in motion the policies and action items from the



*Looking west towards Mt Tamalpais
on the Richmond Greenway*

[DRAFT] General Plan. The BMP sets forth a blueprint for completing a 145-mile system of bikeways and support facilities within the City of Richmond. It builds upon the existing system of on-street and off-street bicycle facilities throughout the City, focusing on connec-

tions between neighborhoods, safe routes to schools and access to major destinations such as employment centers, stores and shops, parks, trails and open space areas. The Plan also includes criteria for defining

different types of bicycle facilities, a listing of priority projects, recommendations for increasing the supply of bicycle parking, design standards and education and safety programs.

CONTENTS OF THE PLAN

The BMP consists of the following sections:

- Executive Summary
- Chapter 1, Introduction
- Chapter 2, Related Plans
- Chapter 3, Policy Framework
- Chapter 4, Existing Bicycle Network
- Chapter 5, Proposed Bicycle Network
- Chapter 6, Bicycle Parking
- Chapter 7, Collisions
- Chapter 8, Support Programs
- Chapter 9, Funding and Implementation
- Appendix A, Proposed Project Lists and Design Guidelines

GOALS

The Richmond Bicycle Master Plan has four primary goals, and a set of objectives by which to measure them:

Goal ①: Expand the city's bicycle routes and parking facilities into an extensive, well-connected and well-designed network, and improve and maintain these facilities over time.

Objective: Increase the number of bikeway miles by 75 percent, complete all gaps in the Bay Trail and double the number of bicycle parking spaces.

Goal ②: Increase the number of people of all ages and backgrounds who bicycle for transportation, recreation and health.

Objective: Double the number of trips made by bicycle.

Goal ③: Make the streets safer for bicyclists, not only during the day but also at night.

Objective: Reduce the number of reported bicycle fatalities and injuries by 25 percent (even as the number of bicyclists increases).

Goal ④: Incorporate the needs and concerns of cyclists in all transportation and development projects.

Objective: Adopt and implement a "Complete Streets" and "Routine Accommodation" policies, and bicycle-friendly design standards and guidelines for streets and developments.

IMPLEMENTATION PLAN

The City has already accomplished a great deal to encourage bicycling in Richmond. Richmond has the longest and most scenic section of the Bay Trail and is blessed with more shoreline than any other city in the Bay Area. In addition, the Richmond Greenway provides a critical east-west Class I pathway connection across the center of the City. As such, the City has the potential to be a magnet for people seeking healthy lifestyles, particularly as the City's bicycle network develops.

To fully achieve the vision set forth in this Plan, close coordination among City agencies, neighboring jurisdictions, and the community-at-large will be required. The Richmond Bicycle/Pedestrian Advisory Committee, comprised of both community members and City staff, will play a central role in stewarding the implementation of this Plan.

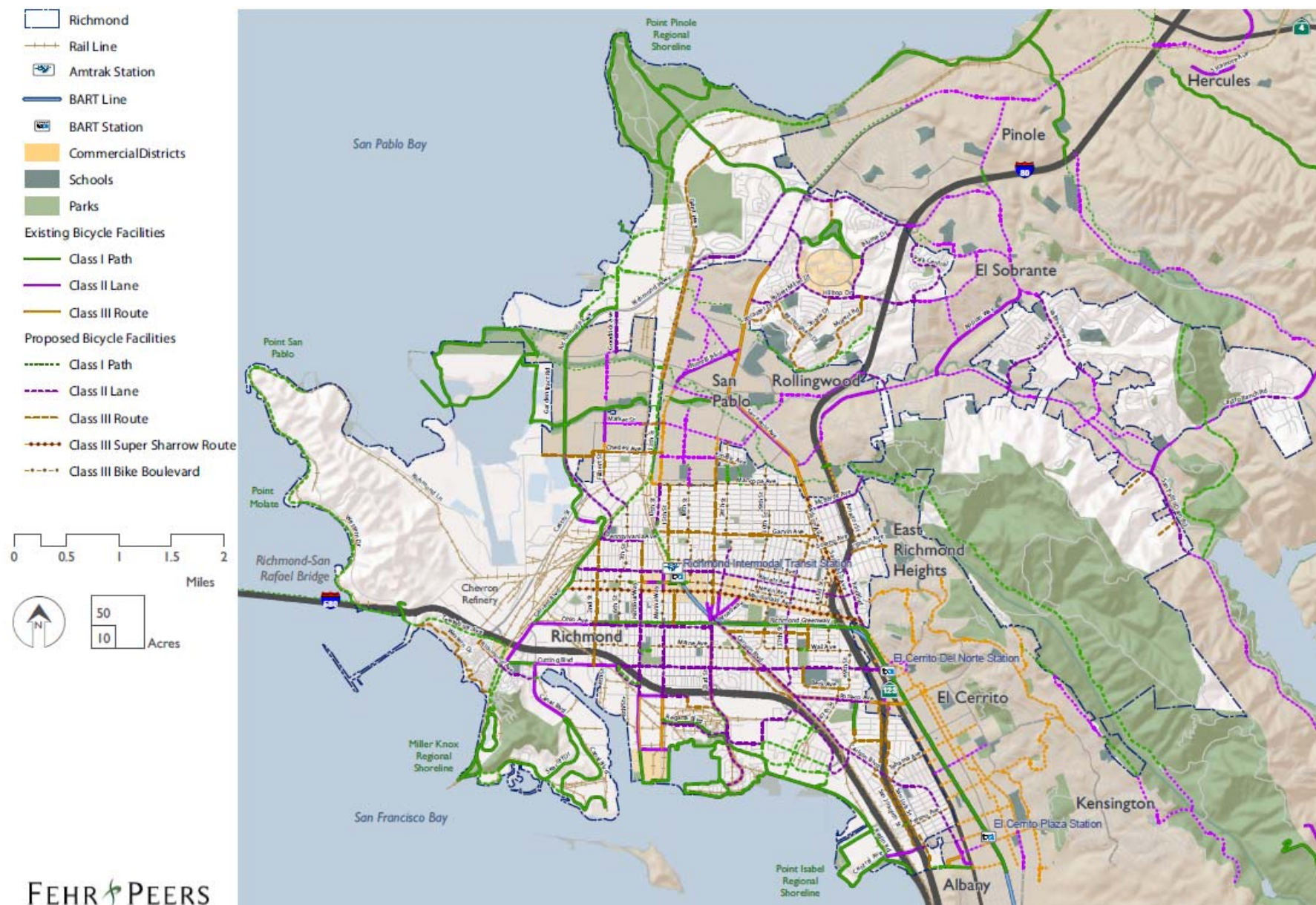
The Implementation Plan in Chapter 9 identifies the key implementation tasks, primary responsible agencies, a recommended timeline, as well as the relative cost and priority of each task. Upon adoption, the City should craft a five-year work plan based on this plan.

The following map illustrates the Citywide Existing and Proposed Bikeway Network. The proposed system includes a total of over 100 miles of new bikeway facilities in addition to the 40 miles currently in place. A complete list and description of proposed bikeways is included in Appendix A and is organized in the following way:

- Central Richmond – North-south and east-west routes
- Hilltop Area
- El Sobrante Valley
- The Bay Trail and Wildcat Creek Trail segments

A primary goal is to provide continuous bikeways with the greatest degree of bicycle comfort possible. These on- and off-street bicycle facilities will provide local and regional access across Richmond and to neighboring jurisdictions. This map exemplifies the vision for bicycling in Richmond and reflects the planning recommendations set forth in this Master Plan.

Map ES-1 | Existing and proposed bicycle network



1 . Introduction

BICYCLING IS INCREASINGLY recognized as an important component of the transportation system. Not only can it reduce traffic, air pollution and energy consumption, it can also improve the health and quality of life of our residents and communities. The City of Richmond is among those far-sighted cities that recognizes the contribution that bicycling can make to mobility, environmental quality and community vitality. The City's General Plan—the master planning document for the community—contains numerous policies and action items to make Richmond a bicycle-friendly city; these include developing citywide bicycle routes and safe routes to schools, implementing traffic calming strategies, expanding the network of multi-use paths and identifying priority safety improvements.

One of the most important purposes of the Richmond Bicycle Master Plan (BMP) is to set in motion the policies and action items from the General Plan. The BMP does this primarily by proposing a system of

bikeways connecting neighborhoods and key activity centers throughout the city, and also by including recommendations for increasing the supply of bicycle parking and improving cyclists' safety. This chapter describes the process to develop the BMP (including the extent of public involvement), describes the contents of the plan and outlines how those contents meet the requirements of the California Department of Transportation (Caltrans) for bicycle plans.

HISTORY OF TRANSPORTATION IN RICHMOND

Richmond has a rich history of what today would be described as sustainable transportation. Richmond was founded and plotted in the pre-automobile era.

- Block sizes are small and conducive to walking and bicycling as they promote route directness, lower auto speeds and spreading

traffic across multiple narrow streets (as opposed to suburban models of limited number of very wide through streets like are found in the Hilltop Area).

- Transit was and is an integral part of Richmond with a major BART/AMTRAK station and robust bus service. In the 1940's Richmond also had streetcar transit service (the Key System) on portions of Cutting Boulevard and Macdonald Avenue.
- Richmond also has neighborhood-scaled schools, well-distributed commercial corridors, and a Downtown district with historic treasures and great character.

With the advent of the automobile, I-80 and the Richmond-San-Rafael Bridge were built. Still later, I-580, the Richmond Parkway and BART were built. These facilities, along with the freight rail systems that were largely built to serve the Richmond Shipyards and other industrial uses, such as Chevron, along the waterfront have created a number of barriers to walking and bicycling in Richmond.

This Plan, along with the Pedestrian Master Plan that was created concurrently, seek to reintroduce opportunities for non-auto modes as envisioned in the City's General Plan. There are tremendous opportunities to expand walking and bicycling facilities as many roads in Richmond are oversized to their current or projected auto travel needs. Cutting Boulevard is the most obvious example, but Harbour Way, Carlson Boulevard, Barrett Avenue are also good examples of streets where existing traffic lanes could be removed and converted to space for walker and bikers.

Re-envisioning Richmond's transportation system as a multi-modal system is key to City and State objectives for reducing greenhouse gas emissions. Perhaps more importantly, it is key to helping the City

achieve an active and healthy community and creating economic development opportunities.



SOUTHERN PACIFIC UNDERPASS, MACDONALD AVENUE, 1911. At the upper right can be seen the Southern Pacific train station, at Sixteenth and Macdonald.

Image Source: Images of America: Richmond, Donald Bastin, 2003

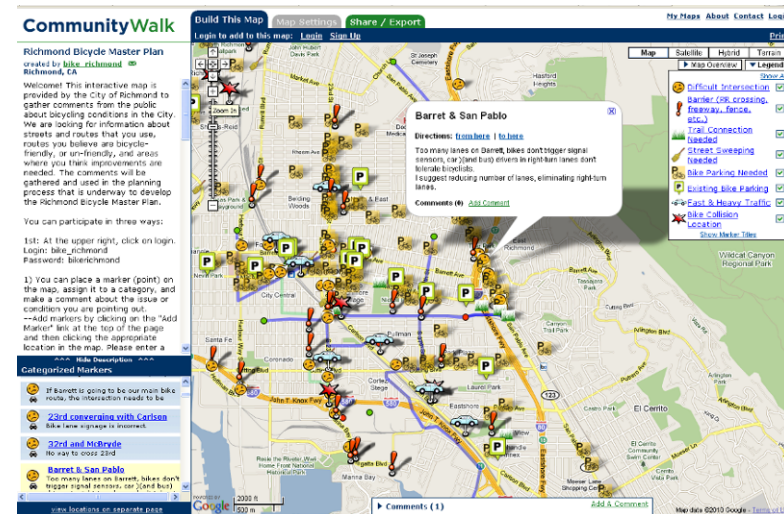
PLAN DEVELOPMENT AND PUBLIC INVOLVEMENT

This section addresses Caltrans' Bicycle Transportation Account (BTA) requirement (h): "A description of the extent of citizen and community involvement in development of the plan, including, but not limited to, letters of support." The BTA is an annual program providing state funds for city and county projects that improve safety and convenience for bicycle commuters.

To ensure that the Bicycle Master Plan reflects the interests and priorities of the Richmond community-at-large, agency and public outreach was a high priority throughout the course of the project.

Outreach activities included the following:

- Regular meetings with Richmond Planning, Engineering, and Re-development Agency staff
- Regular meetings with the Richmond Bicycle/ Pedestrian Advisory Committee (RBPAC)
- A day-long public workshop and "bike-about"
- Participation in community-led bike rides throughout Richmond
- An interactive on-line map for the Richmond community to post issues and opportunities related to existing and future conditions
- Close coordination with the Richmond Pedestrian Plan outreach efforts.



CONTENTS OF THE RICHMOND BICYCLE MASTER PLAN

The BMP consists of the following sections:

- **Executive Summary**
- **Chapter 1, Introduction**
- **Chapter 2, Related Plans:** Summarizes key plans, programs, policies and other planning efforts that will affect and be affected by implementation of the BMP.
- **Chapter 3, Policy Framework:** Formulates the vision, goals, objectives and policies of the BMP.
- **Chapter 4, Existing Bicycle Network:** Discusses existing local conditions relevant to bicycling, including commuting statistics, the city's land use patterns, existing bikeways, challenges to bicycling in Richmond and key opportunities for increasing the number of cyclists.
- **Chapter 5, Proposed Bicycle Network:** Establishes a proposed network of bikeways connecting neighborhoods and key activity centers throughout the city, and includes a map of the network and a list of proposed segments.
- **Chapter 6, Bicycle Parking:** Describes the main types of bicycle parking, provides a list and map of locations in Richmond where bicycle parking can be found and, perhaps most importantly, makes recommendations for increasing the supply of parking.
- **Chapter 7, Collisions:** Analyzes data on traffic collisions involving bicyclists, identifies collision hotspots and recommends to the City

a set of monitoring, evaluation and reporting actions related to collisions.

- **Chapter 8, Support Programs:** Describes existing bicycle safety and education programs in Richmond, and recommends additional or enhanced programs with the potential to improve the state of bicycling in the city.
- **Chapter 9, Funding and Implementation:** Estimates costs to build the proposed bikeway network, prioritizes individual projects on the proposed network and summarizes the main funding sources and programs for bicycle improvements.
- **Appendix A, Design Guidelines:** Provides standards and guidelines for the design of on- and off-street bikeways, bicycle parking, signage and maintenance of facilities.

BTA-REQUIRED ELEMENTS IN THE BMP

As mentioned earlier, Caltrans requires that bicycle plans include certain components, or “elements.” These required elements are listed in Section 891.2 of the California Streets and Highways Code. Table 1, below, summarizes the Caltrans-required elements and lists the pages or sections in the BMP where these requirements are addressed.

- **California Streets and Highways Code, Section 890-894.2:**
www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=890-894.2

Table 1-1 | Conformance with BTA requirements

<i>Requirement</i>	<i>Chapter(s)</i>
a. Number of existing and future bicycle commuters	4
b. Land use and settlement patterns	4
c. Existing and proposed bikeways	5, 6
d. Existing and proposed bicycle parking facilities	7
e. Existing and proposed access to other transportation modes	5, 6
f. Facilities for changing and storing clothes and equipment	7
g. Bicycle safety, education and law enforcement programs	9
h. Citizen and community involvement in development of the plan	1
i. Coordination and consistency with other plans	2
j. Projects proposed in the plan and their priority for implementation	10
k. Past expenditures for bicycle facilities and future financial needs	10

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2 . Related Plans

This chapter addresses BTA requirement (i): “A description of how the bicycle transportation plan has been coordinated and is consistent with other local or regional transportation, air quality, or energy conservation plans, including, but not limited to, programs that provide incentives for bicycle commuting.”

THE CITY OF RICHMOND HOPES that the Bicycle Master Plan (BMP) will have a significant positive impact on bicycling in the city. The BMP, though, is not the only effort aimed at improving conditions for bicyclists in Richmond nor is the City the only entity working toward such a goal. Instead, the BMP will build on and coordinate with a number of plans, projects and policies of other parties. These other efforts are being conducted by a variety of public agencies and are occurring not only at the local level but also at the county, regional and state levels.

This chapter provides an overview of the planning framework surrounding bicycling in Richmond by summarizing the key planning efforts that will affect, and in some cases be affected by, implementation of the BMP. Before doing so, it is worth highlighting the relationship between the BMP and three other planning efforts of particular relevance described in this chapter:

- **Richmond General Plan:** This is the City’s master planning document. As such, all other planning documents must be consistent with it. The BMP advances a number of policies and actions in the General Plan. These include developing citywide bicycle routes; identifying gaps in the network, major travel routes and priority safety improvements; expanding the network of multi-use paths; and implementing the highest industry standards for bicycle improvements and amenities.

- **Richmond Pedestrian Plan:** The City is currently developing its first Pedestrian Plan, which includes goals, conceptual plans and design guidance for enhancing the walking environment. In many instances, the Pedestrian Plan recommendations are congruent with those set forth in this Plan, and efforts should be made to coordinate the implementation of proposed projects.
- **Contra Costa Countywide Bicycle and Pedestrian Plan (CBPP):** The bikeway network and support programs proposed in the BMP have been cross-checked for consistency with those in the CBPP. Such consistency will generally be necessary for the City to obtain Measure J funding for bicycle projects and programs from the Contra Costa Transportation Authority.

We recommend that City of Richmond planners, engineers and other staff responsible for transportation improvements and development-related projects familiarize themselves with the plans, projects and policies outlined in this chapter.

Planning efforts summarized in this chapter

Richmond plans

- General Plan
- Municipal Code
- Pedestrian Plan
- Five-Year Strategic Business Plan 2009-2014
- Community Redevelopment Agency Five-Year Implementation Plan
- Streetscaping and Trail Projects

Other cities' and county plans

- El Cerrito Circulation Plan for Bicyclists and Pedestrians
- Contra Costa Countywide Bicycle and Pedestrian Plan

Regional plans

- San Francisco Bay Trail

- Regional Bicycle Plan for the San Francisco Bay Area
- East Bay Regional Park District Master Plan
- MTC's Complete Streets/Routine Accommodation Policy

State plans

- Caltrans' Complete Streets Policy
- California Complete Streets Act

RICHMOND PLANS

General Plan



A general plan is a long-range planning document intended to guide the physical growth and the social and economic development of a city or county. It expresses a community's vision of its future and contains a jurisdiction's official policy statements related to the distribution of future land uses (both public and private), its transportation system, conservation of natural resources, protection of the public from safety hazards and a number of other development-related topics. The Richmond General Plan is in the process of being updated. The new plan, entitled "Shaping the New 100 Years," is **expected to be adopted in 2011**. The plan addresses locally relevant planning issues under 15 chapters, or subject-specific "elements."

Most of the information and policy statements related to bicycling appear in the **Circulation Element** (Element 4). The element emphasizes a "place-based" transportation planning approach, under which "potential enhancements to the street system must [in general] consider all modes of travel and should be based on a particular street's intended function and design character." The element includes a section on "Walking and Bicycling Patterns and Facilities" (pages 4.7–4.11) and a map of existing and planned Class I, II and III bike

routes (Map 4.1). One of the key findings of the Circulation Element is that “[a]lthough a network of existing streets, sidewalks and trails provide linkages and connectivity between neighborhoods, improvements are needed to enhance safety and comfort for pedestrians and bicyclists.” The five goals of the element are to expand the multimodal circulation system (CR1); promote walkable neighborhoods and livable streets (CR2); create a safe and well-maintained circulation system (CR3); ensure an efficient movement of goods (CR4); and promote sustainable and green practices (CR5). Policies and actions directly related to bicycling include:

[Need to check numbering of policies against adopted version of General Plan.]



Map of existing and planned bicycle and pedestrian improvements from the Richmond General Plan

- Policy CR1.1** **Balanced Modes of Travel:** Encourage multiple modes of travel in the City to enhance mobility for all....

- Policy CR1.3** **An Interconnected Street System:** Promote an interconnected system of streets that adequately serves current and future travel needs. By promoting an interconnected system for streets along with pedestrian, bicycle and transit facilities, the City can support streets that are compatible with surrounding land uses, street function and community character.

- Policy CR1.6** **Safe and Convenient Walking and Bicycling:** Promote walking and bicycling as a safe and convenient mode of transportation.

- Policy CR1.7** **Comprehensive Network of Multi-Use Trails:** Develop a comprehensive network of multi-use trails....

- Policy CR1.10** **Level of Service Standard:** Allow flexible Level of Service (LOS) standards to create streets that balance all modes of travel. Future improvements to major streets and intersections will consider design solutions that support walking, bicycling, and provide comfortable public spaces while continuing to function as thoroughfares that support the movement of vehicles....

- Action CR1.C** **Bicycle and Pedestrian Networks:** Develop citywide bicycle and pedestrian routes to make Richmond a more pedestrian and bicycle-friendly City. Identify gaps in the network, major travel routes and priority safety improvements. Expand the network of multi-use trails and off-street paths. Include connections to open space amenities...the Downtown, recreation destinations, commercial and mixed-use streets, transit stations and schools. Address pedestrian and bicycle connections in parking lots.

Ensure links to the regional trail network including the San Francisco Bay Trail, and consistency with the County Bicycle and Pedestrian Plan....

Action CR1.D Bicycle and Pedestrian Standards: Implement the highest industry standards for bicycle and pedestrian improvements and amenities in new development and redevelopment projects. Include adequate, safe and accessible bicycle parking, drinking fountains, public restrooms, benches, landscaping and lighting. Provide adequate connections to the existing and proposed bicycle and pedestrian network.... [R]equire owners of property along the shoreline to provide maximum feasible public access to the shoreline. Wherever feasible, include a condition to contribute to Bay Trail improvements as part of any large project approval.

Action CR1.E Trails and Greenway Program: Expand multi-use trails and greenways in the City. Provide connector trails and linkages to improve access from inner city neighborhoods to the regional open space in the hills and along the shoreline. Address barriers such as freeways, the Richmond Parkway and railroad tracks that limit shoreline access....

Policy CR2.2 Complete Streets: Promote mixed-use urban streets that balance public transit, walking and bicycling with other modes of travel....

Policy CR2.3 Integrated Bicycle and Pedestrian System: Plan, construct and maintain a safe, comprehensive and integrated bicycle and pedestrian system....

Action CR2.A Community Access and Mobility: Develop access and mobility in new development.... Access and mobility design features should:...Promote bicycle and pedestrian-friendly routes including completion of major trails and pathways like the San Francisco Bay Trail and Richmond Greenway...Include provisions to extract an easement for the completion of the Bay Trail along the Richmond

Shoreline; Strategically coordinate new park development and upgrades with street improvements (green streets, bicycle and pedestrian improvements); [and] propose locations for creek daylighting, creekside trails and other pedestrian-friendly corridors....

Action CR2.B Safe Routes to School: Develop safe routes to school in collaboration with West Contra Costa Unified School District and other educational institutions and service providers. Improve walking and bicycling access and safety to schools and after-school programs.

Action CR2.C Streetscape Improvement: Enhance access, safety and the streetscape experience for pedestrians, bicyclists and transit riders. Focus improvements in areas with the highest need such as the Downtown, mixed-use corridors, key intersections, designated pedestrian priority districts and multi-use trails that connect high-density areas of the City to parks and open space....

Action CR2.D Street Design: New development and redevelopment should include street design that supports public transit, bicycles and walking on all streets, consistent with and tailored to street or trail function and adjacent land use type.... Bicycle-friendly design should address lane widths, street and intersection crossings and parking areas....

Action CR2.E Signage and Wayfinding: Install comprehensive signage and wayfinding elements that addresses all modes of travel including transit, trucks, bicycles, multi-use trails and cars....

Action CR2.F Lower Speed Limit Zone Study: Explore the potential to designate streets around schools, parks and public gathering places as safety zones where the vehicular speed limit may be lowered to 20 miles per hour....

Policy CR3.1 Safety and Accessibility: Enhance safety and accessibility for pedestrians, bicyclists and public transit riders. Promote walking, bicycling and transit use by improving: key

intersections and streets...transit stations and stops...at-grade railroad crossings...and streetscape design....

Policy CR3.2 Adequate Maintenance: Ensure adequate maintenance of transportation facilities such as streets, trails, sidewalks and bicycle paths.

Policy CR3.3 Concurrent Infrastructure Development: Require concurrent infrastructure development for new and redevelopment projects that may have a significant impact on the existing circulation system including streets, trails, sidewalks, bicycle paths and public transit.

Action CR3.A At-Grade Railroad Crossings Improvements: Work with the railroads to improve safety at at-grade railroad crossings. Provide fair-share contributions to improvements where grade separations will enhance safety, community linkages and access for pedestrians, bicyclists and public transit....

Action CR3.B Traffic Calming: Develop strategies to calm traffic on streets that experience speeding or cut-through traffic. Engineering measures should consider emergency vehicle access as well as pedestrian and bicycle circulation and may include traffic circles, curb extensions, stop signs, narrow travel lanes, fewer travel lanes, landscaping and plantings.

Action CR4.A Goods Movement: Identify priority improvements such as grade separation and safety improvements for at-grade railroad crossings to reduce conflicts between different modes of travel.... [E]nsure that track capacity expansion in Richmond is accompanied by safety improvements including grade separation at crossings that carry high traffic, pedestrian and/or bicycle volumes, or have high accident rates....

Action CR5.A Transportation Demand Management: Encourage use of public transit, bicycling and walking in existing and proposed developments through measures that may include

transit subsidies, carshare service, parking cash-out programs, bicycle-share programs, bicycle amenities and facility enhancements.

Action CR5.D City Vehicles Transition: Increase the share of climate-friendly vehicles and use of climate-friendly fuels in the City and consider including bicycles in a corporate fleet where feasible.

Additional bicycle-related policies and actions are scattered throughout other elements of the Richmond General Plan. Key policies and actions not already mentioned above include:

Economic Development Element (Element 1)

Action ED5.A San Pablo Avenue Specific Plan: ...complete and implement the San Pablo Avenue Specific Plan.... Include design and infrastructure features in the Plan that support higher-density and mixed-use development, pedestrian and bicycle uses, public safety and active use and public transit service.

Action ED5.B 23rd Street Specific Plan: ...complete and implement the 23rd Street Specific Plan.... Include design and infrastructure features in the Plan that support higher-density and mixed-use development, pedestrian and bicycle uses, public safety and active use and public transit service.

Policy ED8.4 Public Access to the Shoreline: Improve public access to the Bay. The City supports the expansion of trails, viewpoints and supporting infrastructure to fully capitalize on the Southern Shoreline's prime access to the Bay....

Action ED8.A Southern Shoreline: Guide improvements in the Southern Shoreline Area...including...public access to the shoreline...bicycle and public transit service and amenities that link this area to the rest of the City...and infrastructure improvements such as streetscape, pedestrian-scale lighting, landscaping and grade separations at railroad crossings.

Land Use and Urban Design Element (Element 3)

- Policy LU1.3 A Range of High-Quality Community Facilities and Infrastructure:** Maintain high-quality facilities and infrastructure to serve diverse community needs...[including] multi-use trails....
- Policy LU3.3 Recreation and Tourism Industry:** ...Expand and complete the Bay Trail to enhance regional connections with Richmond's shoreline...
- Policy LU4.1 Richmond Shoreline:** ...develop shoreline parks and trails to increase public access; encourage recreation and tourism activities; and enhance and showcase historic and cultural resources....



Policy LU6.1 Pedestrian and Transit-Oriented Urban Environment: ...Support complete and balanced streets and an expanded multimodal circulation system.... Require new development and improvements to include amenities for pedestrians, bicycles and transit users....

Energy and Climate Change Element (Element 8)

- Policy EC2.6 Private Automobile Use:** Work toward creation of an urban landscape that will reduce reliance on private automobiles. Provide amenities and infrastructure that encourage safe and convenient use of public transit, walking and bicycling....
- Action EC2.F Promote Bicycle Use:** Encourage safe and convenient bicycle use by residents, employees and visitors. Consider

strategies that expand bicycling as a viable mode of transportation for people of all ages and abilities. Encourage businesses to provide bicycle amenities such as secured bicycle parking, showers and lockers for employees who bike to work.

Parks and Recreation Element (Element 10)

- Policy PR1.2 Multimodal Connections to Parks, Open Space and Recreational Facilities:** Improve connections to parks, open space and recreational facilities through an interconnected network of pedestrian-friendly green streets, multimodal corridors and trails. The City should enhance trails and greenways to provide recreational opportunities for residents, connect neighborhoods and community uses, improve access to natural resources and the shoreline and promote walking and bicycling. On-street connections should be pedestrian and bicycle-friendly and incorporate green infrastructure where possible....
- Action PR1.D Parkland Acquisition Plan:** Develop a parkland acquisition plan for achieving better distribution of parks in all neighborhood planning areas of the City and accomplishing an integrated system of parks.... Include considerations for trail and greenway expansion....
- Action PR1.F Shoreline Parks Plan:** ...Trails and greenways along the scenic shoreline should be enhanced to provide recreational opportunities and circulation access and to develop the shoreline as a visitor destination.... The plan should also include: an analysis of gaps and opportunity sites for completing and expanding the Bay Trail; identification of routes and improvements needed to connect the shoreline with core urban areas of the City; bicycle and pedestrian trails to provide local connections between the waterfront and surrounding neighborhoods; and provisions to complete planned regional trails including the San Francisco

Bay Trail, Richmond Greenway and Wildcat Creek Regional Trail....

Action PR1.K Inter-Agency Collaboration: Collaborate with the East Bay Regional Park District (EBRPD), California Department of Parks and Recreation (DPR), University of California and the National Park Service (NPS) to ensure coordinated management of Richmond's many parks and trails....

Action PR3.A Sustainability Guidelines for Parks and Recreation Facilities: ...Key components of Richmond's parks and open space system should include...using green streets and multi-use trails to link open spaces...[and] [r]etrofitting streets to be bicycle and pedestrian-friendly and developing multi-use trails to encourage non-vehicular modes of transit.

Action PR4.C Bay Trail and Shoreline Access Ordinance: Develop and adopt an ordinance that requires future developments near the shoreline to provide public access where the San Francisco Bay Trail is planned and to provide public access to the shoreline where feasible.

Community Health and Wellness Element (Element 11)



Policy HW1.1 An Integrated System of Parks, Plazas, Playgrounds and Open Space: Provide a comprehensive and integrated system of parks, plazas, playgrounds, trails and open space....The City should ensure adequate maintenance of these facilities to encourage safe and active use.

Action HW1.D Parks Maintenance Plan: Update the maintenance plan for all City-owned and operated parks, trails, landscapes

and greenways. Include funding mechanisms to support ongoing operations and life-cycle replacements....

Policy HW4.3 Safe and Convenient Walking and Bicycling: Promote walking and bicycling as a safe and convenient mode of transportation. Continue to improve pedestrian and bicycle amenities to serve the recreation and travel needs of residents and visitors in all parts of Richmond. Where feasible, the City should: connect major destinations such as parks, open spaces, civic facilities, employment centers and retail and recreation areas with pedestrian and bicycle infrastructure; promote shared roadways in residential streets; require new development and redevelopment projects to provide pedestrian and bicycle amenities, streetscape improvements and linkages to planned and completed City and regional multi-use trails; and develop safe routes to schools and out-of-school programs that allow access by bicycle and pedestrian paths or reliable and safe transit. Support construction of provide enhanced bicycle and pedestrian facilities, explore innovative solutions such as bicycle-sharing programs, encourage businesses, schools and residential developments to provide secure bicycle parking.

Policy HW8.1 Investment in Public Facilities: Prioritize public investment and improvements for public facilities and amenities that provide significant social, economic and community benefits in underserved neighborhoods...[including] streetscape improvements such as pedestrian-scale lighting, safe pedestrian and bicycle routes, landscaping and traffic calming....

National Historical Park Element (Element 15; refers to the Rosie the Riveter/World War II Home Front National Historical Park)

Policy NP1.2 Access to Resources: Support the expansion of transportation options to National Historical Park resources and

sites in the City. Prioritize access by public transit, bicycling and walking....

► www.cityofrichmondgeneralplan.org

Municipal Code

The Richmond Municipal Code contains all the City's ordinances. The code is organized into three tiers, beginning with article (or title), then chapter and ending with section. An article is a broad category under which ordinances on a related subject are compiled. Chapters deal with more specific subjects and are often derived from a single ordinance; all of the chapters on a related subject are grouped under one title. Lastly, sections contain substantive ordinance material. The Municipal Code is slated to be updated following adoption of the updated General Plan.

Most of the sections in the Richmond Municipal Code related to bicycling are found in Chapter 7.12 and articles XIV and XV (see below). In addition, Chapter 12.28 contains provisions on the construction, maintenance, excavation and inspection of streets in general and of sidewalks, while Section 11.08.010, under the "Public Safety and Welfare" article, prohibits "any person to ride a bicycle, motorcycle or motor scooter in city parks, playgrounds and playlots."

Chapter 7.12, Bicycles and Bicycle Establishments, generally deals with the licensing of bicycles and the regulation of certain bicycling-related businesses. The chapter forbids "any resident of the city to operate or use a bicycle within the city unless such bicycle has been licensed and is equipped as provided in this chapter" (§7.12.020) and contains additional provisions on bicycle licensing and registration (§7.12.030–100). Sections 7.12.120–290 outline the requirements for businesses "wherein used bicycles or bicycle parts are purchased, sold, exchanged, bartered, repaired, remodeled, dismantled or junked." Section 7.12.110 lists the rules of the road for bicyclists.

Article XIV, "Traffic," regulates vehicular and pedestrian traffic in the City. It contains the following bicycle-related provisions:

- 14.08.020 Traffic accident reports:** The Police Department shall maintain a suitable system of filing traffic accident reports. Accident reports or cards referring to them shall be filed alphabetically by location. Such reports shall be available for the use and information of the Director of Public Works.
- 14.08.030 Police department to submit annual traffic safety report:** The Police Department shall annually prepare a traffic report which shall be filed with the City Council. Such report shall contain information on traffic matters in the City as follows:
 1. The number of traffic accidents, the number of persons killed, the number of persons injured, and other pertinent traffic accident data;
 2. The number of traffic accidents investigated and other pertinent data on the safety activities of the police;
 3. The plans and recommendations of the division for future traffic safety activities.
- 14.12.050 Traffic regulations apply to persons riding bicycles or animals:** Every person riding a bicycle or riding or driving an animal upon a highway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle....
- 14.32.070 Restrictions on use of freeways:** No person shall drive or operate any bicycle, motor driven cycle, or any vehicle which is not drawn by a motor vehicle upon any street established as a freeway, as defined by State law....
- 14.44.090 Bicycle or motor scooter parking zones:** (a) When the Director of Public Works determines that the establishment of bicycle or motor scooter parking zones is necessary or desirable for the regulation of traffic, or to provide facilities for the temporary parking of bicycles or motor scooters being operated upon the public streets...he is authorized to set aside a space

on the street not more than thirty-six feet in length for the parking of bicycles or motor scooters

Article XV, “Zoning and Subdivisions,” contains the City’s zoning and subdivision ordinances. Section 15.08.410 enables the City to require a subdivider, as appropriate, “to dedicate such additional land as may be necessary and feasible to provide bicycle paths...if the subdivision...contains two hundred or more parcels.” Section 15.08.550 requires that developer-provided bicycle paths “consist of asphalt surfacing with a minimum width of ten feet and a minimum thickness of one and one-half inches within a minimum right-of-way of sixteen feet” and have a maximum grade of ten percent. Chapter 15.12 specifies the transportation improvements that can be funded through trip-impact mitigation fees raised from new development under the West County Subregional Transportation Mitigation Program. Fundable bicycle projects include improvements at or near the I-80/San Pablo Dam Road interchange; storage at the El Cerrito Plaza, El Cerrito Del Norte and Richmond BART stations; and access improvements at the “Del Norte Area Transit Oriented Development Project.” Lastly, Section 15.04.520.070, which establishes a “Special Features Overlay District” for the Point San Pablo Peninsula area, requires “[a]dequate provision...for automobile and bicycle parking at or near shoreline access points.”

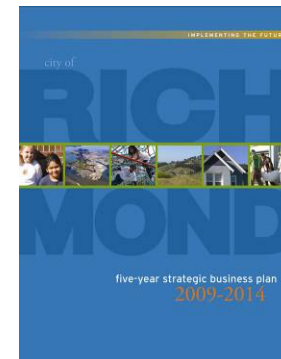
► www.municode.com/Library/clientCodePage.aspx?clientId=11684

Pedestrian Plan

The City is in the process of developing a plan to make Richmond a safer, more appealing place to walk. The Pedestrian Plan will provide direction on creating streets, sidewalks and surroundings that “calm” traffic, improve the comfort and mobility for people of all ages and abilities, and provide a positive environment for interaction and community pride. Pedestrian-friendly design solutions will be explored in locations where there have been collisions involving

pedestrians, and focus on “change areas” in the new General Plan, which present opportunities for revitalization. So that the plan can be applied citywide, special attention will be given to characteristics and challenges that appear in places throughout Richmond, such as the grid street and block pattern prevalent in many neighborhoods; railroad tracks and crossings; corridors that change from residential to commercial and industrial development; dead-end locations; and freeway on and off ramps and overpasses.

Five-Year Strategic Business Plan 2009-2014



The Strategic Business Plan (SBP) is one of the key tools for implementing the City’s updated General Plan. The 2009–2014 SBP outlines the strategies, projects and programs that will support phased implementation of the General Plan over its first five-year period. The SBP guides development of the City’s Capital Improvement Plan and operating budget, which are then used to prioritize the City’s projects and programs on an annual basis.

The SBP is guided by five goals: maintain and enhance the physical environment; promote a safe and secure community; promote economic vitality; promote sustainable communities; and promote effective government. Each goal is underpinned by a set of objectives and each objective by a set of supporting actions. The SBP has a number of bicycle-related objectives and supporting actions, including to implement the Bicycle Master Plan (objective 1.3.e):

Goal 1: Maintain and enhance the physical environment

Objective 1.1: Increase the existing Paving Condition Index

Objective 1.2: Improve the street lighting system

Objective 1.3: Make Richmond more pedestrian- and bicycle-friendly

- 1.3.a Conduct a citywide sidewalk survey
- 1.3.b Increase collaboration with the school district to jointly fund improvements on safe routes to schools
- 1.3.c Rehabilitate concrete sidewalks, curbs and gutters for ADA compliance and safety
- 1.3.d Rehabilitate pedestrian paths in parks
- 1.3.e Implement the Bicycle and Pedestrian master plans
- 1.3.f Create connection between the Richmond Greenway Phase 2 and the Ohlone Pathway
- 1.3.g Connect and increase the number of “off-street” bicycle trails
- 1.3.h Complete the San Francisco Bay Trail in Richmond
- 1.3.i Establish an ordinance that requires utilities to remove obstructions in the public rights of way

Goal ②: Promote a safe and secure community

Objective 2.7: Enhance recreational facilities, programs and activities

- 2.7.b Upgrade and improve physical conditions of current recreation facilities
- 2.7.e Provide sustainable city activities which promote health, fitness and an appreciation of our environment

Objective 2.9: Improve traffic and pedestrian safety

- 2.9.a Revise traffic-calming standards
- 2.9.b Revise crosswalk standards
- 2.9.c Review and prioritize improvements to at-grade railroad crossings
- 2.9.d Inspect all traffic signals regularly

Goal ④: Promote sustainable communities

Objective 4.2: Promote and support the creation of healthy town centers and neighborhoods

- 4.2.a Complete the community design and implement the construction of 23rd Street streetscape improvements
- 4.2.d Upgrade streetlight aesthetics and illumination in two neighborhoods
- 4.2.e Revise City street and sidewalk standards

- www.ci.richmond.ca.us/index.aspx?NID=1785

Richmond Community Redevelopment Agency Five-Year Implementation Plan (FY2009/10-2013/14)

The Richmond Community Redevelopment Agency's (RCRA) Implementation Plan outlines the agency's proposed program of revitalization, economic development and affordable housing activities. The Redevelopment Program for the five years covered in the latest plan includes several bicycle-related items:

- Assist City departments with the implementation of pedestrian and bi-cycle safety programs, including street and sidewalk improvements, traffic calming projects. and expansion of, or improvement to, the local bicycle network.
- Set forth policies in partnership with other public agencies to provide open space in the community and improve programs at existing facilities. Potential improvements include community access to the waterfront and assistance in completing the Bay Trail and Point San Pablo Shoreline.
- Assist with the landscaping and creation of trails on City right-of-ways adjacent to railroad tracks and on former railroad rights-of-way, such as the Richmond Greenway.
- Assist City departments with the implementation of pedestrian and bi-cycle safety programs, including street and sidewalk improvements, traffic calming projects. and expansion of, or improvement to, the local bicycle network.

- <http://sireweb.ci.richmond.ca.us/sirepub/cache/2/03vbuf453lpkfo45wl32i44517016009172010021541325.PDF>

Streetscape and Trail Projects

In the last two years, the City of Richmond and RCRA have undertaken a number of streetscape and trail plans and projects, which, when fully implemented, promise to improve conditions for both pedestrians and bicyclists considerably. The most significant of these plans and projects are summarized below.

23rd Street Streetscape Improvements: In 2008, RCRA initiated a process to revitalize the 23rd Street commercial district from Bissell Avenue at the south to Costa Avenue at the north. The street functions as a north-south arterial connection for Central Richmond and San Pablo to Interstate 580 and the Marina Bay area of South Richmond. The emphasis of the revitalization plan is on a comprehensive streetscape improvement initiative that will reduce the number of travel lanes and widen the sidewalks; convert the street to two-way traffic and add sharrows; shorten crossing distances for pedestrians; and enhance community character through improved lighting and landscaping, and new community-gathering spaces.



Nevin Avenue Streetscape Improvements: More recently, in 2009, RCRA also began a process to improve pedestrian conditions on Nevin Avenue, a primarily residential corridor linking the Richmond Transit Village and Intermodal Transit Station with the recently

renovated Richmond Civic Center. The project area is approximately one-half mile long, extending from the Transit Station in the west to 27th Street in the east. The project's focus will be on improving the aesthetics and safety of the street as a bicycle boulevard through redesigned intersections with enhanced crosswalks, new curb and gutter, curb ramps to meet disabled-access requirements, pedestrian-scale lighting, enhanced landscaping, wayfinding signage and traffic-calming measures. The improvements are designed to complement similar projects along 23rd Street (see above) and Macdonald Avenue (see below).

Macdonald Avenue Streetscape Improvements: As part of RCRA's efforts to recast downtown Richmond as a vibrant, pedestrian-friendly "urban village," the agency is also implementing streetscape improvements on Macdonald Avenue. The first phase of the project targeted Macdonald from San Pablo Avenue to 39th Street and involved straightening the street; installing sidewalk bulb-outs, enhanced crosswalks and improved street lighting; and planting more than 130 street trees. The second phase, completed in 2009, extends from Harbour Way to 19th Street; it involves the installation of new street lights, landscaping, sidewalks, angled parking, street furniture and public art. Design documents have been completed for remaining segments but construction is pending identification of funds.



Bay Trail improvements: As mentioned later in this chapter, Richmond has more miles of completed Bay Trail alignment than any other city. Highlights from 2009 in the development of the local Bay Trail include opening of a trail link at Ford Point, installation of bike lanes or

bike routes on Hall Avenue between Marina Way South and Harbour Way South, and on Harbour Way South between Hall Avenue and Wright Avenue (accomplishments of RCRA); publication of a guide of the Ferry Point Loop Trail (by the Trails for Richmond Action Committee [TRAC], a local advocacy organization); donation by Chevron of a 1.5-mile easement on its refinery property for a trail between Interstate 580 and Point San Pablo; and launch of a \$1.6 million design project to connect Point Richmond and the Richmond–San Rafael Bridge. At least 5 miles of Bay Trail segments are expected to be completed by Spring 2011, including through Kaiser Shipyard 3, from Kaiser Shipyard 3 to Ferry Point, between Wildcat Creek and the former West County Landfill, and a 3-mile loop through the former landfill.



Richmond Greenway to Ohlone Greenway Connection: The Richmond Greenway (in central Richmond) and the Ohlone Greenway (in El Cerrito) end at roughly the same spot, off Key Boulevard in El Cerrito. These trails will be connected by way of a new signalized bicycle/pedestrian crossing at San Pablo Avenue and a new bicycle/pedestrian bridge over the confluence of the middle and south forks of Baxter Creek. This connection will improve access to

several BART stations and transit corridors, and provide regional connectivity between the San Francisco Bay Trail and the cities of Richmond, El Cerrito, Albany and Berkeley.

OTHER CITIES' AND COUNTY PLANS

El Cerrito Circulation Plan for Bicyclists and Pedestrians

The City of El Cerrito adopted this plan in 2007 as its bicycle and pedestrian master plan. The plan provides an overview of the city and of related plans, projects and policies; describes existing conditions, including facilities and demand estimates for bicycling and walking; identifies goals; designates a bikeway network and recommends specific route, bicycle detection, parking and wayfinding signage improvements; designates pedestrian routes and describes recommended route and intersection improvement projects; identifies “major activity centers” and other priority areas for improvement; contains facility design guidelines; describes recommended support programs; includes project prioritization and implementation strategies; and identifies funding opportunities.

The map of existing and proposed bikeways is on page 31 of the El Cerrito plan (Figure 14). The bikeways that connect to Richmond are the Ohlone Greenway (Class I); San Pablo Avenue, Potrero Avenue, Moeser Lane and Carlson Boulevard (Class II); and Rifle Range Road (into Wildcat Canyon Regional Park), Arlington Boulevard, Barrett Avenue, Key Boulevard, Manila Avenue, Schmidt Lane, Portola Drive, Waldo Avenue, Stockton Avenue, Lincoln Avenue and Lassen Street–Belmont Avenue (Class III). Of these bikeways, the only existing ones as of the date of adoption of the El Cerrito plan were the Ohlone Greenway and the Lassen Street–Belmont Avenue bike lanes.

► www.el-cerrito.org/public_works/pdf/CirculationPlan_adopted.pdf

Contra Costa Countywide Bicycle and Pedestrian Plan

The Contra Costa Transportation Authority updated its Countywide Bicycle and Pedestrian Plan in 2009. The plan describes existing conditions (namely the county's physical landscape, commute statistics and collision data); summarizes related planning efforts; establishes goals and policies; and reaffirms the countywide bikeway network designated in the previous countywide plan. The main existing and proposed segments of the countywide bikeway network in and near Richmond are Central Avenue, Carlson Boulevard, San Pablo Avenue, the Richmond and Ohlone greenways, Cutting Boulevard, Marina Way, Harbour Way, Wright Avenue, Hoffman Boulevard, Canal Boulevard, Ohio Avenue, Barrett Avenue, Garrard



Boulevard, Richmond Parkway, 20th Street, Market Avenue, Church Lane, El Portal Drive, Key Boulevard, Amador Street, San Pablo Dam Road, Hilltop Drive, Blume Drive, Fitzgerald Drive and Appian Avenue. The countywide bikeway network also encompasses much of the San Francisco Bay Trail (see below).

The plan also contains a list of implementation actions and establishes prioritization criteria to be used by the CCTA when awarding funds for bicycle, pedestrian and trail projects. The main purpose of the plan, however, is to provide tools for cities and other local agencies in Contra Costa on implementing bicycle and pedestrian projects. Accordingly, the plan outlines the main types of pedestrian and bicycle facilities and support programs that local jurisdictions can implement; provides online tools and resources on the planning and design of facilities and also of

pedestrian- and bicycle-friendly developments; outlines requirements for sponsors of transportation projects under MTC's complete streets/routine accommodation policy (see below); provides guidance on the application of the Americans with Disabilities Act to public rights-of-way; summarizes the main funding programs for bicycle and pedestrian projects and programs; and describes how cities can use the countywide plan to become eligible for funds from Caltrans' Bicycle Transportation Account.

► www.ccta.net/EN/main/bike/cbpp.html

REGIONAL PLANS

San Francisco Bay Trail

The Bay Trail is a planned continuous multi-use trail that, when complete, will encircle San Francisco and San Pablo bays. Approximately 500 miles long, the trail's planned alignment connects the shoreline of all nine Bay Area counties, links 47 cities and crosses all the toll bridges in the region. The alignment includes a continuous "spine" along or near the shoreline and many short "spurs" to the waterfront itself. Planning for the Bay Trail is coordinated by the nonprofit San Francisco Bay Trail Project, a project of the Association of Bay Area Governments.



To date, over 300 miles of the Bay Trail alignment have been developed as either off-street paths or on-street bicycle lanes or routes. Richmond has over 30 miles of completed Bay Trail, the most of any city. Completed segments—including off- and on-street—of significant length exist through Point Isabel Regional Shoreline, Eastshore State Park, Marina Bay, Miller-Knox Regional Shoreline, West County Landfill and Point Pinole Regional Shoreline and on Regatta Boulevard, Marina Way, Harbour Way,

Cutting Boulevard, Canal Boulevard, Seacliff Drive, Garrard Boulevard, the West County Landfill loop, Richmond Parkway and Atlas Road. On the other hand, almost 11 miles of Bay Trail gaps remain in Richmond; significant missing lengths are found between Kaiser Shipyard 3 and Ferry Point, from Point Richmond to the Richmond–San Rafael Bridge toll plaza, from the toll plaza to Point San Pablo Yacht Harbour and from Goodrick Avenue to Point Pinole Regional Shoreline. Chevron’s Long Wharf presents another significant obstacle to completing the Bay Trail through Richmond.

- www.baytrail.org (San Francisco Bay Trail Project);
- www.baytrail.org/maps/Carquinez_Strait.pdf (Bay Trail Project map covering Richmond)

Regional Bicycle Plan for the San Francisco Bay Area

In 2009, the Metropolitan Transportation Commission (MTC)—the regional transportation planning agency for the Bay Area—updated its Regional Bicycle Plan for the San Francisco Bay Area. The new plan updates the designated regional bikeway network, one of the purposes of which is to focus MTC’s spending on high-priority facilities that serve regional trips. The regional bikeway network extends approximately 2,140 miles and the estimated cost to complete it is just over \$1.4 billion, approximately half of which is for toll bridges that currently lack bicycle access.

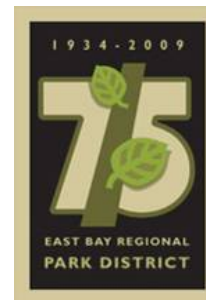
The MTC plan breaks down the length and completion cost of the regional bikeway network by county, though not by city. The network includes 319 miles in Contra Costa County, of which 181 miles (almost 60 percent) have been built or are fully funded and awaiting development. The plan estimates the cost to complete the bikeway network within Contra Costa, excluding the toll bridges, at almost \$26 million. A map of the Contra Costa portion of the regional bikeway network is shown on page 35 of the MTC plan. In and near Richmond, the existing and proposed network encompasses much of the San

Francisco Bay Trail (see above), the Richmond and Ohlone greenways, Barrett Avenue, San Pablo Avenue, Appian Way, Atlas Road, Wildcat Creek Trail and San Pablo Dam Road.

- www.mtc.ca.gov/planning/bicyclespedestrians/MTC_Regional_Bicycle_Plan_Update_FINAL.pdf

East Bay Regional Park District Master Plan

The East Bay Regional Park District (EBRPD) serves as a regional park agency for Contra Costa and Alameda counties, acquiring, developing, managing and maintaining parkland. It encompasses more than 98,000 acres, with 65 parks and over 1,100 miles of mostly unpaved trails. The trails are designed to connect parks and communities and use publicly owned rights-of-way in cooperation with other agencies, with the goal of developing a regional trail network that provides nonmotorized transportation and recreational opportunities.



EBRPD’s most recent master plan was adopted in 1997. Trails-related priorities in the plan include completing the missing sections of the San Francisco Bay Trail (see above) and Bay Area Ridge Trail, and developing key trail segments in eastern Alameda and Contra Costa counties. The district hopes to begin updating its master plan in 2010. In the meantime, it updated the master plan map in 2007, showing all existing and potential parklands and trails in its system, including 84 trail gap segments needed to complete the district’s trail network. In and near Richmond, EBRPD’s network of existing and potential trails encompasses much of the San Francisco Bay Trail (see above), the Richmond and Ohlone greenways, Wildcat Creek Trail, and the East Bay Skyline National Recreation Trail through Wildcat Canyon Regional Park.

► www.ebparks.org/planning/mp

MTC's Complete Streets/Routine Accommodation Policy

"Routine accommodation" refers to the practice of considering the needs of pedestrians and bicyclists habitually in the planning, design, funding and construction of transportation projects. "Complete streets" is a related concept that describes roadways designed and operated for safe and convenient access by all users, including bicyclists, pedestrians and transit riders.



In June 2006, the Metropolitan Transportation Commission (MTC) adopted a complete streets/routine accommodation policy for the region. The policy states that projects funded all or in part with regional funds "shall consider the accommodation of bicycle and pedestrian facilities, as described in Caltrans Deputy Directive 64" (see below) in the full project cost. The policy requires that sponsors of transportation projects—which could include the City of Richmond—complete a project checklist for any project submitted for funding to MTC that has the potential to impact bicycle or pedestrian use negatively. The checklist is meant to ensure that project sponsors evaluate the need for bicycle and pedestrian facilities as part of project planning—ideally at the earliest stage—and accommodate such facilities in the design and budget of their projects.

► www.mtc.ca.gov/planning/bicyclespedestrians/routine_accommodations.htm

STATE PLANS

Caltrans' Complete Streets Policy

In 2001, the California Department of Transportation (Caltrans) adopted a routine accommodation policy for the state in the form of Deputy Directive 64, "Accommodating Nonmotorized Travel." The directive was updated in 2008 as "Complete Streets—Integrating the Transportation System." The new policy reads in part:

The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.

The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations....

The directive establishes Caltrans' own responsibilities under this policy. Among the responsibilities that Caltrans assigns to various staff positions under the policy are:

- Ensure bicycle, pedestrian, and transit interests are appropriately represented on interdisciplinary planning and project delivery development teams.
- Ensure bicycle, pedestrian, and transit user needs are addressed and deficiencies identified during system and corridor planning, project initiation, scoping, and programming.
- Ensure incorporation of bicycle, pedestrian, and transit travel elements in all Department transportation plans and studies.

- Promote land uses that encourage bicycle, pedestrian, and transit travel.
- Research, develop, and implement multimodal performance measures.

► http://www.calbike.org/pdfs/Caltrans_DD-64.pdf

California Complete Streets Act

Assembly Bill 1358, the “California Complete Streets Act of 2008,” requires “that the legislative body of a city or county, upon any substantive revision of the circulation element of the general plan, modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users [including] motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation....” This provision of the law goes into effect on January 1, 2011. The law also directs the Governor’s Office of Planning and Research to amend its guidelines for the development of circulation elements so as to assist cities and counties in meeting the above requirement.

► leginfo.ca.gov/pub/07-08/bill/asm/ab_1351-1400/ab_1358_bill_20080930_chaptered.html

3 . Policy Framework

This chapter lays out the policy framework for the Richmond BMP. The framework begins with a long-range vision for bicycling in Richmond, followed by a set of four overarching goals. Each goal is accompanied by an objective designed to gauge progress in achieving the goals. Goals are typically implemented through policies and actions dealing with more specific issues. Instead of formulating new, separate policies and actions, the BMP incorporates the bicycling-related ones that were developed recently during the update of the city's General Plan. Lastly, subsequent chapters of the BMP include recommendations, implementation tasks and next steps that are even more specific.

VISION STATEMENT

The policy framework begins with an overarching vision statement, which expresses what bicycling will be like in Richmond in the future

if the City successfully implements the BMP. The vision statement for the BMP is:

Richmond will have an extensive and well-connected system of bicycle routes and parking facilities that provide easy access to jobs, homes, schools, transit, the shoreline, county and regional bikeways, and other key destinations throughout the city and surrounding areas. A variety of programs, incentives and activities will promote bicycling among Richmond's diverse communities. The city government will accommodate the needs and concerns of bicyclists when planning, designing, building and maintaining all transportation projects and when reviewing and approving all development projects. Thanks to these improvements, bicycling in Richmond will be much safer, more convenient and more pleasant than it is today. As bicycling becomes a mainstream activity and a dignified way to get around the city, many more people of all ages who live, work, go

to school, shop and play in Richmond will bicycle for transportation and recreation. This will contribute to the health, well-being and environmental sustainability of the community and make Richmond a regional bicycling destination and hub.

GOALS

The BMP contains a set of four goals. These are broad ends or statements of purpose, each dealing with a separate topic, designed to support implementation of the long-term vision for bicycling in Richmond over the next 5-10 years. The goals set the overall directions and provide guidance on the general subject areas in which the City should concentrate its efforts related to bicycling.

Goal ①: Expand the city's bicycle routes and parking facilities into an extensive, well-connected and well-designed network, and improve and maintain these facilities over time.

Objective: Increase the number of bikeway miles by 75 percent, complete all gaps in the Bay Trail and double the number of bicycle parking spaces.

Goal ②: Increase the number of people of all ages and backgrounds who bicycle for transportation, recreation and health.

Objective: Double the number of trips made by bicycle.

Goal ③: Make the streets safer for bicyclists, not only during the day but also at night.

Objective: Reduce the number of bicycle fatalities and injuries by 25 percent (even as the number of bicyclists increases).

Goal ④: Incorporate the needs and concerns of cyclists in all transportation and development projects.

Objective: Adopt, institutionalize and have relevant City departments implement a "Complete Streets" policy and bicycle-friendly design standards and guidelines for streets and developments.



Photo credit: Adrienne Harris

POLICIES AND ACTIONS

Policies and actions are more specific and detailed statements meant to support and help implement the goals. The residents of Richmond have developed numerous bicycling-related policies and actions through the process of updating the city's General Plan. The Plan, entitled "Shaping the New 100 Years," was prepared beginning in [date?] and was adopted in [date?]. Most of the bicycling-related policies and actions appear in the Plan's Circulation Element, with additional ones scattered throughout other elements. These policies and actions have been reproduced in Chapter 2, "Related Plans."

Because the General Plan was developed recently and benefitted from an extensive public-outreach process, and contains a comprehensive set of bicycle related policies and actions, the BMP therefore incorporates, by reference, the bicycling-related policies and actions from the General Plan rather than establish entirely new, separate ones. Nonetheless, because the General Plan left some issues unaddressed, below are suggested additional policies for the City to consider:

- ❑ Set aside a small amount of funding from each year's capital improvement budget that could serve as local matching funds for grant-funded projects that implement the BMP.
- ❑ Develop a coordination mechanism with the City's five-year street pavement plan so that appropriate bicycle striping projects outlined in the BMP are installed as part of paving projects.
- ❑ Develop guidelines for the City's review of projects under the California Environmental Quality Act that recognize the environmental benefits of bicycle facilities and facilitate their implementation.
- ❑ To the extent possible, coordinate implementation of projects, programs and policies from the Bicycle Master Plan with those from the City's Pedestrian Plan.
- ❑ Eliminate requirements for bicycle licensing and registration in the City's Municipal Code.
- ❑ Restrict the use of motorized vehicles on the Bay Trail (with the exception of emergency vehicles and electric wheelchairs).
- ❑ Have City staff develop annual implementation work plans for the BMP and reports on implementation progress, and ensure that RBPAC members and elected and appointed officials review these documents annually.

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4 . Background Conditions

This chapter addresses BTA requirement (a): The estimated number of existing bicycle commuters in the plan area and the estimated increase in the number of bicycle commuters resulting from implementation of the plan; and (b): "A map and description of existing and proposed land use and settlement patterns which shall include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, and major employment centers."

LAND USE AND SETTLEMENT PATTERNS

The city of Richmond is located on the western edge of Contra Costa County. It was incorporated in 1905 and has a population of approximately 104,000 and a land area of 30.4 square miles, making it the second largest city in Contra Costa on both counts. Like much of the

rest of the Bay Area, Richmond has Mediterranean climate with mild year round temperatures and rain free summers.

The City's land area is essentially divided into three sections, with its northern portions separated from central and south Richmond by the City of San Pablo and a relatively large pocket of unincorporated Contra Costa County. A third portion is located in the El Sobrante Valley on the inland side of the coastal hill range to the east. This eastern portion is mostly hilly while the other two portions are generally flat, with the exception of Point Richmond and the San Pablo peninsula, the Hilltop district in the north and portions of the Richmond Annex (south). San Pablo and San Francisco Bays surround Richmond along the northwest, west and south, giving it the longest shoreline of any city in the Bay Area.

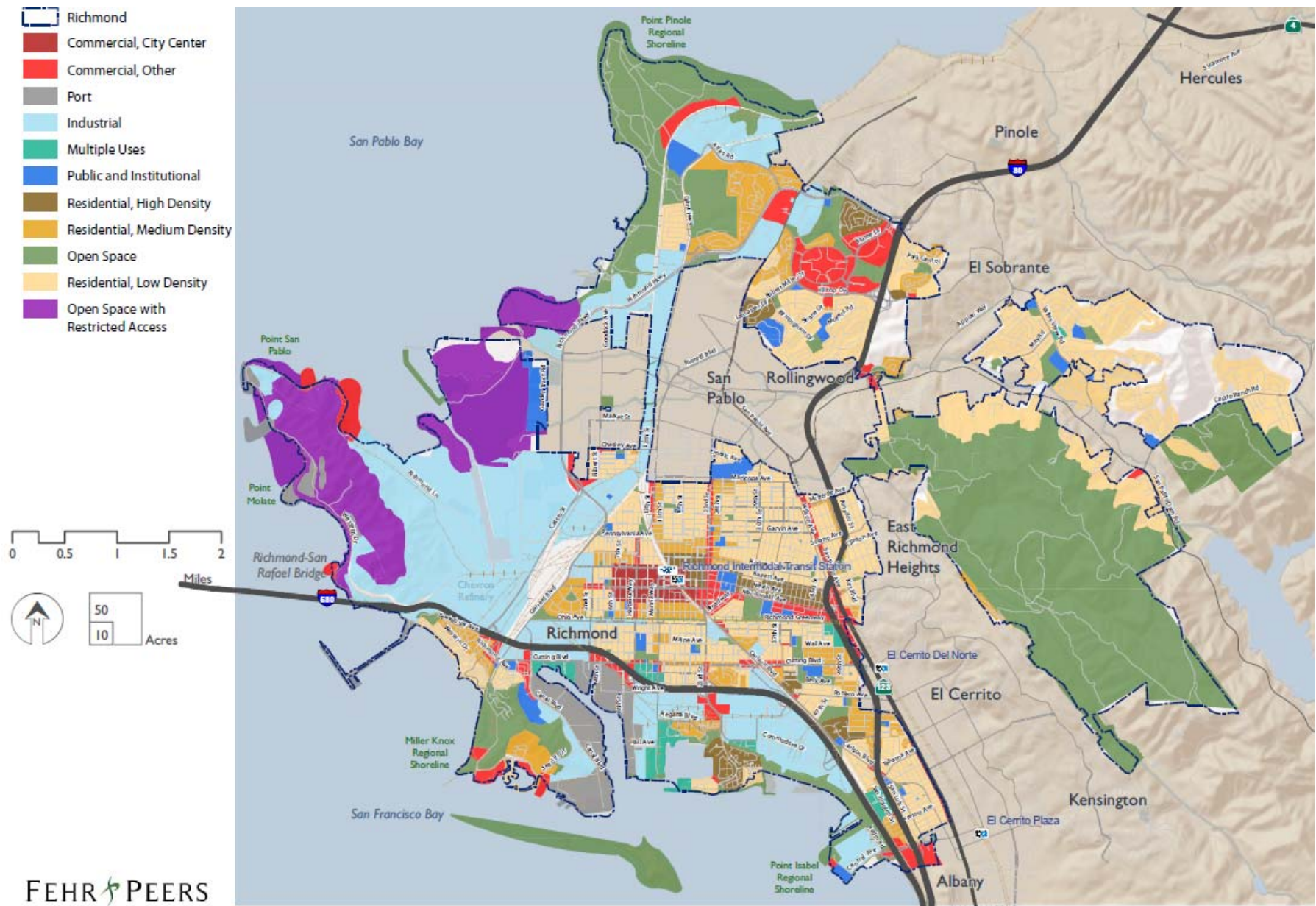
Richmond encompasses approximately 18,800 acres (see next page for the map of Richmond land use designations, from the City's General Plan). The largest component by land use is parks and open space, which make up 5,900 acres, or 31 percent of the total; however, the vast majority of this acreage is private, otherwise inaccessible to the public or does not border residential areas of Richmond. This is followed by residential neighborhoods (4,600 acres; 24 percent), industrial and port activities (4,100 acres; 22 percent), commercial uses (900 acres; 5 percent) and a variety of other uses. The open space and park lands are primarily found on the city's periphery; these include the Point Pinole, Point San Pablo, Point Molate, Miller-Knox and Point Isabel shorelines; the Rosie the Riveter/World War II Home Front National Historical Park, also on the shoreline; and, along the city's eastern edge, Wildcat Canyon and Sobrante Ridge. Smaller, urban parks are scattered throughout the city. The 2,430-acre Wildcat Canyon Regional Park, which extends to the Tilden Nature Area in Berkeley, accounts for more than half of the 4,287 acres of park land in Richmond; however, it is bordered by residential areas of Berkeley, Kensington, El Cerrito, San Pablo and unincorporated Contra Costa County, rather than those of Richmond.

The residential areas are concentrated in the City's central and southern portion with smaller but significant clusters in North Richmond, Parchester Village the Hilltop district and the El Sobrante Valley. Owing to Richmond's history as a seaport, industrial activities are clustered along the waterfront west of Garrard and south of I-580 or near rail lines in north Richmond. The main commercial areas are the City's downtown, Hilltop district and a regional-serving retail district near Point Isabel; smaller, local-serving retail districts are scattered throughout. Major employment centers include the Downtown, the port area, the Hilltop district and Chevron's Point Molate facility (Chevron is by far the city's largest employer).

There is a concentration of public buildings in the Downtown's civic center, including City Hall, Memorial Auditorium, Convention Center, main branch of the Richmond Public Library, and the Richmond Art Center. There are 44 public schools scattered throughout the city, including 28 elementary schools, eight middle schools, five high schools and three specialty schools.

In terms of development patterns, Richmond can be categorized into pre- and post-World War II areas. The City's southern portion was mostly developed in the first half of the 20th Century. This section of the City tends to feature the urban forms and patterns of that era: short blocks set on a grid, narrower streets, frequent intersections, mixture of land uses, moderately high development densities and small footprint buildings with sidewalks on nearly every block—all factors that contribute to bicycling (and walking). Following World War II, development spread to the city's northern and eastern parts. Development forms and patterns found in these more recently developed areas include wide, non-linear streets, long blocks, infrequent intersections and crossing points and segregated land uses with low development densities.

Map 4-1 | Land Uses in Richmond



UNIQUE OPPORTUNITIES FOR BICYCLING IN RICHMOND

The urban fabric of Richmond is distinctive. It faces many challenges with respect to being divided by freeways, railroads and major industrial sites, as well as high crime rates that affect people's sense of personal safety in public places. However, these challenges, along with a host of incredible opportunities, make Richmond a place that could experience dramatic change when these obstacles are overcome. Furthermore, there is considerable reason to believe that Richmond is ripe for change.

Good walking and bicycling bones

The City was originally developed around pedestrian travel and the streetcar, and continues to be a transit rich, transit oriented community today. Central Richmond has a uniform grid of small blocks and a good mix of land uses including diverse commercial streets well distributed throughout the City. The intermodal transit station in downtown Richmond provides convenient access to destinations throughout the Bay Area via AC Transit and BART, as well as destinations throughout the U.S. via Amtrak. The diversity and density of land uses, combined with excellent transit service provides the ideal environment for a thriving bicycle-friendly community.

Funding eligibility

From climate change initiatives to safe routes to school programs, there are multiple funding sources on both the regional and state level that are appropriate for Richmond. In addition, the City stands to benefit from the new Federal focus on healthy communities. Details on these funding opportunities are described in Chapter 10: Funding and Implementation. However, a key constraint for implementing future

projects is the City's limited capacity for project management and delivery. A dedicated, full-time staff position to coordinate pedestrian and bicycle projects will be instrumental in the successful implementation of this plan and the forthcoming Pedestrian Master Plan.

Underused rights of way

Historically, an expansive arterial road network was developed to support Richmond's major employers at the shipyards. As the Bay Area developed, several major freeways including I-80, I-580 and the Richmond Parkway were developed on top of the existing roadway network. As employment shrunk considerably since that time, the City now has many overly wide and redundant connector streets such as Cutting Boulevard, Harbour Way, Marina Bay Parkway, Barrett Avenue, and Carlson Boulevard. This excessive right of way provides many immediate opportunities to enhance the bicycle and pedestrian realm by expanding sidewalks, installing bike lanes and creating inviting public spaces along community activity and connector streets.

As noted, Richmond has the longest and most scenic section of the Bay Trail and is blessed with more shoreline than any other city in the Bay Area. As such, the City has the potential to be a magnet for people seeking healthy lifestyles, particularly as the City's bicycle network develops.

BICYCLE RIDERSHIP

Means of Transportation

Knowing how many people bicycle, and for what purposes can help the City develop projects and programs to better serve current and future cyclists. The next table shows the means of transportation used by workers 16 years and older in Richmond to commute from home to work, according to the latest U.S. Census (2000). For context and purposes of comparison, the table also shows this information for Contra Costa County, the nine-county Bay Area, California and the United States. The table shows that bicycling accounts for 0.6 of commute trips among Richmond workers; this is a higher share than for the county and U.S. but lower than for the Bay Area as a whole and the state at large. Drive-alone is the predominant means of commuting in Richmond but commands a significantly lower share than at the county, regional, state and national levels. Conversely, carpooling and public transportation are more common ways to commute in Richmond than elsewhere.

Bicycle Commuting in Richmond

Two hundred thirty-nine (or 0.6%) of the 41,745 workers in Richmond counted in the 2000 Census bicycled to work. Since this information is 10 years old, it is possible that the figure has changed. Bicycle commuters also include people who bike to school and those who bike to transit before continuing to work. More recent data for these two commuter categories can be extrapolated from the American Community Survey [ACS], a project of the Census Bureau which collects information every year instead of every 10 years but does not break out bicycling as a separate commute mode.

Table 4-1 | Home-to-work means of transportation
(%; 2000 U.S. Census)

	<i>Richmond</i>	<i>Contra Costa County</i>	<i>Bay Area</i>	<i>California</i>	<i>U.S.</i>
Drive-alone	59.3	70.2	68.0	71.8	75.7
Carpool	19.6	13.5	12.9	14.5	12.2
Public transportation	14.5	9.0	9.7	5.1	4.7
Bicycle	0.6	0.5	1.1	0.8	0.4
Walk	1.9	1.5	3.2	2.9	2.9
Other ¹	4.3	5.4	5.1	4.8	4.1

¹ Includes work-at-home, motorcycle and taxicab

Below are estimates of bicycle ridership among these two later groups, followed by a table summarizing the total estimated daily number of bicycle commuters in Richmond.

- **Students biking to school:** According to the 2008 ACS, there were an estimated 28,026 enrolled students from Grade 1 to graduate school in Richmond. Assuming that five percent of them bicycle to school (based on results from a 1995 Lamorinda School Commute Study by Fehr & Peers) means an additional 1,401 bicyclists.
- **Workers biking to transit:** The 2008 ACS estimated 7,160 Richmond workers who commuted to work by transit. Assuming that two percent of them bike to transit before continuing on their way to work—percentages cited at various times by BART and AC Transit—means another 143 bicycle commuters.

Table 4-2 | Daily bicycle commuters

Workers	239
Students	1,401
Bike-to-transit riders	143
Total	1,783

Non-commute bicycle ridership

Commute trips represent a minority of bicycle trips. To get a fuller sense of bicycling in a community, it is essential to account for the other reasons, apart from commuting, that people use bicycles. The *National Bicycling & Walking Study*, published by the Federal Highway Administration in 1995, estimated that for every commute trip made by bicycle there were 1.74 trips made for shopping, social and other utilitarian purposes.

We can estimate the number of these other bicycle trips in Richmond as follows:

- **Number of daily bicycle commuters:** 1,783 (per Table 2)
- **Number of daily trips per commuter:** 2 (assumed; one trip from home to work and one trip back)
- **Number of daily bicycle commute trips:** 3,566 ($1,783 \times 2$)
- **Daily bicycle trips for non-commute purposes:** 6,205 ($3,566 \times 1.74$)

Lastly, many people ride bicycles primarily for recreation. While the Richmond Bicycle Master Plan focuses on bicycling for transportation, it is important to keep recreational riders in mind in the formulation of projects and programs: with enough encouragement, including sup-

portive infrastructure, many recreational riders can be expected to make the transition to bicycle commuters. While we do not have reliable figures, Richmond likely has a substantial number of recreational cyclists. The City is blessed with mild weather; generally flat terrain; large expanses of open space and park lands; the longest shoreline of any city in the Bay Area; and attractive off-street cycling facilities, including the Richmond Greenway, the Wildcat Creek Trail and, of course, some of the longest and most scenic stretches of the San Francisco Bay Trail.

Projected Bicycle Ridership

If other communities are any indication, implementation of this plan will result in a sizable increase—at least in relative terms—in bicycle ridership and daily trips. Not surprisingly, bicycling studies from around the country have found a correlation between bikeway miles per capita in a given community and its number of bicyclists. In a 2003 case study by Alta Planning + Design of three cities—Portland, San Francisco and Seattle—that implemented bicycle improvements, “after” bicycle ridership on improved corridors was between double and triple the “before” numbers. (This is consistent with an observation in the National Bicycling & Walking Study that “There are ... three times more commuter cyclists in cities with higher proportions of bike lanes.”) Implementation of an interconnected network of facilities—as opposed to a system of improved, but not necessarily linked, corridors—would likely have an even more pronounced effect. Bicycling in Richmond could see particularly strong growth if efforts are made to improve personal safety and security and to deter bicycle theft through secure bike parking.

Assuming such a tripling in the ridership, the implementation of the Bicycle Master Plan would result in approximately 5,349 daily bicycle commuters throughout the City (1,783 [from Table 4-2] multiplied by

3). Similarly, daily bicycle trips for shopping, social and other utilitarian purposes would increase to 18,615 (6,205 [from Table 4-2] multiplied by 3). These are order-of-magnitude estimates based on limited data and informed suppositions. In any event, it is reasonable to expect that implementation of the Bicycle Master Plan would yield handsome environmental and quality-of-life dividends associated with more bicycling and less driving.

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5 . Existing Bicycle Network

This chapter addresses BTA requirement (c): a map and description of existing and [proposed] bikeways; and (e): a map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes.

INTRODUCTION

The Bicycle Master Plan sets forth a blueprint for completing a system of bikeways and support facilities within the City of Richmond. It builds upon the existing system of on-street and off-street bicycle facilities throughout the City, focusing on connections between neighborhoods, safe routes to schools and access to major destinations such as employment centers, stores and shops, parks, trails and open space areas. This Plan also includes criteria for defining different types of

bicycle facilities, a listing of priority projects, design standards and education and safety programs.

TYPES OF BIKEWAY FACILITIES

Bikeway planning and design in California typically relies on the guidelines and design standards established by Caltrans as documented in “Chapter 1000: Bikeway Planning and Design” of the *Highway Design Manual* (5th Edition, California Department of Transportation, January 2001). Chapter 1000 follows standards developed by the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA), and identifies specific design standards for various conditions and bikeway-to-roadway relationships. Caltrans standards provide for three distinct types of bikeway facilities, as generally described below and shown in the Design Guidelines.

Class I: Bike Path/Shared Use Path*

These facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicles cross-flow minimized.

Class II: Bike Lane*

Bike lanes provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.

Class III: Bike Route

Bike routes provide a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles. While a basic Class III route may simply have signs and markings, a **Bicycle Boulevard** is a special type of shared route that optimizes bicycle travel. Bike boulevards can have a variety of traffic calming elements to improve safety and comfort for bicyclists.

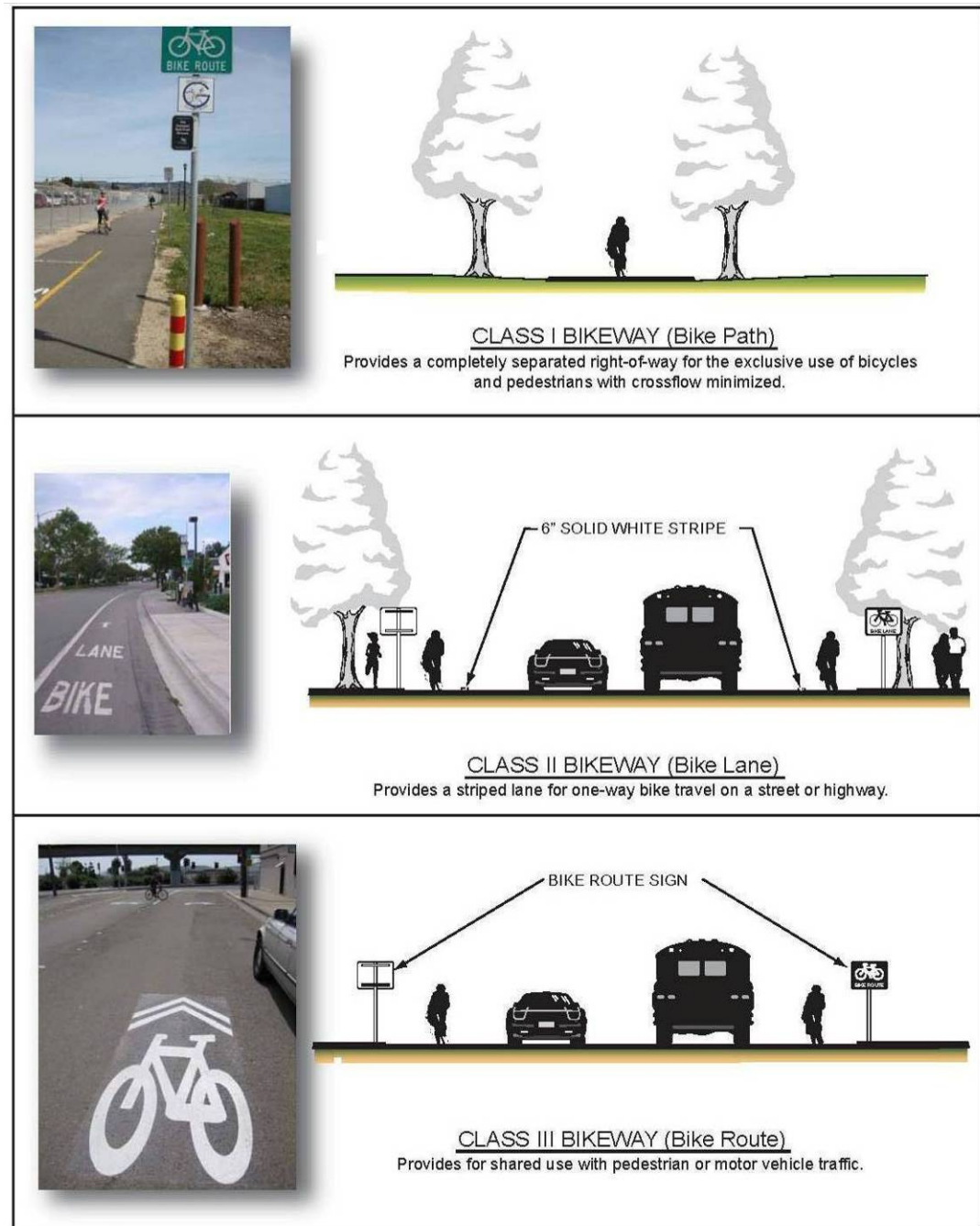
** Class I & II bikeways are not to be used by motorized vehicles. A motor vehicle is any vehicle or device that is self-propelled by means of a internal combustion engine or electric motor, used to transport a person or property. Motor vehicles include, but are not limited to passenger cars, motorcycles, off-road vehicles, "dirt-bikes," all-terrain vehicles, motorized skateboards and "Go-peds," motorized scooters.*

SHARROWS

A shared-use arrow (or "sharrow") can be marked in the outside lane on a Class III route to show the suggested path of travel for bicyclists. This is often done when the route has on-street parking, in order to encourage cyclists to ride a safe distance away from the parked vehicles' "door zone." The sharrow can also be used at intersections with multiple turn lanes to show bicyclists the recommended lane for through travel.



Figure 5-1 | Bikeway facility types



EXISTING CONDITIONS

The central core neighborhoods of Richmond have a grid-based network of streets that provide excellent opportunities to develop a bikeway system. Currently, the City's Class I Bay Trail and Richmond Greenway are the most well developed sections of the bikeway network, while most on-street facilities have been identified but not yet built. The outlying areas of the City, including Point Pinole, Hilltop, Parchester Village, and El Sobrante Valley are physically disconnected from the central City and bicyclists may cross other jurisdictions to and from them. Interjurisdictional coordination is needed to provide regional connectivity along the bikeway network.

Fehr & Peers conducted an inventory of existing multi-use paths, and on-street bikeway facilities in Richmond based on the City's and County's GIS data files, project documents provided by City staff, information from the Richmond Bicycle/ Pedestrian Advisory Committee and general public, and extensive field visits. The City currently has approximately 12 miles of on-street bikeway facilities and 29 miles of multi-use paths, consisting of approximately:

- 28.6 miles of Class I multi-use paths
- 6.7 miles of Class II bike lanes
- 5.3 miles of Class III bike routes

The Existing Bicycle Network map on the next page shows locations for all existing bikeways.

Map 5-1 | Existing bicycle network





Street and Central Avenue from Isabel Street to the end of a 4' high fence well before Central Avenue

Caltrans

- From the Albany border to Central Avenue and west along Central Avenue to the beginning of a 4' high fence where East Bay Regional Parks District becomes responsible for the maintenance

Republic Services: West County Landfill

Seacliff Homeowner's Association: Brickyard Cove Road and Seacliff Drive frontages of the Seacliff residential development

Richmond Greenway



Looking west towards Mt Tamalpais on the Richmond Greenway

Two major sections of the Richmond Greenway which is located just north of, and runs parallel to, Ohio Avenue have recently been completed. The western portion provides a path from 2nd Street to 23rd Street, while the eastern section connects Carlson Boulevard to San Pablo Avenue. When completed,

the Greenway will provide a seamless Class I east-west connection between the Ohlone Greenway (El Cerrito) and Bay Trail via Garrard Boulevard. Currently, three major gaps along the Greenway include access across San Pablo Avenue; a connection across 23rd

Street and the at-grade railroad tracks and Carlson Boulevard; and a segment between 2nd Street and Garrard Boulevard.

Wildcat Creek Trail



A completed section of Wildcat Creek Trail

Once completed, this creekside path will run from Wildcat Canyon Regional Park, through San Pablo, to the Richmond shoreline. Several sections on the west end of the path have been completed by the East Bay Regional Parks District.

Table 5-1 | Existing Class I multi-use paths

<i>Path</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Length (miles)</i>
Bay Trail	Point Isabel Regional Shoreline	Point Pinole Regional Shoreline	I	24.20
Richmond Greenway	2 nd Street	San Pablo Ave	I	2.42
Garrard Boulevard*	Ohio Avenue	Barrett Ave	I	0.63
Regatta Boulevard*	Marina Bay Pkwy	Marina Way South	I	0.63
Wildcat Creek Trail*	Richmond Pkwy	Shoreline	I	0.18
Total				28.06

*Part of Bay Trail Network

BIKE LANES AND ROUTES (ON-STREET)

The majority of Richmond's on-street bicycle facilities have been installed in the industrial areas around Point Richmond and Marina Bay on the south side of I-580. Bicycle facilities have also been installed along sections of 23rd Street and in east Richmond along the east side of I-80. The tables below provide a list of existing on-street facilities.

Table 5-2 | Existing Class II bike lanes

Street	From	To	Class	Length (miles)
Hensley Street*	Ohio Avenue	Bissell Avenue	II	0.15
Amador Street	Clinton Avenue	McBryde Avenue	II	0.51
Hall Avenue*	Harbour Way	Marina Way	II	0.51
South Garrard Ave*	Ohio Avenue	Cutting Boulevard	II	0.46
Cutting Blvd*	Canal Boulevard	Hoffman Blvd	II	0.77
Canal Boulevard*	Seacliff Drive	Cutting Boulevard	II	0.65
Wright Avenue*	Harbour Way	Marina Way	II	0.23
Harbour Way* ^{***}	Wright Avenue	Hall Avenue	II	0.60
Key Boulevard	Humboldt Street	Amador Street	II	0.85
Lucas Avenue	Ortho Way	Calspray Street	II	0.17
Ohio Avenue	Garrard Avenue	2 nd Street	II	0.59
Broadway Street	Carlson Boulevard	Macdonald Ave	II	0.30
24 th Street	Broadway Street	Macdonald Ave	II	0.21
Marina Way	Macdonald Ave	Barrett Avenue	II	0.20
Nevin Avenue	Nevin Plaza	11 th Street	II	0.10
			Total	6.70

*Part of Bay Trail

**Class II northbound only

Table 5-3 | Existing Class III bike routes

Street	From	To	Class	Length (miles)
Cutting Boulevard	31 st Street	Carlson Boulevard	III	0.08
Carlson Avenue	Cutting Boulevard	Potrero Avenue	III	0.38
Potrero Avenue	Carlson Boulevard	Ohlone Greenway	III	1.05
Clinton Avenue	Amador Street	Sonoma Street	III	0.23
Regatta Boulevard*	Marina Way	Marina Bay Parkway	III	0.73
Harbour Way* ^{***}	Wright	Hall	III	0.60
Marina Bay Parkway/ 23rd Street*	Ohio Avenue	Harbour View Drive	III	1.69
Marina Way*	Wright Avenue	Hall Avenue	III	0.51
Nevin Avenue	11 th Street	Harbour Way	III	0.05
			Total	5.32

*Part of Bay Trail

** Class III southbound only

ONGOING BIKEWAY PROJECTS

The City has many bicycle-related projects already underway. The following list includes projects that are in the design or construction phase, as shown in the map on the next page.

- Atlas Road Entry to Point Pinole (2010)
- West County Landfill Loop & Wildcat Creek Connection (2010)
- Donation of Trail Easement by Chevron for the connection to Point San Pablo (2009)
- Design study for a path connecting the Point Richmond Bay Trail to the Richmond-San Rafael Bridge (2009)
- Harbour Way Bike Lanes (2009)
- Keller Beach to Ferry Point Bay Trail Segments (2010)
- 23rd Street Streetscape Improvements (2008); the project, which is being coordinated with improvements on 22nd Street, includes two-way conversion, lane reduction, sidewalk and intersection improvements, lighting and landscaping
- Nevin Avenue Streetscape Improvements (2010); includes sidewalk and intersection improvements, traffic calming, lighting, landscaping and a Class III bike route
- New signalized crossing for the Richmond Greenway-Ohlone Greenway at San Pablo Avenue (2010)
- Ferry Point Loop Trail Guide (2009)
- Ford Point Bay Trail Loop (2009)
- Hall Avenue Bike Lane Racks (2009)
- Marina Way Streetscape Improvements (2010); project includes road diet, bike lanes, lighting and landscaping
- Carlson Boulevard Corridor (2010); includes street repaving, bike lanes and detection, traffic calming, new pedestrian crossings and flattening of the roadway slope

Map 5-2 | On-going projects



Key Issues and Opportunities of the Bikeway Network

Several challenges and opportunities with the bicycle network have been identified through the development of the Bicycle Master Plan. The following section discusses the key issues to be addressed in the Proposed Facilities section and Design Guidelines.

Wide Streets and Intersections



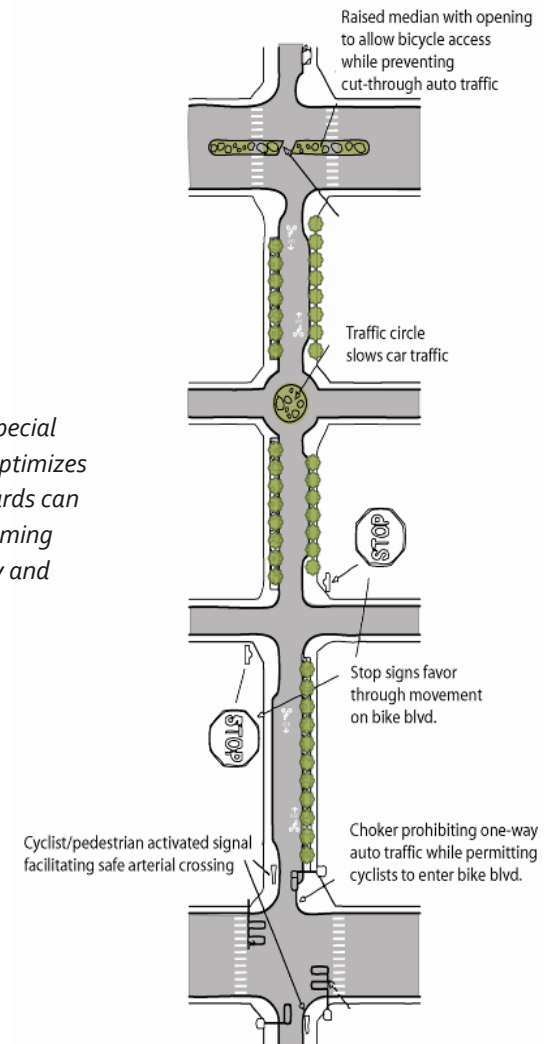
7th Street has excess capacity that can easily accommodate future bicycle lanes

Road Diets: Much of Richmond's roadway system was developed to facilitate and support industrial production during World War II and accommodate cross-Bay traffic. Since that time, the City's industries have dwindled and major freeways have been built in the City to handle regional and inter-city

vehicle travel. As such, the street network has many wide streets that no longer have the vehicle volumes that they once did. Many of Richmond's community and regional connector streets have fast moving traffic, which reduces the safety and comfort for bicyclists and pedestrians. There are multiple opportunities to consider road diets, which reduce the width and/or number of vehicle travel lanes and provide extra space for bike lanes and other bicycle and pedestrian friendly facilities. In several cases, such as on 7th Street (in photo above, right), road diets could result in the dedication of excess right-of-way back to adjacent parcels, which could be an important economic development tool.

Bicycle Boulevards: Most of south and central Richmond is on a grid-based system of streets, which provides excellent opportunities for bicycle travel within neighborhoods. The City's residential streets are well connected and generally narrow, with slower paced traffic. These areas are ideal for less experienced bicyclists and bicyclists who do not feel as comfortable riding on higher speed roads with heavier traffic. There are multiple opportunities for bicycle boulevards and other facilities that give priority to bicyclists and pedestrians in these areas.

*A **Bicycle Boulevard** is a special type of shared route that optimizes bicycle travel. Bike boulevards can have a variety of traffic calming elements to improve safety and comfort for bicyclists.*



Intersections: Several loop detectors for actuating signal changes do not register the presence of bicyclists at intersections. Oftentimes bicyclists must wait through lengthy signal cycles or risk proceeding through the intersection against the light. Bicycle-specific detectors should be considered at major intersections along the bike network and stencils should be used to inform bicyclists where to position their bikes in order to actuate the signal. Specifications are provided in the Design Guidelines section.

Physical Barriers

- Richmond has multiple at-grade rail-road tracks and railyards throughout the City, some of which are still active. Railroad tracks are a significant barrier to bicycling and walking in Richmond, and bicycle access is limited in several areas. In particular,



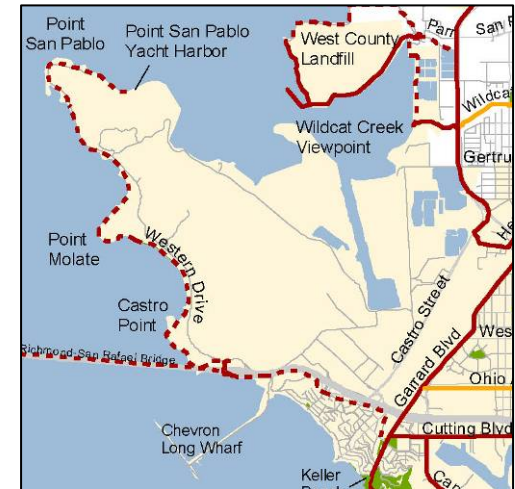
The 33rd Street Bridge provides non-motorized access over the BART tracks

connections within the Iron Triangle neighborhood are heavily constrained by railroad tracks. Most significantly, the newly built Richmond Greenway has a critical gap at 23rd Street and Carlson Avenue, where the railroad and BART tracks pass through. The Richmond BART Station is also a terminus for two BART lines.

- Large industrial sites also present an obstacle to bicycle connectivity. Specifically, Chevron occupies a large area of the Richmond waterfront by Point Molate and Point San Pablo. Completing the Bay

Trail connection through the refinery and its Long Wharf have presented a major obstacle to completing the Bay Trail between Castro St. and the existing trail under the Richmond/San Rafael Bridge.

- Multiple freeways present linear barriers throughout the City: the Richmond Parkway constrains access to the western waterfront, I-580 separates Point Richmond, Ford Point and Marina Bay from central core of the City, and I-80 limits access to neighboring communities such as Albany, El Cerrito, San Pablo and the Richmond Hills.



The Chevron property presents a major barrier along the Bay Trail

Freeway Interchanges

Richmond's proximity to I-580 and I-80 necessitates multiple connector street-freeway interchanges on the south and east sides of the City. Characterized by fast moving vehicular traffic, wide travel lanes and multiple turning lanes, these interchanges could be improved to provide a safer passage for bicyclists.

Access to Transit

Richmond's intermodal transit station provides access to BART, AC Transit, Golden Gate Transit and Amtrak. Providing safe and comfortable bicycle and pedestrian access to the station area will facilitate multi-modal trips and help to reduce auto trips. Way-finding signage,

secure bicycle parking and connectivity to the Richmond bicycle network should be prioritized.

Access to the Bay Trail, Richmond Greenway and Ohlone Greenway



The eastern portion of the Richmond Greenway has few access points

The Bay Trail, provides some of the most scenic, well connected and protected bicycle facilities in the area. The Richmond Greenway which traverses the central city will extend the Ohlone Greenway which runs on to Berkeley through the intervening cities of El Cerrito and Albany and eventually connect to the

greater Bay Trail to create a continuous system of regional paths. Several barriers to the completion of these multi-use paths and connections to them, however, remain a challenge:

- Freeways and freeway interchanges
- Railroad crossings
- San Pablo Avenue
- Richmond Parkway
- 23rd Street/Carlson Boulevard/ Broadway
- Adequate funding and obtaining property interest required to complete Trail sections

Regional Connections

As noted above, outlying areas of the City, including Point Pinole, Hilltop, Parchester Village, and El Sobrante Valley are physically disconnected from the central City and bicyclists must cross other jurisdictions to access these areas. Interjurisdictional coordination is needed to provide regional connectivity along the bikeway network.

Bike access on the Richmond-San Rafael Bridge continues to be a high priority for bicyclists. For more than a decade, public access advocates, elected officials, and local jurisdictions have been seeking a safe, viable option for bicycle and pedestrian access on the bridge. The bridge is owned and operated by Caltrans, which has historically denied non-motorized access citing safety, cost and vehicular capacity concerns. The goals and policies of the Richmond Bicycle Plan support efforts to provide bridge access to all users.

Pavement Quality

Several important bicycle routes have very poor pavement conditions. Roadway surfaces are often rough, crumbling and pot-holed, and the roadway and gutter seam where bicyclists are often positioned is frequently uneven. The City should prioritize repaving streets on the bicycle network first.

Secure Bicycle Parking

Both short-term and long-term bicycle parking are needed in key commercial areas, at large employment areas, transit hubs, schools, parks and other community destinations. Security is a significant concern to residents and visitors, and bike parking facilities should provide a high level of security to protect from theft. The addition of secure bicycle parking will be a critical component of encouraging people to bicycle in Richmond and should be prioritized.

Signage and Wayfinding

Richmond's bikeway routes have basic signage indicating where bike lanes and routes are present, begin and end. In several areas signs are missing or obscured by trees and other barriers. Access to the Bay Trail and Richmond Greenway from the roadway is often difficult to identify and once found, there is little to no wayfinding signage directing path users to near-by destinations. The City of Richmond does not currently have a signed route system that would indicate destinations, distances and directions.



Signage along the Richmond Greenway

on street network. Signage should be of a scale appropriate for cyclists. Please refer to the Design Guidelines specifications on signage.

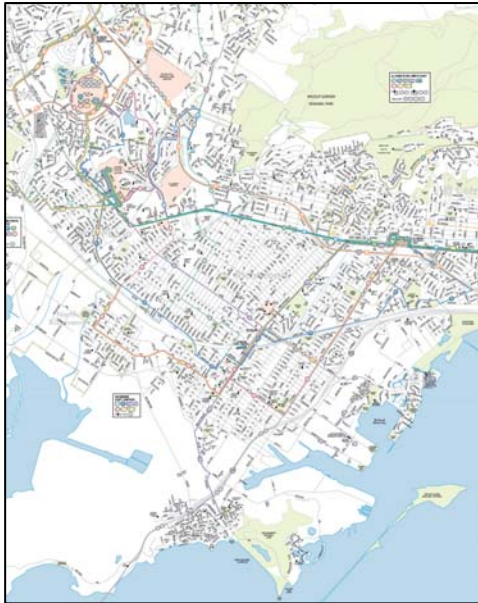
The wayfinding and signage system should be enhanced to help make the bicycle network more visible and easy to navigate. In particular wayfinding improvements are needed to better connect the on-street and off-street bike network. On-street signage and pavement markings would help to create better connections to the off-street network. From the Bay Trail and Richmond Greenway, additional signage would enhance connections back to the

Multi-Modal Connections

Richmond has a major intermodal transit hub in the center of the City, which is served by AC Transit, Bay Area Rapid Transit (BART), Golden Gate Transit and Amtrak. The intermodal transit hub is a critical connection point for passengers traveling throughout the Bay Area, California, and destinations throughout the U.S. It is the only station that provides direct transfer between Amtrak and BART. In addition, AC Transit bus stops are located on corridors throughout the City.



AC Transit operates nine local routes in Richmond. These include the following lines: 7, 70, 71, 72, 72M, 72R, 74, 76, and 376-night. The buses typically operate with 30 to 60-minute headways and connect to key destinations within and near Richmond including the Richmond Parkway Transit Center at Richmond Parkway and Blume Drive, the Richmond BART Station, the El Cerrito Del Norte BART Station, Downtown Richmond, Marina Bay, Contra Costa College and Hilltop Mall. In addition to local routes, three AC Transit Transbay routes operate from Richmond to the San Francisco Transbay Terminal in the a.m. peak hours and from the San Francisco Transbay Terminal to Richmond in the p.m. peak hours.



A section of the AC Transit bus route map within Richmond

AC Transit has several ways bicyclists can store their bikes when traveling on a bus. All buses are equipped with front-mounted racks that hold up to two bicycles. On Transbay busses, two additional bikes can be stored in the cargo bays when the front rack is full. Folded or collapsed bicycles may be carried on board anytime, as long as they do not block seats or aisles. In the event where all the bicycle storage on the bus is full, the

patron will either have to store their bike at the bus stop or wait for the next bus. Bicycles are allowed on the last bus of the night at the driver's discretion. On night owl service (midnight to 5:30am), riders may carry bikes inside the bus only if the rack is full and space is available.

Other bus transit providers serving Richmond include Golden Gate Transit, which operates two routes (40/42) to the San Rafael Transit Center from Richmond, and WestCAT, which provides a commute express bus route from the Richmond Parkway Transit Center to the El Cerrito Del Norte BART Station. WestCAT also provides express bus service between the El Cerrito Del Norte BART Station and Hercules Transit Center with stops alternating between Richmond Parkway Transit Center and Hilltop Shopping Center. The recently

completed Richmond Intermodal Transit Station, located near the Richmond BART station, provides links between BART, Amtrak, AC Transit and Golden Gate Transit.

BART, the regional commuter rail transit system, provides service at the intermodal Richmond Station on the Richmond-Daly City-Millbrae and Richmond-Fremont lines. Bicycles are allowed on all Richmond-Fremont trains regardless of time of day, and as long as the car is not already crowded, and all other BART trains during non-commute hours and all day on weekends and holidays. During morning commute hours (7:05AM-8:50AM), bikes are allowed in the Embarcadero Station only for trips to the East Bay. During evening commute hours (4:25PM-6:45PM), bicyclists traveling from the East Bay must exit at the Embarcadero Station. Bikes cannot enter or exit 12th and 19th Street Oakland Stations on weekdays between 6:56AM - 8:50AM and 4:35PM - 6:40PM. Folding bikes are allowed on trains at any time.

BART's Bicycle Access and Parking Plan (August 2002) contains recommendations for access and parking improvements for both existing and future stations, as well as promotions, incentives, support and education for existing and potential bicyclists. According to the plan, the Richmond BART Station has a high priority for bicycle parking improvements. BART has recently developed wayfinding signage for bicyclists both in station areas and on surrounding bikeways and other roads. These signs help direct bicyclists to the station, as well as to bicycle parking, stairs and elevators. Currently, the Richmond BART Station has 21 bike racks outside the gate area and two bike lockers at the west side entrance on ground level.

Amtrak's Capitol Corridor and San Joaquin trains stop at the intermodal Richmond Station. The westbound route connects with Berkeley, Emeryville, San Francisco and Oakland. Eastbound, the Capitol

Corridor extends to Davis, Sacramento and Auburn in California, and Reno and Sparks via bus in Nevada. In each direction, 16 trains stop at the Richmond Amtrak Station on the Capitol Corridor route. In total, 40 passenger trains per weekday make stops at the Richmond Station. Bicycles are permitted on all Capital Corridor trains.



Photo by Eric Haas (www.redoveryellow.com)

6 . Proposed Bicycle Network

This chapter addresses BTA requirement (c): a map and description of existing and proposed bikeways; and (e): a map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes.

While all streets should be designed to accommodate bicycles, the proposed bikeway network consists of routes that are designed to be the primary system for bicyclists traveling in and through Richmond. The bikeway network is a tool that allows the City to focus and prioritize implementation efforts where they will provide the greatest community benefit. Streets or corridors selected for inclusion in the network should be targeted for specific improvements, such as the installation of bicycle lanes, off-street paths, or signage. It is important to recognize that by law, unless explicitly prohibited (as they are on

the Richmond-San Rafael Bridge, I-580 with the exception of a short segment between the Bridge and Pt. Molate, and I-80), bicyclists are allowed on all streets and roads regardless of whether the streets and roads are a part of the bikeway network. Once completed, the proposed network will provide safer and more direct travel paths throughout the city.

The proposed system was developed according to the following planning criteria:

Comfort & Access: The system should provide equitable access from all areas of the city for commute, utilitarian and recreation routes, and should be designed for bicyclists of all levels of ability. Ideally, the system should provide a bicycle path, lane, or route within one-half mile of any residential street.

Purpose: Each link in the system should serve one or a combination of these purposes: recreation, commuting, utilitarian and provide a connection to the citywide bike network. On-street facilities should be continuous and direct, and off-street facilities should have a minimal number of arterial crossings and uncontrolled intersections.

Connection to Transit and Employment/Retail Centers: The intermodal transit village, Downtown Richmond, Hilltop Mall area, Ford Point and other major retail and employment centers should be accessible from all neighborhoods by a reasonably direct system.

Connection to Schools and other Community Facilities: Schools and community facilities, senior centers, recreational centers, the skate park and the Civic Center area should be accessible by bike.

Connection to the Waterfront, Parks and Open Space: Richmond's waterfront, parks and open spaces should be accessible so that residents are able to bike from home to both local and regional recreation.

Connection to Regional Bikeways: The bikeway system should provide access to regional bikeway routes, regional trails, and routes in adjacent communities.

Table 6-1 | **Length of bikeway system** (miles)

<i>Bikeway Classification</i>	<i>Existing</i>	<i>Proposed</i>	<i>Total</i>
Class I	28.1	30.0	58.1
Class II	6.7	32.0	38.7
Class III	5.3	42.4	47.7
Total	40.1	104.4	144.5

The maps on the following two pages illustrate the Citywide Existing and Proposed Bikeway Network and a close-up map of Central Richmond. The proposed system includes a total of approximately 100 miles of new bikeway facilities in addition to the 40 miles currently in place. The table above shows the number of proposed miles for each bikeway classification.

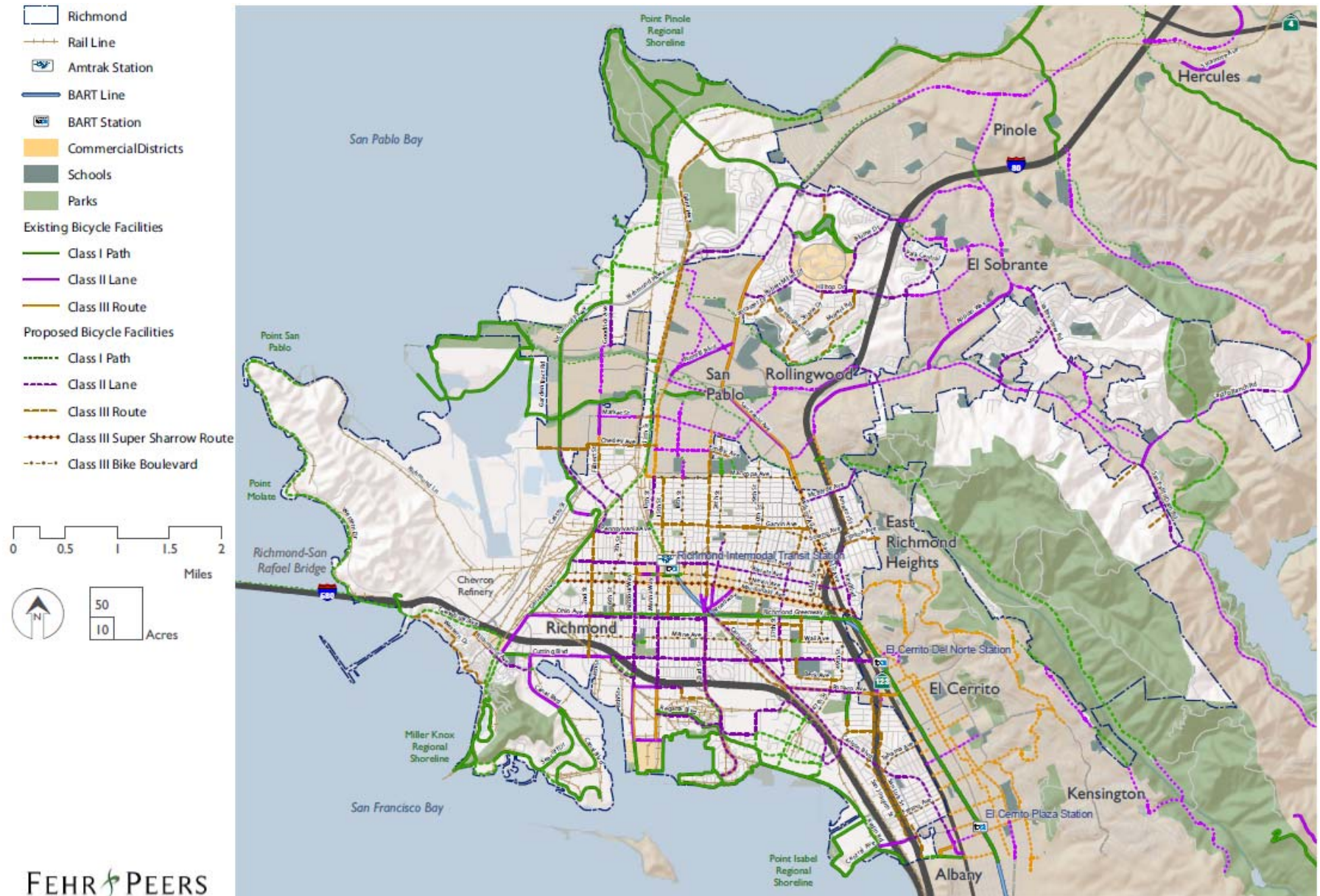
A complete list and description of proposed bikeways is included in Appendix A and is organized in the following way:

- Central Richmond – North-south and east-west routes
- Hilltop Area
- El Sobrante Valley
- The Bay Trail and Wildcat Creek Trail segments

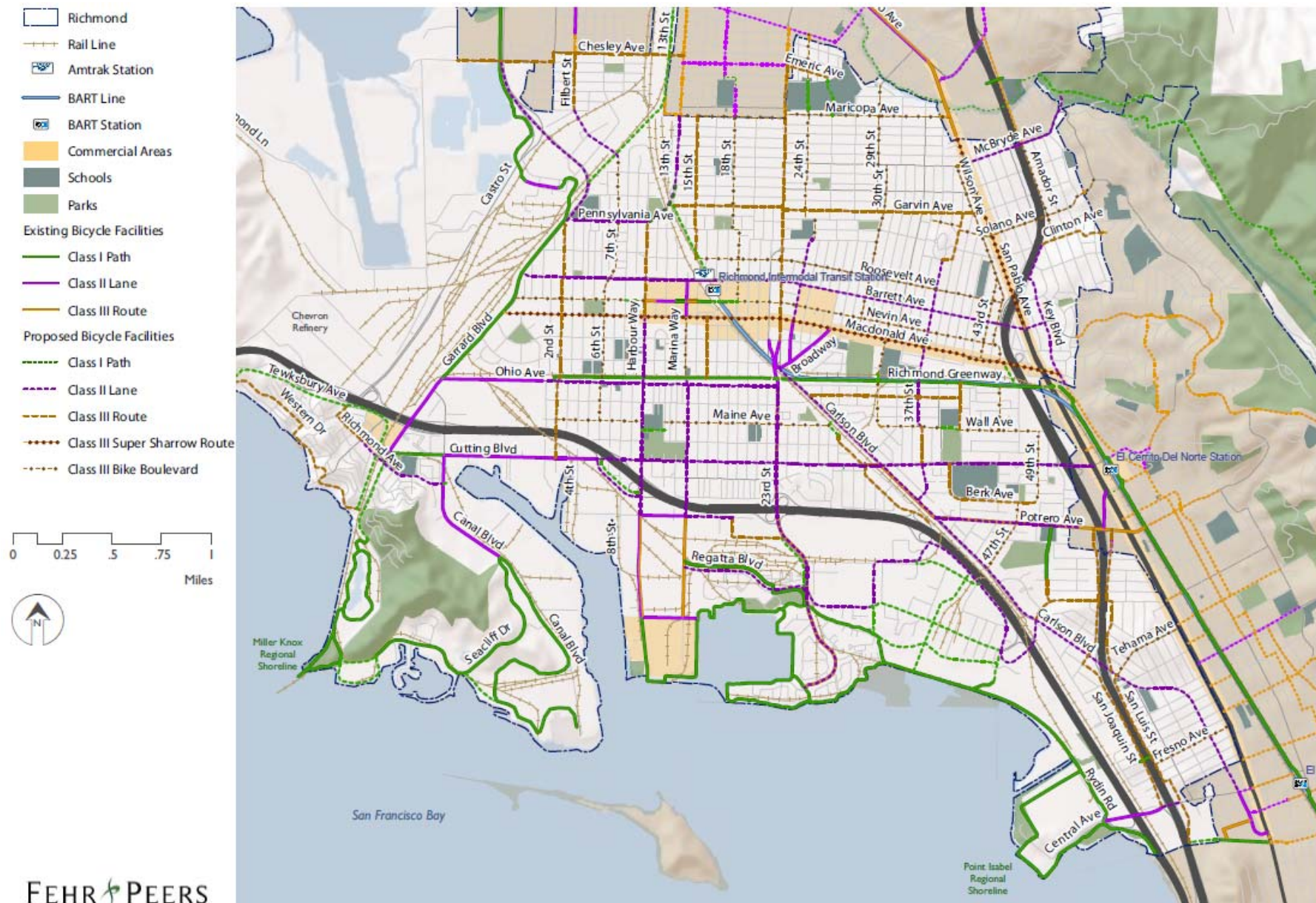
A primary goal is to provide continuous bikeways with the greatest degree of bicycle comfort possible. These on- and off-street bicycle facilities will provide local and regional access across Richmond and to neighboring jurisdictions. Where appropriate, City staff should coordinate the planning of these facilities with the Cities of El Cerrito, San Pablo, Pinole and Hercules to ensure continuity across city boundaries.

In addition, City staff should coordinate closely with local transit providers such as AC Transit and BART to ensure that the bicycle network is well integrated with and supportive of transit access and operations. Proposed bikeways along streets with bus service should be designed to optimize safety and minimize conflicts between bicyclists and buses.

Map 6-1 | Existing and proposed bicycle network



Map 6-2 | Existing and proposed bicycle network in Central Richmond



Central Richmond

The Central Richmond area includes all neighborhoods on the south side of the City of San Pablo, including East Richmond, Point Richmond, and the Richmond Annex. The proposed on-street facility improvements for Central Richmond are organized from north to south and east to west. These include many Class II bike lane segments and Class III routes, as well as several Class I path connections across railroad tracks, and through schools and neighborhood parks. In addition, several short- and long-term recommendations are provided that also aim to calm traffic and enhance the pedestrian environment. For example, the newly built eastern and western spans of the Richmond Greenway have several critical gaps that have been identified as high priorities for the proposed system. The map on the previous page includes the proposed network for Central Richmond. Many of these recommendations are also included in the *Pedestrian Plan*, and should be coordinated to the fullest extent possible.

Hilltop Area

The Hilltop Area includes the neighborhoods surrounding the Hilltop Mall, as well as Parkchester Village and Hilltop Green. Several bikeways are proposed for the Hilltop area and surrounding neighborhoods of North Richmond. Wherever possible, Class I paths and Class II bike lanes are recommended. A primary objective for the bike network in these neighborhoods is to provide access to the Bay Trail, and regional access to neighboring jurisdictions and Central Richmond.

El Sobrante Valley

Neighborhoods in the El Sobrante Valley area have a more suburban-rural character, and are defined by the surrounding East Bay Hills and Sobrante Ridge Regional Preserve. Access to open space and connections to regional bikeways are a primary focus for these communities.

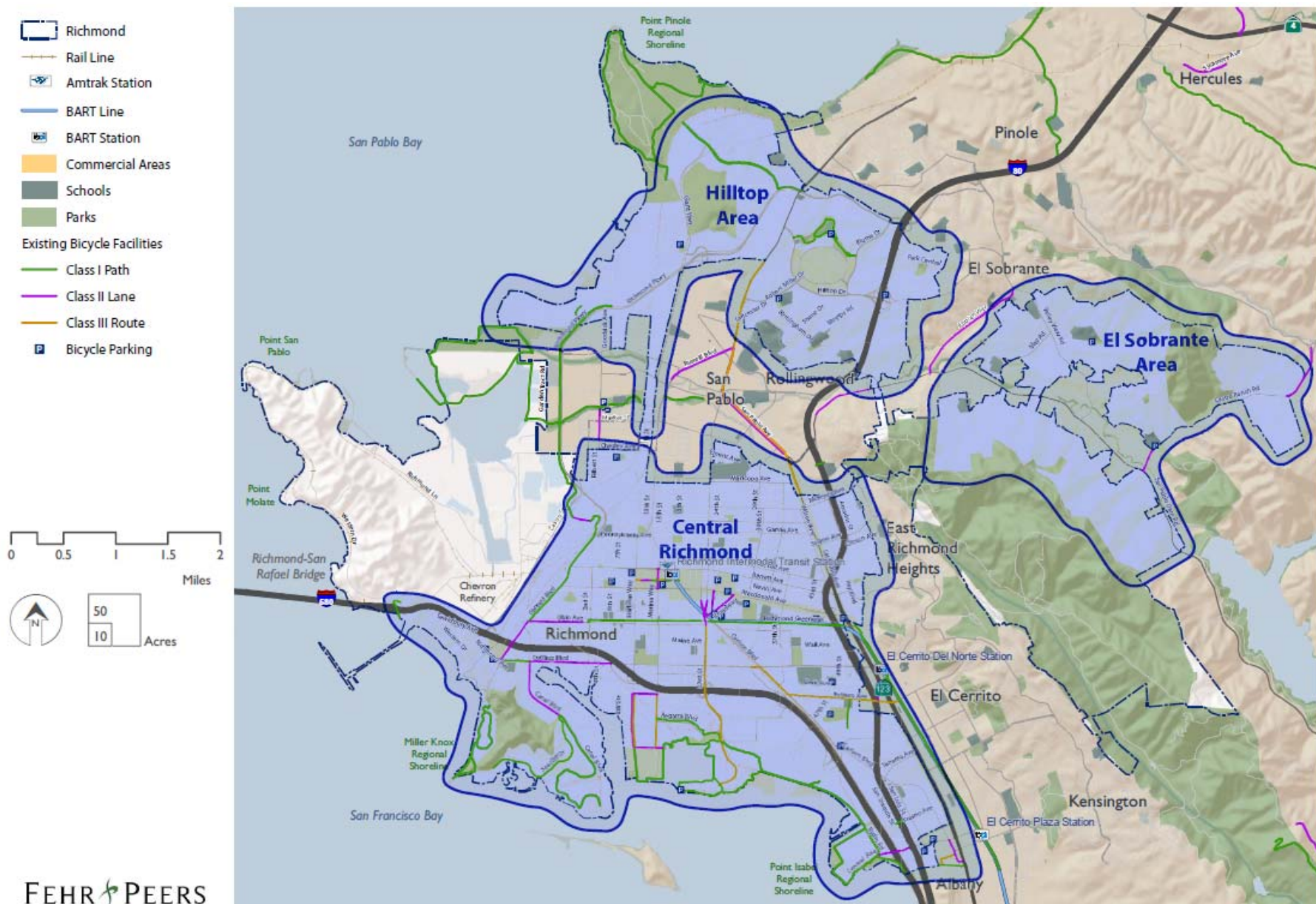
The Bay Trail and Wildcat Creek Trail

Richmond's system of trails and greenways boasts some of the best multi-use paths in the Bay Area. Thanks to the hard work of TRAC and many others, over 30 miles of the Bay Trail have already been completed and an additional 11 are planned. In addition, the Wildcat Creek Trail provides a scenic ride along the creek, and will benefit from an at-grade crossing at the Richmond Parkway.

Key proposed Class I projects include, but are not limited to:

- All proposed Bay Trail improvements included in the *San Francisco Bay Trail Plan*
- Improvements around the Plunge and tunnel entrances in Point Richmond
- Wildcat Creek Trail – at-grade signalized crossing at the Richmond Parkway

Map 6-3 | Sub-Planning areas



Focus Areas

As part of the master planning process, several focus areas were identified for site-specific recommendations and conceptual plans. The recommendations include short- to long-term improvements, and should be considered as a resource for best practices in bikeway design for other areas in the city. In addition, these plans can be used to pursue project-specific grant funding. The focus areas include the following:

1. Key Bicycle Corridors
2. Road Diets
3. Neighborhood Routes
4. Connecting the west and east spans of the Richmond Greenway
5. Improving safety and access along freeways and through interchanges
6. Improving access to the Bay Trail and waterfront
7. Pt Richmond Bay Trail Improvements at the Plunge

Focus Area 1 – Key Bicycle Corridors

Much of Richmond has a well connected street network which provides an excellent opportunity for the City to develop a two-tiered bicycle network for both beginner and more advanced bicyclists. Many residential and regional collector streets provide the most direct connections, but also have heavier and fast-moving vehicle traffic. Wherever possible, Class II bike lanes are recommended for the majority of these streets and should be protected from vehicle traffic to the fullest extent possible. These bikeways may be most appropriate for commuting purposes and access to regional destinations, and will likely attract more experienced bicyclists.

As detailed in the Design Guidelines, bike lanes should be a minimum of five feet wide with a preferred width of six feet, measured from the

face of the curb with a minimum area outside of the gutter pan of four feet (three feet for a five foot bike lane). A four foot lane is allowed where there is no on-street parking and no gutter, but is not preferred. When necessary to provide this width, vehicle lanes should be narrowed to 11 feet and in some circumstances a 10 foot curb-side lane. Parking lanes can be narrowed to seven feet. In implementing projects, the City should endeavor to avoid discontinuous segments. For example, bike lanes should be continuously striped to an intersection, and bikeways and directional signage should be provided on both sides of the street.

Recommended Bicycle Facilities for Key Corridors

The following bicycle-friendly treatments may be considered along key corridors. These treatments are described in detail in the Design Guidelines.

- 6' bike lanes
- Physically separated bike lanes or paths with buffer
- Colored bike lanes
- Bicycle loop detection
- Bike boxes
- Super Sharrows
- Accommodation at large intersections and freeway interchanges
- Signage & Wayfinding
- In-street Bicycle Parking

In all cases, bicycle lanes should be striped and marked on both sides of the roadway at one time to provide continuity and discourage wrong-way riding. “Bikes Wrong Way” should be used on the backs of bike lane signs (only visible to riders traveling in the wrong direc-

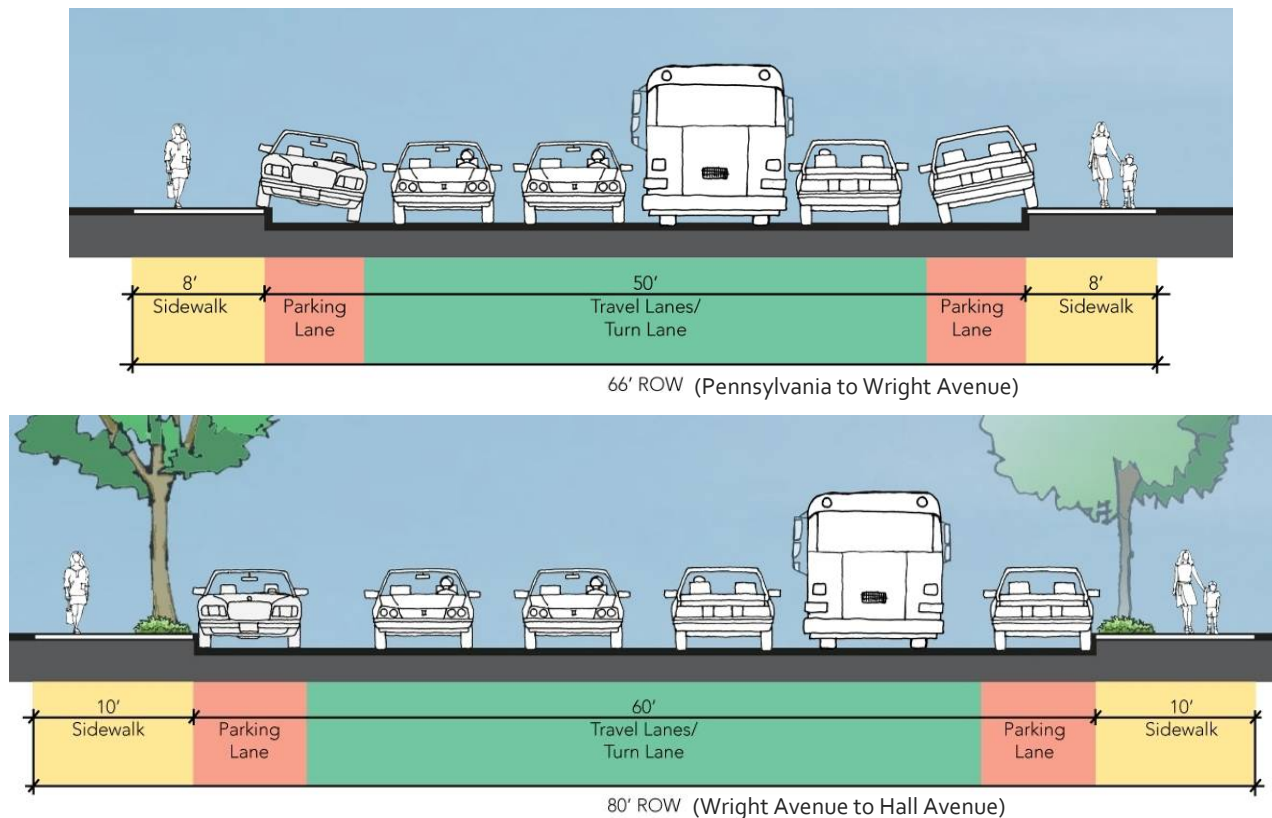
tion). If there are shorter segments of the corridors where there is insufficient width for bicycle lanes, it may be appropriate to provide on-street signage or stencils to raise the visibility of bicyclists and alert motorists that they are likely to encounter cyclists.

In addition to standard bike lanes, several bicycle design and traffic calming treatments should be considered to enhance the comfort and safety along specific routes. These treatments are described in detail in the Design Guidelines. Examples of key corridors in Richmond include, but are not limited to:

- Barrett Avenue
- Cutting Boulevard
- Carlson Boulevard
- Harbour Way
- Marina Bay Pkwy/23rd St
- 37th Street
- San Pablo Avenue
- Hilltop Drive
- Blume Drive
- San Pablo Dam Road

The following graphics provide illustrative examples of proposed improvement options for Key Corridors.

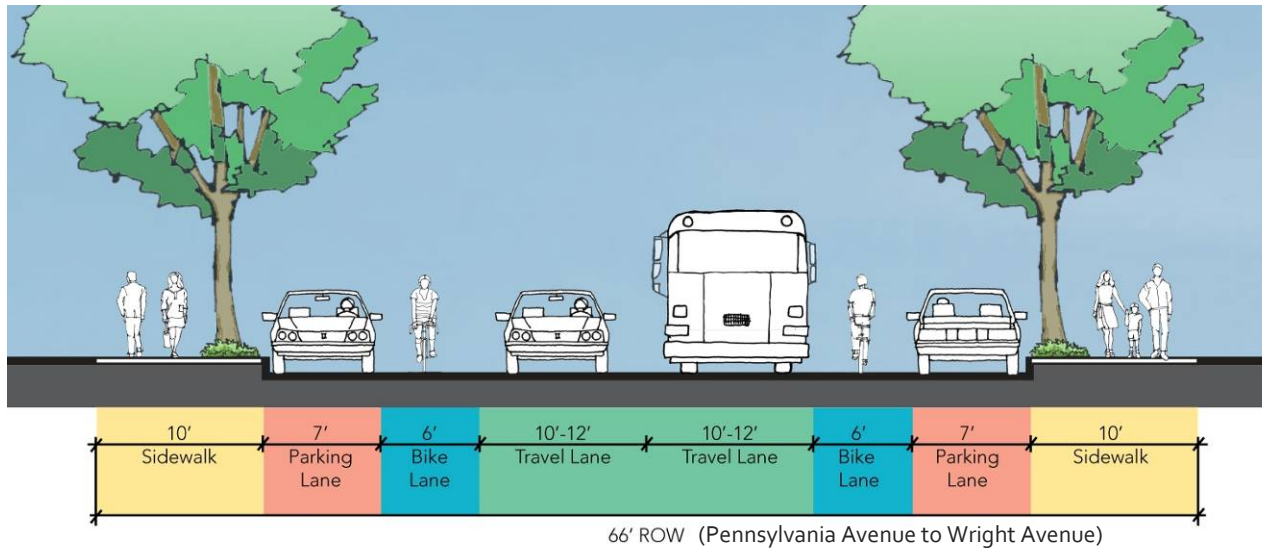
Figure 6-1 | Harbour Way alternative configurations



Existing Roadway

Graphic source: Richmond Pedestrian Plan

Harbour Way – Proposed Bike Lanes with Parallel Parking, 66' ROW



Harbour Way – Proposed Bike Lanes with Parallel Parking and Raised Median, 80' ROW

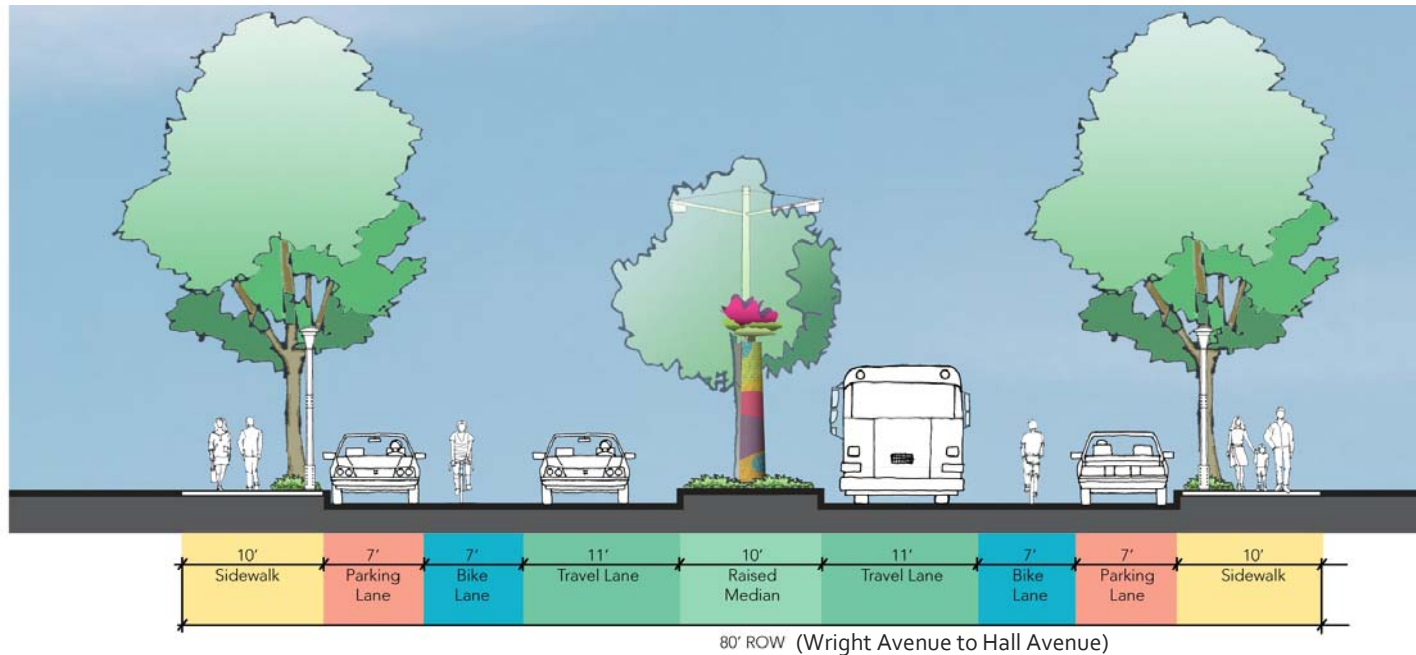
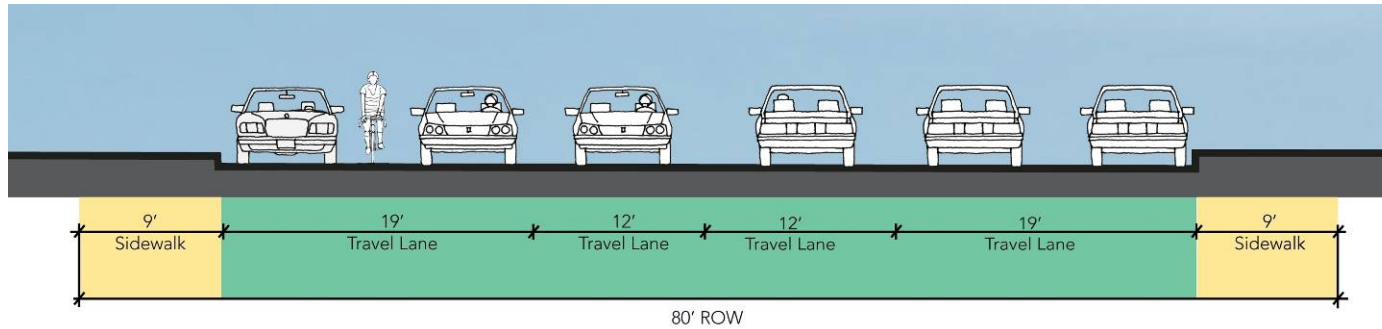
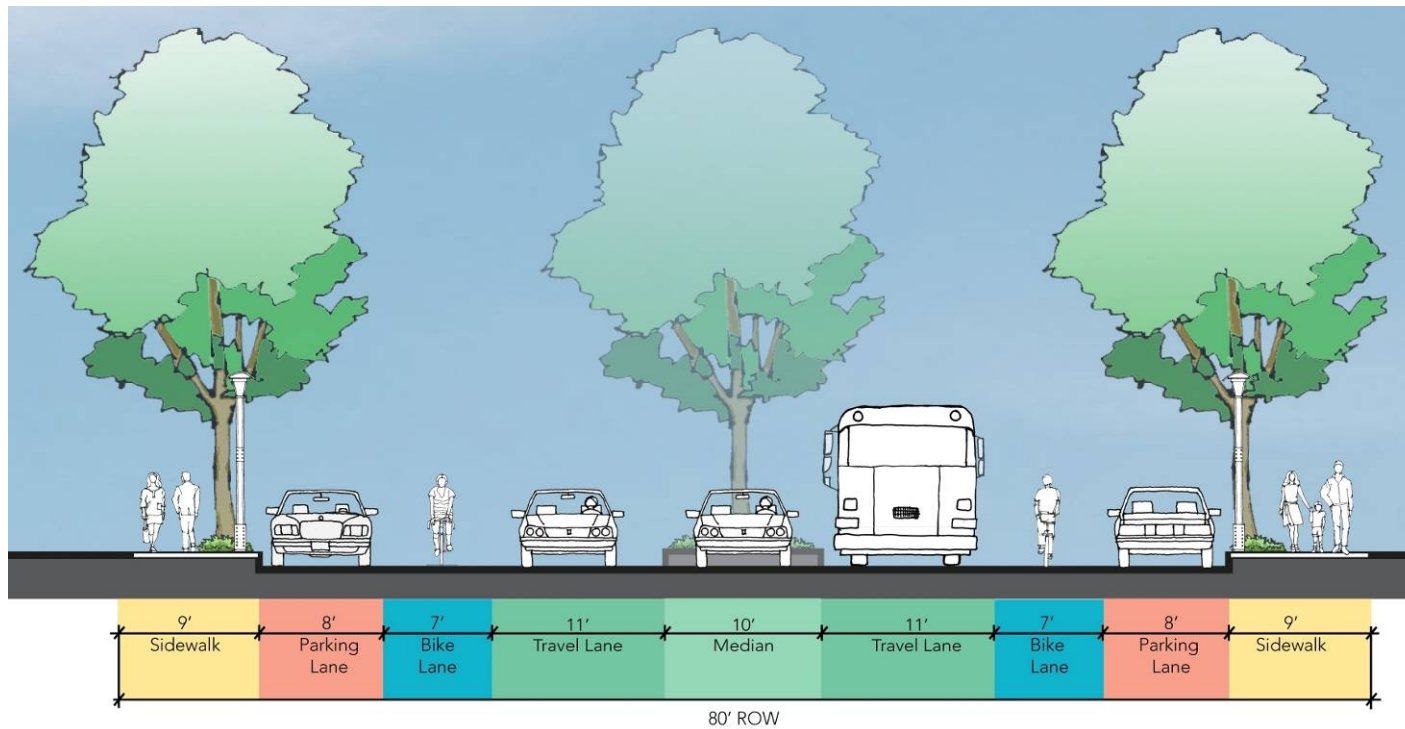


Figure 6-2 | South 23rd StreetSouth 23rd Street – Existing RoadwaySouth 23rd Street – Proposed Bike Lanes with Parallel Parking and Raised Median

Graphic source: Richmond Pedestrian Plan

Focus Area 2 – Road Diets

Many of Richmond's collector streets are excellent candidates for a road diet. A road diet refers to street improvements in which the number of vehicle travel lanes is reduced by adding bicycle and parking lanes, widening sidewalks, and converting parallel parking to angled or perpendicular parking. In addition to creating more space for bicyclists and pedestrians, road diets are also a good traffic calming and traffic safety tool. Roadways with surplus roadway capacity (typically multi-lane roadways with less than 15,000 to 17,000 vehicles per day) and high bicycle volumes, and roadways that would benefit from traffic calming measures are most appropriate for this type of treatment.

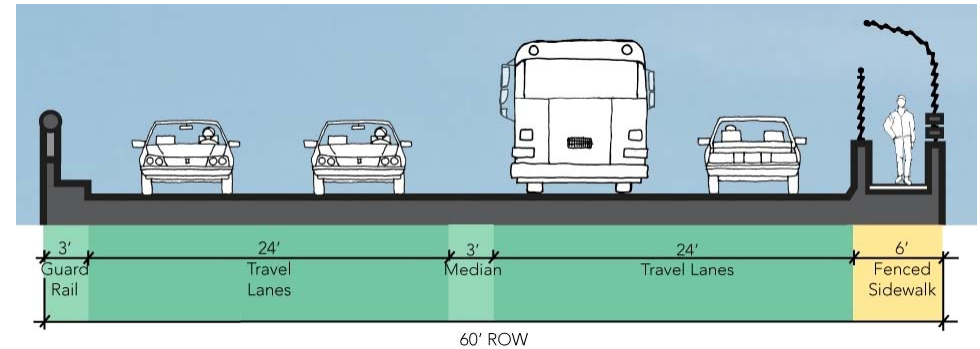
Any candidate road diet project along a current or future planned AC Transit routes should be planned in close coordination with AC Transit to ensure that bus operations are not negatively impacted by changes to the roadway. Candidate streets for road diets include but are not limited to:

- Barrett Avenue
- Cutting Boulevard
- Carlson Boulevard
- Harbour Way
- Marina Bay Pkwy/23rd St
- 37th Street
- Pennsylvania Avenue

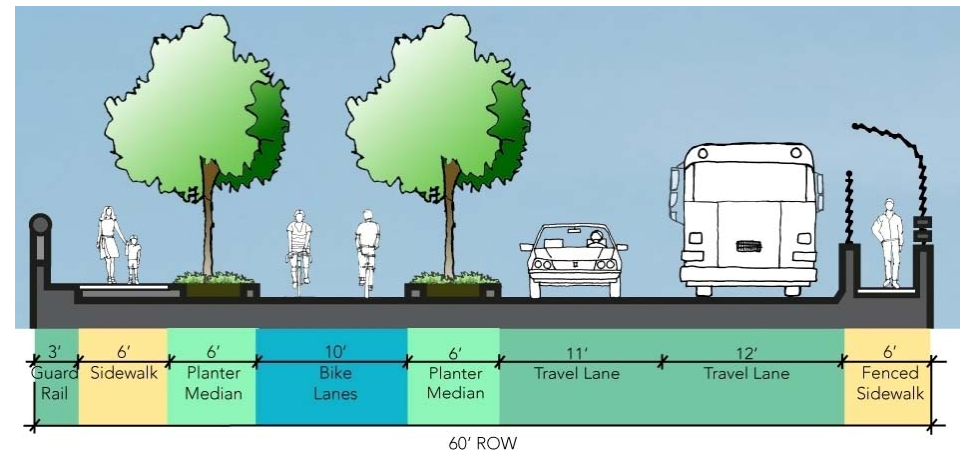
For example, proposed road diet improvements to the Pennsylvania Avenue overpass include sidewalk improvements and a physically separated two-way bike lane. These facilities will improve bicycle and pedestrian access to the Iron Triangle and North Richmond neighborhoods.

Figure 6-3 | Pennsylvania Avenue alternative configurations

Pennsylvania Avenue Overpass – Existing



Pennsylvania Avenue Overpass – Proposed



Pennsylvania Ave/ Harbour Way/13th Street Overpass Improvements



Graphic source: Richmond Pedestrian Plan

Focus Area 3 – Neighborhood Routes



To complement key corridors, a complete system of neighborhood routes are proposed along residential streets which have lighter and slower moving traffic, and provide access to local destinations such as

schools and parks. Class III bike routes are most appropriate for these streets, which are relatively narrow and require less separation from auto vehicles. Specifically, bicycle boulevards are the recommended facility for many of these routes, which will facilitate and prioritize bicycle travel through various traffic calming treatments and appropriate traffic controls. These neighborhood routes will be appropriate for bicyclists of all ages and abilities, and ideally, encourage new users to the bicycle network. Neighborhood routes include, but are not limited to:

- Maricopa/ Costa Avenue
- Garvin Avenue
- Roosevelt Avenue
- Nevin Avenue
- Wall/ Central/ Maine Avenue
- 6th/ 7th Street
- Marina Way
- 18th/ 19th Street
- 24th Street
- 29th/ 30th/ 33rd Street
- Wilson Avenue

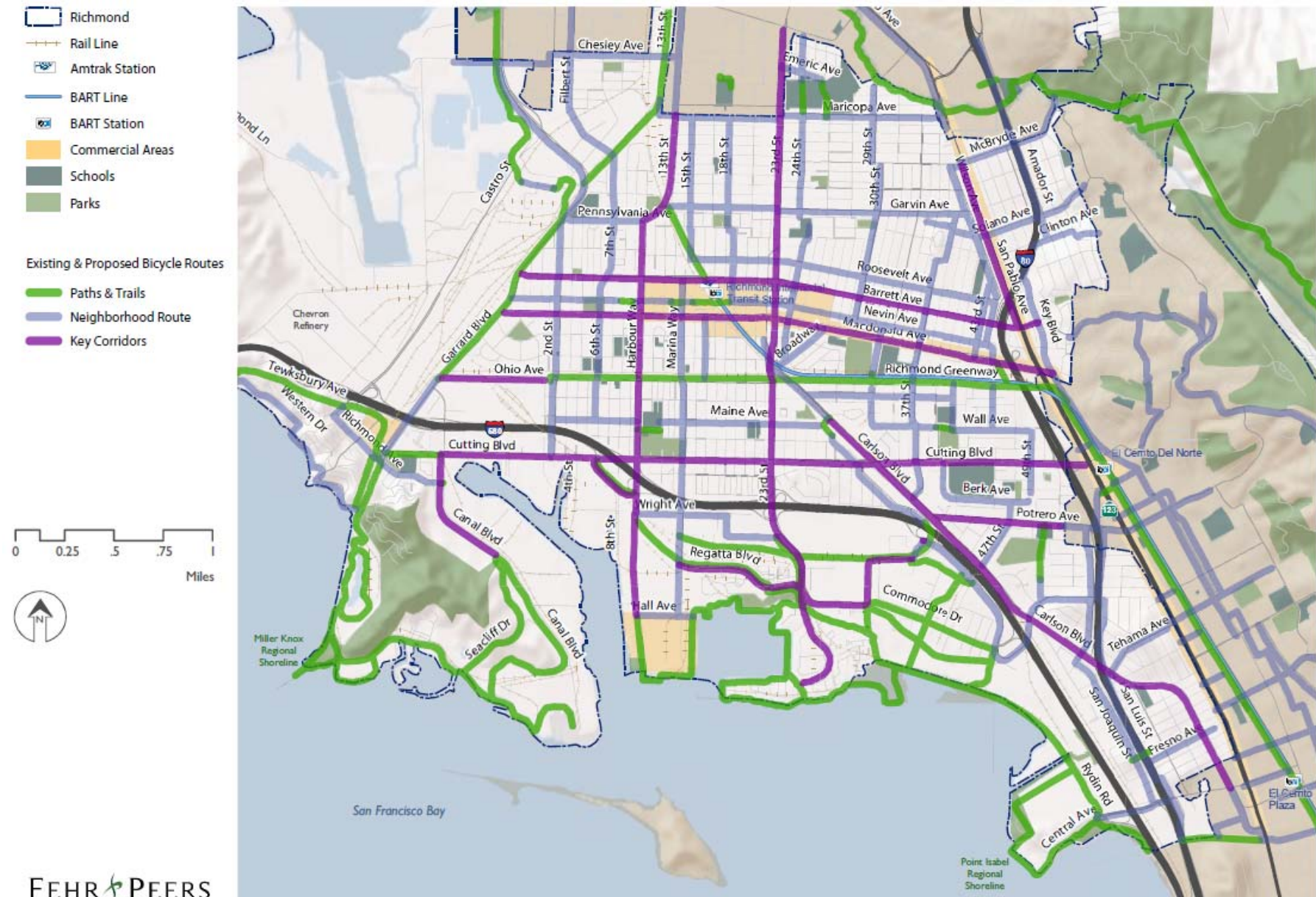
Bicycle Facilities for Neighborhood Routes

The following bicycle-friendly treatments may be considered along neighborhood routes. These treatments are described in detail in the Design Guidelines.

- Traffic calming to reduce vehicle speeds such that they mix well with bicyclists and limit non-local traffic
- Changes to stop controlled Intersections to reduce stops on the bikeway (note that some intersections entirely lack any kind of traffic control. Any such intersections along the bikeway network should be prioritized for improvements.)
- Traffic circles and mini roundabouts
- Curb extensions
- Traffic control at busy intersections
- High-visibility crosswalks
- Landscaping
- Signage & Wayfinding

As shown in the complete table of proposed projects in Appendix A, these routes are connected through a series of secondary on- and off-street segments.

Map 6-4 | Key corridors and neighborhood routes



Focus Area 4: Connecting the west and east spans of the Richmond Greenway

The intersections of Carlson Boulevard/Broadway, the railroad tracks, and 23rd Street/Ohio Avenue comprise one of the most significant barriers on the City's bicycle network. Located in Central Richmond, just south of the Richmond BART Station and Civic Center area, this site is defined by a series of railroad and BART tracks that restrict bicycle and pedestrian access to key destinations, including the Richmond Greenway, Bay Trail, BART Station and Downtown.

The area's current configuration provides poor bicycle and pedestrian access. Both 23rd Street and Carlson Boulevard have fast-moving vehicle traffic and poor sightlines. At the Carlson Boulevard/Broadway intersection, overhead BART tracks are supported by columns that reduce visibility around the intersection, and at-grade railroad tracks are a significant barrier to east-west connections. Additionally, 23rd Street runs below grade in this location, further limiting east-west access.

As the roadway and railroad track configuration is confusing, bicyclists and pedestrians would benefit from signage and wayfinding directing users to surrounding destinations.

The western portion of the Richmond Greenway ends at Ohio Avenue and 23rd Street, where there is little accommodation for bicyclists or pedestrians. To connect to the eastern portion of the Richmond Greenway, users are supposed to travel under the railroad tracks on 23rd Street, and then loop back to the Greenway on Carlson Boulevard. This route is neither direct nor intuitive, and as a result path users have often used an unmarked trail across private property and cross the railroad tracks to Carlson Boulevard. Once at Carlson Boulevard, there is no marked crosswalk or signal in this location for bicycl-

ists and pedestrians to cross safely. Current efforts to fence the railroad tracks may deter people from using the at-grade crossing route, however the suggested route is not viable and vandalism will likely continue to be an issue along the at-grade route.

The eastern portion of the Richmond Greenway ends at Carlson Boulevard, where there is no comfortable access to and from the north. The Greenway entrance lacks a curb cut, so northbound bicyclists ride on the sidewalk, and southbound bicyclists entering the Greenway must cut across several lanes of fast moving traffic. There is also an opportunity to provide a Class I connection along the east side of Carlson Boulevard adjacent to sidewalk, which may require right-of-way acquisition.

In the short-term, the following improvements may be considered:

- ❑ Improve crossings at the Carlson Boulevard/ Broadway/ 22nd Street intersection to create a seamless connection between the Greenway and on-street facilities. Provide a pedestrian/bicycle actuated signal phase to allow Greenway users to cross diagonally across the intersection.
- ❑ Construct a Class I spur path along the east side of Carlson Boulevard from the Richmond Greenway to Broadway. Right-of-way acquisition may be necessary.
- ❑ Install Class II physically separated bike lanes on Carlson Boulevard.
- ❑ Potential lane narrowing or lane reduction on Carlson Boulevard and S. 23rd Street.
- ❑ Install a two-way cycle track adjacent to southbound S. 23rd Street below the railroad tracks. Provide switchback connections to the Greenway at Ohio Avenue on the south end and 22nd Street on the north end.

- ❑ Install a bike lane along the section of 22nd Street that bridges 23rd Street, from the two-way cycle track on S. 23rd Street to the Broadway/ Carlson Boulevard intersection.
- ❑ Install a bike box on 23rd Street at Bissell Avenue to transition bicyclists east. Consider a switchback path that would connect to a two-way cycle track on the 23rd Street frontage road to provide a direct connection between 23rd Street northbound bike lane and the eastern span of the Richmond Greenway.
- ❑ Install wayfinding and signage
- ❑ Improve the Ohio Avenue crossing for bicyclists and pedestrians

In the medium-term, the following improvements may be considered:

- ❑ At-grade bicycle and pedestrian railroad crossing, and associated crosswalk improvements across Carlson Boulevard and 23rd Street to connect the east and west portions of the Richmond Greenway. Right-of-way acquisition may be necessary to provide a pathway connection from 23rd Street to the railroad tracks. Permission from the Public Utilities Commission to construct a new at-grade railroad crossing at this location may be difficult. This improvement should be considered in combination with safety enhancements of other nearby railroad crossings at Carlson Boulevard/Maine Avenue and Carlson/Cutting Boulevard.
- ❑ Install a staggered crosswalk with median refuge across Carlson Boulevard to connect to the railroad crossing

In the long-term, the following improvements may be considered:

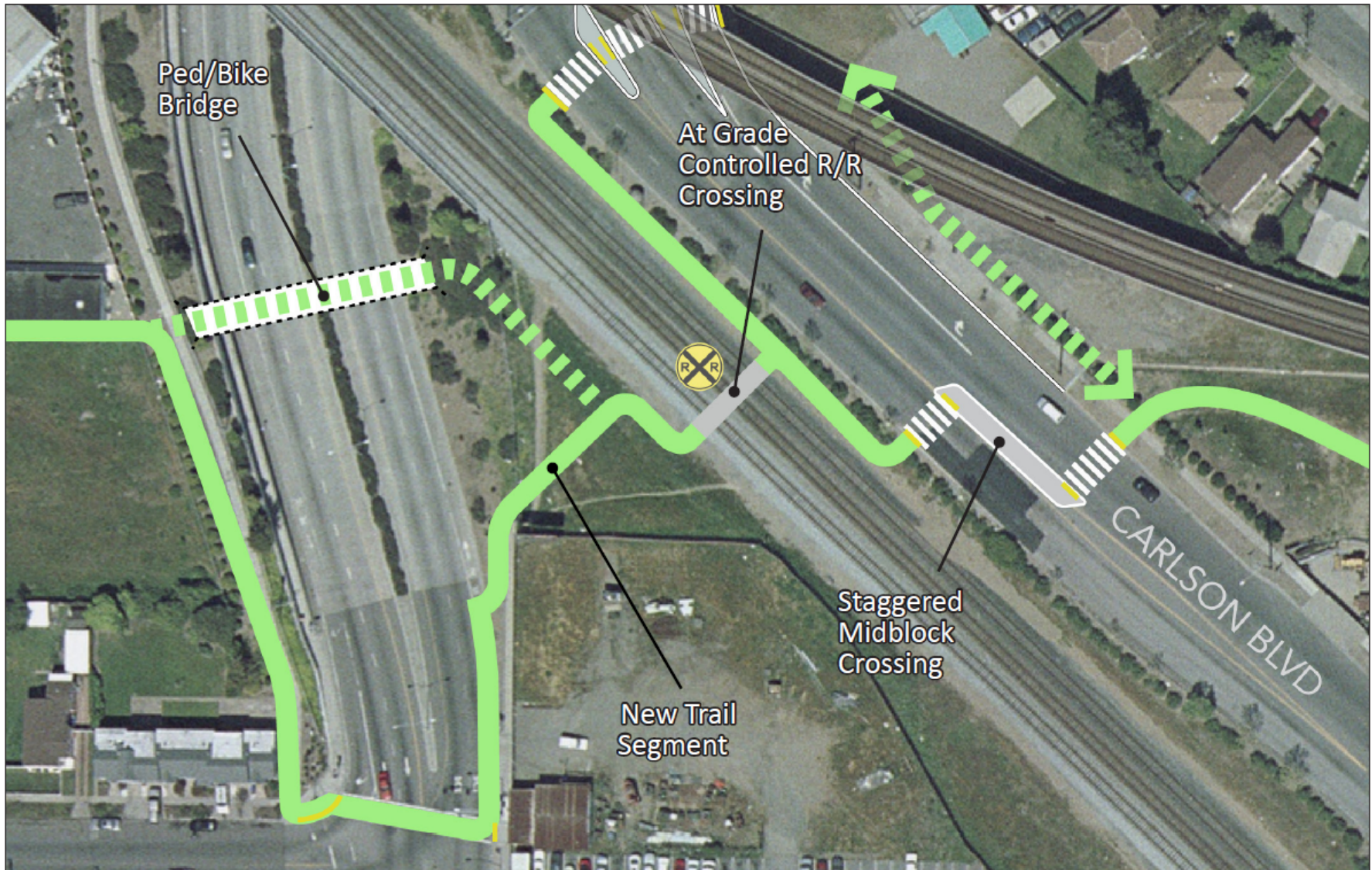
Grade-separated bicycle and pedestrian crossing over 23rd Street to connect the east and west portions of the Richmond Greenway.

Figure 6-4 | Richmond Greenway gap closure
Proposed short, medium-and long-term improvements



Richmond Greenway gap closure – proposed short-term improvements

Richmond Greenway gap closure – proposed mid to long-term improvements



Graphic Source: Richmond Pedestrian Plan

Focus Area 5: Improving safety and access along freeways and through interchanges

Barrett Avenue/ Wilson Avenue/ San Pablo Avenue/I-80 interchange

This area serves as a major interchange for vehicle traffic traveling between San Pablo Avenue (SR 123) and I-80, as well as traveling to Downtown Richmond along Barrett Avenue. This is an area of high volumes of high-speed vehicle traffic, which presents significant challenges to creating an area that is safe and comfortable for bicyclists. Nevertheless, many bicyclists already ride on these streets, demonstrating the demand for improved facilities. In addition, bikeway facilities are proposed for a majority of streets surrounding the interchange, including Wilson, Barrett, Roosevelt and San Pablo Avenue. Engineering and design improvements surrounding the interchange will be critical to completing the bicycle network in this area of the city. Plans to install bicycle lanes along Barrett Avenue as part of a near-term road diet project will greatly improve bicycling conditions along this corridor.

In the short-term, the following improvements may be considered:

- ❑ Improve the pathway between Wilson Avenue and San Pablo Avenue at Roosevelt Avenue:
 - o Realign the path to improve visibility and sightlines
 - o Remove debris and improve landscaping
 - o Widen the path to 10'-12'. Install ADA-accessible curb ramps
 - o Add signage

In the medium- to long-term, the following improvements may be considered:

- ❑ Improve bicycle and pedestrian access at the Barrett Avenue/44th Street intersection

- o Provide bicycle and pedestrian access between the north side of Barrett Avenue and 44th Street
- o Stripe a crosswalk across Barrett Avenue on the west side of 44th Street
- o Move the eastbound vehicle queue back to stop at the new crosswalk
- o Provide a pedestrian/bicycle activated signal with a dedicated phase
- o Make 44th Street south of Barrett Avenue two-way, with access from Barrett Avenue open to bicycles and pedestrian only. This recommendation should be considered in close coordination with local residents.
- o Improve sightlines and install advanced pedestrian crossing signage at the southbound I-80 off-ramp
- ❑ Improvements at the I-80/San Pablo Avenue/Roosevelt Avenue intersection
 - o Install bike lanes on both sides of San Pablo Avenue in coordination with Caltrans. Special care should be taken to design these bike lanes to safely facilitate vehicles merging across bike lanes as they enter and exit I-80 from San Pablo Avenue.
 - o Consider removing the through lane from northbound I-80 off-ramp to northbound on-ramp and installing a median to protect cyclists heading north on San Pablo Avenue. Preclude the straight-across movement to the on-ramp for all except possibly emergency vehicles (aided by lights and sirens to make this occasional movement safely).
 - o Consider squaring up on-ramp configuration to slow traffic and lower the exposure of the bicyclists and pedestrians crossing there.
 - o On the approach to the northbound I-80 on-ramp from San Pablo Avenue, consider eliminating the double right turn, and create room for a through bike lane, to the left of the right-turn lane.

Figure 6-5 | Barrett Avenue/ Wilson Avenue/ San Pablo Avenue/I-80 interchange; proposed short- and long-term improvements



Graphic Source: Richmond Pedestrian Plan

Reduce Barrett to 2 travel lanes, with center median/turn lane and bike lanes

Extend curb, close left lane, and make 44th St 2-way

Improve underpass conditions - widen sidewalks, add illumination, beautify walls and facings

Focus Area 6: Improving access to the Bay Trail and waterfront

Marina Bay Parkway/I-580 interchange

Bicycle access between downtown Richmond and the waterfront is severely impeded by I-580, which connects the Richmond-San Rafael Bridge to I-80. While the freeway itself is a linear barrier and cuts off many residential streets to the north, the I-580 freeway interchanges also present challenges to bicycle safety and comfort that may deter people from bicycling to and from destinations along the waterfront, including the Bay Trail. Marina Bay Parkway, itself a wide collector street with fast moving vehicle and truck traffic, currently lacks any bicycle facilities. However, with improved accommodation for both bicyclists and pedestrians, this interchange could provide access to important amenities and destinations to the south, including the new Officer Moody Class I path, the existing Bay Trail system, and several commercial and residential areas. Heading north on 23rd Street, access to the Richmond Greenway, downtown Richmond, Civic Center area and the Richmond Intermodal Transit Station should also be improved.

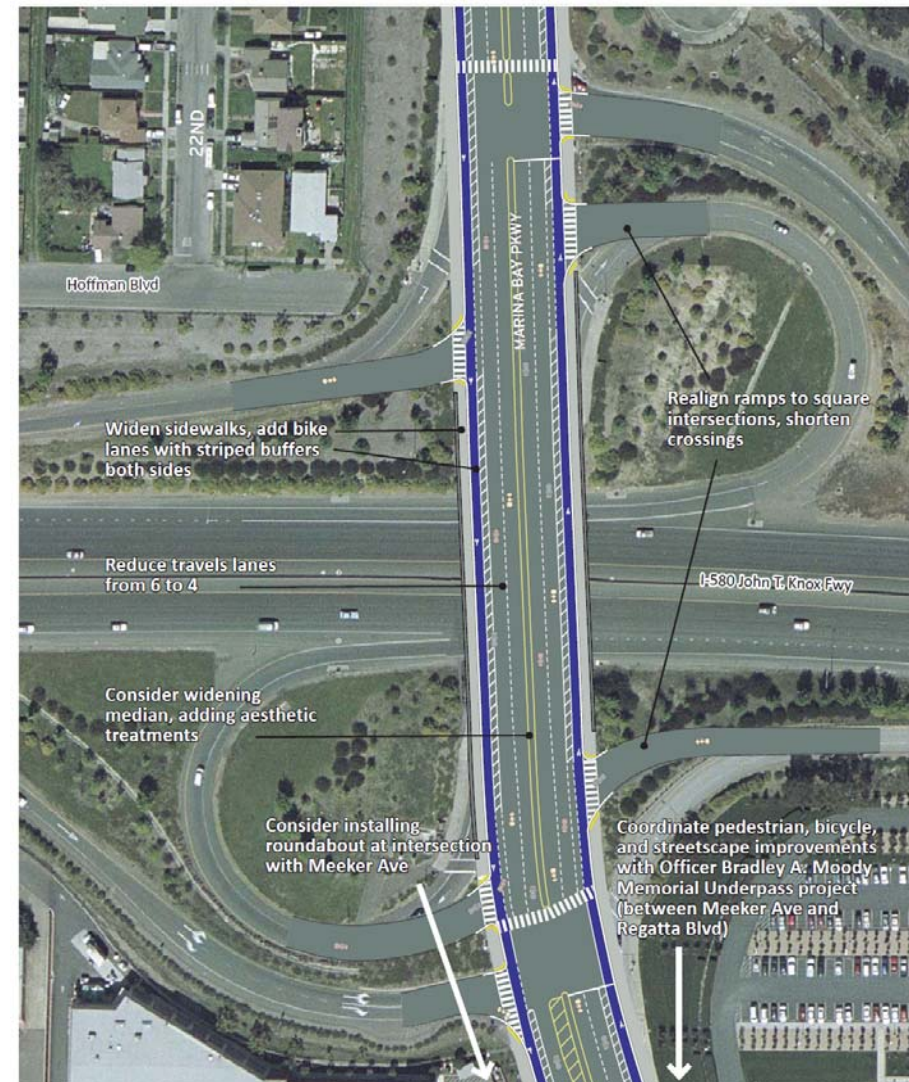
In the short-term, the following improvements may be considered:

- ❑ Stripe and sign bike lanes along Marina Bay Parkway. Connect bike lanes to the Officer Moody Class I path at Meeker Avenue/Marina Bay Parkway intersection.
- ❑ Consider narrowing or removing travel lanes on South 23rd Street to provide a bicycle and pedestrian connection to downtown Richmond.
- ❑ Stripe crosswalks at freeway ramps for pedestrian and bicycle travel across ramps. Locate crosswalks for optimal sightlines and convenience to pedestrians and bicyclists

In the medium- to long-term, the following improvement may be considered:

- ❑ Square the freeway off-ramps to slow speeds and improve sightlines between drivers and bicyclists/pedestrians

Figure 6-6 | Marina Bay Parkway/I-580 interchange
Proposed short- and long-term improvements



Graphic Source: Richmond Pedestrian Plan

Focus Area 7 –Bay Trail Improvements at the Plunge

There are several opportunities to improve connections to the existing and proposed Bay Trail in Point Richmond, particularly around the Plunge and tunnel entrances in Point Richmond.

As a short-term improvement, a curb ramp should be installed close to the tunnel entrance so that bicyclists can access the newly widened multi-use path within the tunnel.

In addition, the recent sidewalk widening adjacent to the Plunge could be further retrofitted to accommodate a Class I pathway. The existing roadway is 44 feet, and the sidewalk is seven feet wide with an additional three feet to the building front where exit stairs are located. By reallocating six feet of right-of-way from the adjacent roadway to the sidewalk area, sufficient room can be provided to meet the minimum requirement for a Class I path and maintain enough width for travel lanes and on-street parking. As shown in the following renderings, the proposed pathway could have a landscaped buffer and signage to warn users of the exit stairs where it impedes the path of travel.

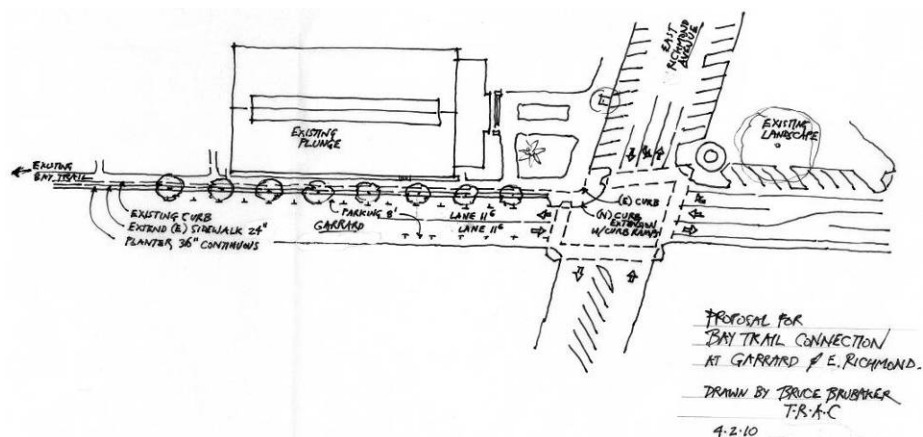
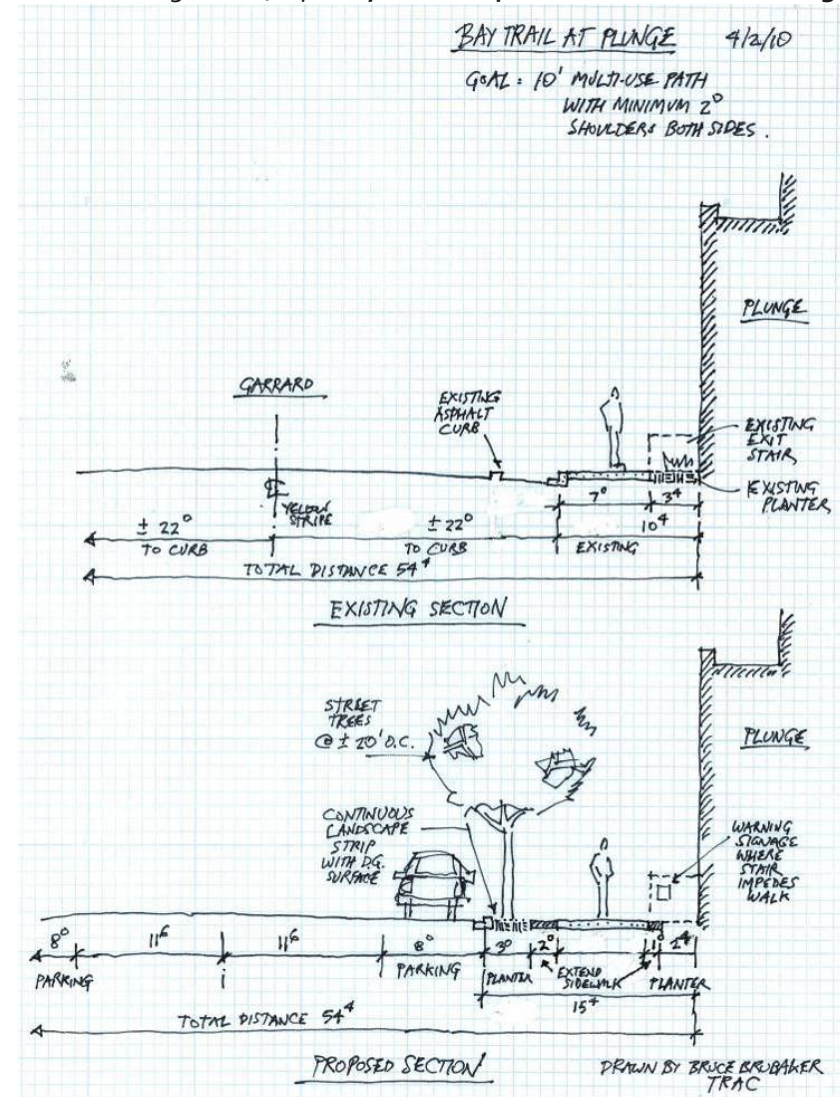


Figure 6-7 | Bay Trail improvements at the Plunge



Graphic Source: Bruce Brubaker, TRAC

Ongoing Improvements

The proposed bicycle network improvements for Richmond also include several projects that may be implemented immediately, or prioritized as part of ongoing City efforts. These include:

- **Repaving** – Streets designated as bikeways should be prioritized for repaving. Specifically, sections of Cutting Boulevard, Carlson Boulevard, Harbour Way and 7th Street have poor pavement conditions such as cracked asphalt and uneven lip between the roadway and gutter. The City Engineering Services Department maintains a Pavement Rehabilitation List of Streets.
- **Bicycle Detection at Signalized Intersections** – Signalized intersections along bikeways should have functioning loop detection for bicyclists. The City should develop a citywide program for installing and maintaining bicycle loop detectors, as described in the Design Guidelines. The following intersections have been identified as areas that currently have vehicle loop detection that do not detect bicyclists:
 - o Ohio Avenue/23rd Street
 - o Macdonald Avenue/16th Street BART entrance
 - o Ohio Avenue/ Garrard Avenue (in addition, the signal timing at this intersection does not provide even green time for a bicyclist to cross before the light turns.)
 - o Cutting Boulevard/ Canal Boulevard
 - o Regatta Boulevard/ Marina Bay Parkway
 - o Harbour Way South/ Hoffman Boulevard
 - o Marina Bay Parkway/ Department of Public Health complex exit
 - o Intersections along Barrett Avenue
- **Street Sweeping** – Roadway debris such as glass, dirt and rocks are frequently blown into bikeways and can be a major deterrent to bicycling. Underpasses such as 23rd Street under Carlson Boulevard, Macdonald Avenue and Barrett Avenue under the

Bart/Amtrak tracks, and 37th Street by the Courthouse are particularly problematic areas. The City should develop a bicycle network maintenance plan that includes regular sweeping so that all bike-ways continue to operate optimally.

- **Richmond Greenway Maintenance and Operations** – The Richmond Greenway is the backbone of the City's existing bikeway network, and has the potential to help transform surrounding neighborhoods for the better. However, issues related to vandalism and theft must be resolved in order for it to achieve its full potential. The City, in collaboration with Rails to Trails, should seek grant funding for a focused study on construction practices and materials, and maintenance and operations to help the City deter crime and vandalism.
- **Bicycle Parking** – Providing secure short- and long-term parking at key destinations is an integral part of the City's bikeway system. The following chapter outlines a series of recommendations for installing bike parking in Richmond.

Regional Coordination

Many of Richmond's proposed bikeways provide access to neighboring jurisdictions where facilities are already existing or proposed. The City should work with these jurisdictions to ensure a continuous and connected bicycle network throughout West County. In particular, the San Pablo Dam Road/I-80 interchange in the City of San Pablo, and the Central Avenue/I-580/I-80 interchanges at the Richmond/Albany border are significant barriers to bicycle travel to and from Richmond.

7 . Bicycle Parking

This section addresses BTA requirement (d): “A map and description of existing and proposed end-of-trip bicycle parking facilities. These shall include, but not be limited to, parking at schools, shopping centers, public buildings, and major employment centers”, and (f): “A map and description of existing and proposed facilities for changing and storing clothes and equipment. These shall include, but not be limited to, locker, restroom, and shower facilities near bicycle parking.”

INTRODUCTION

After on- and off-street bikeways, bicycle parking is the most important element of a community’s bicycling system. Parking is a low-cost yet effective way to encourage cycling and improve the functionality



The electronic lockers at Richmond’s Civic Center are a type of Class I parking facility

of a bikeway network; it reduces the threat of theft, makes bicyclists feel welcome and increases the visibility of bicycling.

Bicycle parking facilities may be classified either as long-term (also known as Class I) or short-term (Class II).

Class I parking is meant to be used for more than two hours and is typically used by employees at work, students at school, commuters at transit stations or park-and-ride lots and residents at home. Class I facilities are secure and weather-protected; examples include bike

lockers and “bicycle corrals” (fenced-in areas usually secured by lock and opened by keys provided to users).



Bike racks at the Richmond BART Station are a type of Class II parking facility

Class II, or short-term parking, is meant for visitors, customers at stores and other users who normally park for less than two hours. The most common example of Class II parking is bicycle racks. Racks should be installed according to manufacturers’ guidelines; be

located in secure, well-lighted and highly visible areas; be located as close as possible to the main entrance and no farther from the entrance than the nearest non-handicapped car parking space; be anchored to the ground; and allow for the locking of both the frame and wheels of a bicycle. Guidance on recommended bicycle parking facility types and proper installation is provided in the Design Guidelines.

EXISTING PARKING FACILITIES

The City of Richmond does not require bicycle parking at employment sites or as part of new development projects; it also lacks formal standards, guidelines or recommendations related to bicycle parking. Unlike some other jurisdictions in the Bay Area, the City also does not have a program to install bicycle racks on request on sidewalks, at community facilities or at private sites. Despite these shortcomings, bicycle parking has sprung up in many places throughout the city, in large part through the initiative of individual agencies, organizations

and businesses. The following is a list and map of public locations in Richmond where bicycle parking—racks, in almost every case—can be found:

Civic Center

- City Hall
- Main Library
- Memorial Auditorium
- Richmond Art Center

Parks

- Bay Vista
- Booker T. Anderson Jr.
- Boorman
- Central Park
- Hilltop
- Hilltop Lake
- Lucretia Edwards
- Nevin
- North Richmond Ball
- Olinda School Field
- Parchester
- Richmond Greenway (on east side of Carlson and at access at South 42nd Street)
- Shields-Reid
- South Side
- Vincent

Other community facilities

- Bayview Branch Library
- Contra Costa County Employment and Human Services Department building at 1305 Macdonald Avenue
- May Valley Community Center
- Point Richmond Community Center

- Richmond Swim Center
- Richmond Recreation Complex
- Souper Center
- West Side (Point Richmond) Branch Library

Transit

- Hilltop Park & Ride lot
- Richmond BART station (downstairs and at the transit station building)

Employment and commercial

- Kaiser Permanente Medical Center
- Pacific East Mall
- Rubicon Employment Services
- Parking lot on northwest corner of Macdonald and San Pablo avenues

Streets and sidewalks

- Macdonald Avenue:
 - at Harbour Way (northeast corner)
 - between Harbour Way and 11th Street (north side)
 - between 11th and 12th Streets (north side)
 - at 12th Street (northeast and northwest corners)
 - between 12th and 13th Streets (north side)
 - at Marina Way (northwest corner)
 - between Marina Way and 15th Street (south side)
 - at 15th Street (southeast corner)
 - at 16th Street (southeast corner)
 - at Civic Center Street (southwest corner)
 - Nevin Avenue at 5th Street (south side)

OTHER SUPPORT FACILITIES

For commuters who dress formally, travel longer distances or bicycle during wet or hot weather, the ability to shower and change clothing can be as important as bicycle storage. Showers and changing rooms are provided for employees in West Contra Costa County at a number of large office parks, large office buildings and buildings with fitness centers. Currently, there are no publicly available changing and storing facilities in Richmond, although several members-only fitness centers provide these amenities. The City should incorporate showers and changing rooms in the construction of new administrative buildings and should consider requiring developers of employment centers of more than a certain size—say, 50,000 square feet of usable space—to do the same.

Map 7-1 | Bicycle parking locations



RECOMMENDATIONS FOR BICYCLE PARKING

There are three strategies that the City of Richmond can adopt to increase the provision of bicycle parking: install parking itself on City-controlled property; collaborate with other public agencies on installation at locations controlled by them; or require private-property owners—including developers, employers, homeowners' associations and building owners—to provide parking on their property. (These are the same strategies that are used, at much greater expense, to provide car parking.) Below are several recommendations for implementing these strategies.

❶ Install bicycle parking at public facilities

Install both long- and short-term bicycle parking, as appropriate, at all City-owned and -operated facilities. Such facilities include parks, playgrounds and other recreational facilities, community centers, senior centers, and office buildings and other workplaces for City staff. Bicycle parking should always be incorporated in the development of new City facilities, while existing facilities that lack bicycle parking may be retrofitted easily and inexpensively. Racks should also be installed at appropriate locations to serve newly constructed bicycle facilities. In addition, the City should collaborate with the West Contra Costa Unified School District to ensure that all schools provide bicycle parking not only for students but also for faculty and other staff. 511 Contra Costa—the transportation demand management program sponsored by all the county's local jurisdictions—provides free bicycle racks and lockers for public buildings as well as for retail centers and private employment sites.

❷ Institute a program to install sidewalk racks on request

Institute a program to install bicycle racks at public sidewalk locations requested by the public online, by mail or through a phone hotline. (Inverted “U”-type racks, which could be produced locally, bolted into the sidewalk are generally the best option.) The program could begin by prioritizing locations in the downtown, commercial areas and other key destinations or requests by merchants for parking in front of their stores. Ultimately, there should be bike racks on both sides of every block of all commercial corridors in the city. In particular, racks should be located in front of food stores, restaurants, delis, drugstores, neighborhood-serving retail stores and other business that people visit frequently and for short periods of time, and that are often located near people's homes.

The City of Oakland has a well-established sidewalk rack program that could be used as a model. Anyone can request a free rack be placed on public property by using an online form, downloading and mailing the form, or calling the city. Since 1999, that program has installed almost 1,400 racks (and lockers) in commercial districts throughout the city, using sales-tax funds and various other funding sources.

► **City of Oakland's "CityRacks" bicycle parking program:**
www.oaklandbikes.info/Page127.aspx#racks

❸ Install bicycle parking at priority AC Transit bus stops

In 2009 AC Transit conducted a study to identify its bus stops that have a high latent demand for bicycle parking and to provide guidelines for the design and installation of secure and accessible

parking at those locations. Using an index model of bicycle parking demand, the study identified 39 priority bus stop locations for bicycle parking in Richmond and ranked them as follows:

1. Richmond Bart Station
2. San Pablo Ave: Bayview Ave
3. San Pablo Ave: Stockton Ave
4. San Pablo Ave: Manila Ave
5. Macdonald Ave: 7th St
6. Macdonald Ave: 12th St
7. Cutting Blvd: S 41st St
8. Cutting Blvd: S 38th St
9. Central Ave: Belmont Ave
10. 22nd St: Bissell Ave
11. Macdonald Ave: Marina Way
12. Macdonald Ave: 21st St
13. Macdonald Ave: 13th St
14. San Pablo Ave: Garvin Ave
15. Macdonald Ave: 25th St
16. San Pablo Ave: Garvin Ave
17. Macdonald Ave: Harbour Wy
18. San Pablo Ave: Panama Ave
19. San Pablo Ave: Lincoln Ave
20. Filbert St: Duboce St
21. Filbert St: Chesley Ave
22. Cutting Blvd: S 49th St
23. Cutting Blvd: S 45th St (Kennedy Sr High School)
24. Cutting Blvd: S 37th St
25. Cutting Blvd: S 35th St
26. 23rd St: Rheem Ave
27. 23rd St: Downer Ave
28. 23rd St: Alfreda Blvd (Richmond High School)
29. Marina Wy: Nevin Ave
30. Macdonald Ave: 1st St

31. 3rd St: Grove Ave
32. San Pablo Ave: Schmidt Lane
33. Macdonald Ave: Civic Center Plaza
34. Macdonald Ave: 37th St
35. Macdonald Ave: 33rd St
36. Macdonald Ave: 31st St
37. Macdonald Ave: 27th St
38. Macdonald Ave: 23rd St

Most, if not all, of these locations are under the jurisdiction of the City of Richmond. At such locations, the installation and maintenance of bicycle parking facilities is the responsibility of the City. The City should use the results of the study report to prioritize bus stop locations for improvements and, in collaboration with AC Transit, to plan for the appropriate quantity, installation and maintenance of bicycle parking facilities.

④ Adopt an ordinance to require bike parking as part of development projects

Adopt an ordinance requiring that both secure and weather protected long- and short-term bicycle parking, as appropriate, be included in all new residential, commercial, office, institutional and industrial development projects and remodels meeting certain size criteria. The City of Richmond may want to use the Oakland bicycle parking ordinance as its model. Oakland's ordinance contains requirements for the design, location and installation of bicycle parking facilities and minimum number of parking spaces. The required number of spaces varies according to the project's land use or activity, as categorized by the City's planning code (Chapter 17.117). The table below includes Oakland's standards for long- and short-term parking-space for the most common types of development projects; where proposed land uses do

not conform to the descriptions in the table, one bicycle parking space should be provided for every 20 vehicle parking spaces.

<i>Type of activity</i>	<i>Long-term</i>	<i>Short-term</i>
One-family dwelling	No spaces required	No spaces required
Multifamily dwelling without private garage for each unit	1 space for each 4 dwelling units. Minimum requirement is 2 spaces.	1 space for each 20 dwelling units. Minimum requirement is 2 spaces.
General retail sales	1 space for each 12,000 s.f. of floor area. Minimum requirement is 2 spaces.	1 space for each 5,000 s.f. of floor area. Minimum requirement is 2 spaces.
General food sales (grocery stores, restaurants)	1 space for each 12,000 s.f. of floor area. Minimum requirement is 2 spaces.	1 space for each 2,000 s.f. of floor area. Minimum requirement is 2 spaces.
Office	1 space for each 10,000 s.f. of floor area. Minimum requirement is 2 spaces.	1 space for each 20,000 s.f. of floor area. Minimum requirement is 2 spaces.

The Oakland ordinance also contains requirements for shower and locker facilities in very large commercial projects; considerations for granting variances under the ordinance; and a provision for reducing the required number of off-street car parking spaces based on the number of bike parking spaces provided in excess of the requirements.

► **Parking webpage of the city of Oakland's bicycle program:**

www.oaklandbikes.info/Page127.aspx



5 Consider requiring valet bike parking at large events

Consider requiring sponsors of large public events, such as concerts and fairs, to provide and publicize attended, or valet, bicycle parking in secure, fenced-in "corrals" as a way to mitigate the transportation impacts of such events. Valet bike parking would not only be a welcome service to regular cyclists but also encourage others to ride instead of drive. Event sponsors would need to set aside some space for the corral and use either paid staff or volunteers to park and retrieve the bikes. The East Bay Bicycle Coalition provides valet bike parking as a public service at various community events throughout the year in Contra Costa.

⑥ Seek opportunities to design and fabricate bicycle racks within the City

To support local jobs and economic development within Richmond, the City should take advantage of opportunities to employ local metalworkers to manufacture bicycle racks for installation throughout the City.

8 . Collisions

INTRODUCTION

While traffic collisions can affect anyone, they have a disproportionate impact on bicyclists, who along with pedestrians are the most vulnerable users of the transportation system. Data on collisions involving bicyclists can help planners and other decision-makers identify specific locations and support programs—safety, education or enforcement—on which to focus efforts. The data presented in this section comes from the California Highway Patrol’s Statewide Integrated Traffic Records System (SWITRS), a database of traffic collisions as reported to and collected by local police departments and other law enforcement agencies across the state.

We examined data for the five-year period from 2004 to 2008, 2008 being the latest full year for which data is available. Because SWITRS consists only of reports taken by officers in the field, the incidents in

the database represent only a portion of all collisions; it also means that the incidents in SWITRS are more likely to be serious ones, since minor collisions are less likely to be reported to a police officer and lead to police response. Despite these limitations, SWITRS remains the most comprehensive source of information about traffic collisions involving bicyclists not only in Richmond but throughout most of the state.

When reading this section, it is worth keeping in mind that most bicycle collisions do not involve motor vehicles. Hospitalization data have shown that a majority of bicycle injuries involve collisions with stationary objects, other cyclists or pedestrians. Such collisions are unlikely to be included in SWITRS (for a number of reasons that are beyond the scope of this section) and are therefore not reflected in our analysis.

► **CHP's Statewide Integrated Traffic Records System (SWITRS):**

http://www.chp.ca.gov/switrs/index_menu.html

FATALITIES AND INJURIES

For the 2004–2008 period, SWITRS reports precisely 100 traffic collisions in Richmond involving bicyclists. These collisions resulted in six bicyclists killed and 100 injured (see next table). Annual fatalities ranged from 1 to 3, with an annual average of 1.2; injuries ranged from 11 to 27, with an annual average of 20.0. The numbers show no discernible trend between 2004 and 2008 in the number of bicyclists killed or injured. For context, the numbers for all of Contra Costa County bicycle collisions are also given. The county, which has a population roughly ten times greater than Richmond's, had 23 bicycle fatalities and 1,193 injured during the same time period. In Richmond, bicycling accounts for less than 2 percent of primary work trips and commuting (see Chapter 4, "Background Conditions"). However, in 2004–2008 bicyclists made up over 15 percent of all traffic fatalities in the city (6 out of 39).

Table 8-1 | **Bicyclists killed and injured (2004–2008)**

	<i>Richmond</i>		<i>Contra Costa County</i>	
	<i>Killed</i>	<i>Injured</i>	<i>Killed</i>	<i>Injured</i>
2004	1	23	4	228
2005	0	27	1	247
2006	3	11	9	213
2007	0	16	2	243
2008	2	23	7	262
Total	6	100	23	1,193
Annual average	1.2	20.0	4.6	238.6

The following is comparative collision data from the California Office of Traffic Safety. It shows that in 2008 Richmond ranked 36th out of 52 California cities with a similar population size in the number of bicycle collisions.

Table 8-2 | **Traffic collisions and rankings (and percentile), 2008**

<i>Type of collision</i>	<i>Victims killed and injured</i>	<i>Ranking by daily vehicle miles traveled (of 52 cities)</i>	<i>Ranking by average population (of 52 cities)</i>
Bicyclists	24	37 (67)	36 (65)
Bicyclists < 15	2	50 (91)	52 (95)

Source: California Office of Traffic Safety,
www.ots.ca.gov/Media_and_Research/Rankings/default.asp

COLLISIONS HOT SPOTS

As the map of collision locations on the next page shows, the vast majority of bicycling fatalities and injuries occurred in an area bounded roughly by Cutting Boulevard to the south, Garrard Boulevard/Richmond Parkway to the west, Costa Avenue/Maricopa Avenue to the north and the city limits to the east. While this area makes up only a third or so of Richmond's total land mass, it should not be surprising that most bicycling fatalities and injuries occur here: this is the area of the city where most bicycling occurs; it is flat and compact; encompasses most of the population, contains many of the city's key destinations (including the BART station, Civic Center and Kaiser Permanente Medical Center) and has a higher percentage of zero-car households.

Even within the concentrated area mentioned above, there appear to be four main "hot spot" corridors. Roughly, these are:

- 13th Street/Harbour Way between Hellings and Barrett avenues, and west on Barrett Avenue to 2nd Street
- Macdonald Avenue between 24th and 2nd streets and again between 39th Street and San Pablo Avenue
- 22nd and 23rd streets and adjacent streets between Costa and Potrero avenues
- Cutting Boulevard between 41st Street and Marina Bay Parkway

While the hotspots listed above, and central Richmond in general, experience most of the bicycle collisions, it should not be assumed that these places are the riskiest or most hazardous for bicyclists. When evaluating the safety of an area, the number of collisions tells only part of the story. For a more meaningful evaluation, the data need to be adjusted for the number of bicycle commuters or of bicycling trips in the area, to account for bicyclists' "exposure." It is possible—indeed,

likely—that the places mentioned above have the most collisions simply because they also have the highest bicycle volumes. If that is the case, the risk of any given bicyclist being hit by a motor vehicle might even be lower in an area that experiences more collisions. Unfortunately, at this time there is no reliable systematic method for estimating bicycle exposure and, therefore, the relative safety of an area.

Map 8-1 | Bicycle-vehicle collisions, 2004-2008



Other factors

Besides raw numbers and location, there are other ways in which it is useful to analyze collision data involving bicyclists. For example, of the 100 collisions involving bicyclists in Richmond between 2004 and 2008, 60 took place at intersections; the rest took place on straightaways. Other relevant factors are considered in the tables below. They include party at fault (Table 8-3), primary collision factor (Table 8-4), violation (Table 8-5), time of day (Table 8-6) and bicyclist's age (Table 8-7).

The table below, shows that the bicyclist was found to be at fault almost 60 percent of the time in the Richmond collisions and almost twice as often as the driver. This strongly suggests the need for more training and education of bicyclists on safe riding techniques and, more generally, on their responsibilities on the road. Of course, since drivers were at fault more than 30 percent of the time, more education of drivers on the rights of bicyclists should also be part of the city's efforts to promote traffic safety.

Table 8-3 | Collisions by party at fault

Bicyclist	59
Driver	31
Other / not stated	10
Total	100

Table 8-4 breaks down the Richmond collisions by "primary collision factor" (in the reports, "R-O-W ped" is used to refer not only to pedestrians' right-of-way but also to bicyclists'). By far the most common primary collision factor was the bicyclist riding on the wrong side of the street. This is followed by "R-O-W auto" (the reports' citation of

this factor is confusing: depending on which party was at fault, it could mean either the bicyclist not yielding to the driver's right-of-way or the driver observing his or her right-of-way improperly). The third most common primary collision factor was failure to stop at a sign or signal. These three factors accounted for almost 70 percent of collisions.

The numbers suggest that targeted efforts to reduce the incidence of wrong-way bicycle riding promise the greatest reduction in bicycle-related collisions. Such efforts could consist of training and education on riding in the direction of traffic or of engineering fixes that address bicyclists' real or perceived need to ride on the wrong side of the street. An example of an engineering solution would be to convert a one-way street used as a bike route into a two-way street.

Table 8-4 | Collisions by primary collision factor

	<i>Bicyclist at fault</i>	<i>Driver at fault</i>	<i>Other at fault / not stated</i>	Total
Wrong side	29	1	1	31
R-O-W auto	11	9	1	21
Stop sign / signal	11	4	--	15
R-O-W ped	--	6	--	6
Improper turn	3	4	--	7
Improper pass	--	3	--	3
Other	3	2	2	7
Not stated	2	2	6	10
Total	59	31	10	100

The table below lists the violations of the California Vehicle Code related to the primary collision factors.

Table 8-5 | Collisions by California Vehicle Code violation

21650.1 (bicycle riding on wrong side of the street)	16
21202 (bicyclist not riding as close as practicable to the right-hand curb)	12
22450 (not stopping at stop sign)	11
22107 (unsafe or improper turning)	7
21802 (not yielding to other stopped vehicle at stop sign)	8
21950 (not yielding to pedestrian at crosswalk)	6
21453 (not stopping at traffic light)	5
21804 (not yielding when entering or crossing a street)	5
21800 (not yielding to vehicle in an intersection)	4
21801 (not yielding to oncoming vehicle when turning)	3
Other	12
Not stated	11
Total	100

Table 8-6 categorizes the collisions by the time of day in which they occurred. Almost three quarters of collisions occurred in the afternoon and evening. The fact that almost 40 percent of collisions occurred in the afternoon suggests that many bicyclists in Richmond ride outside of the regular morning and evening commute hours.

Table 8-6 | Collisions by time of day

Morning (6:00–11:59 am)	22
Afternoon (12:00–4:59 pm)	37
Evening (5:00–9:59 pm)	37
Night (10:00 pm–5:59 am)	3
Unknown	1
Total	100

Table 8-7 lists the bicyclists involved in collisions by age group. (Tables 8-6 refer to collisions involving bicyclists, whereas Table 8-7 refers to the bicyclists involved. It totals more than 100 because some collisions involved more than one bicyclist.) The age range of the bicyclists was 5–77. A majority were in the 35–64 age group and almost three quarters were between 18 and 64 years old. This strongly suggests the need for more bicycle training and education oriented toward adults.

Table 8-7 | Bicyclists involved in collisions by age group

0–12	15
13–17	9
18–34	23
35–64	51
65 and older	2
Unknown	3
Total	103

CONCLUSIONS

Below are key findings and conclusions related to our analysis of bicycle collision data:

Trend:

The numbers of bicyclists killed or injured in Richmond between 2004 and 2008 show no discernible trend. Fatalities spiked from zero in 2005 to three in 2006 but dropped back to zero in 2007. The number injured dropped significantly from 27 to 11 between 2005 and 2006 but has since crept up to 23, the level at which it was in 2004.

Hot spots

The vast majority of bicycling fatalities and injuries occurred in central Richmond, and four collision hot spots have been identified. These are not necessarily the most hazardous places for cyclists in relative terms, once exposure is taken into account; they are, however, the most dangerous in terms of absolute numbers of collisions, fatalities and injuries. For this reason, collision hot spots should be prioritized for physical improvements to increase bicycling safety. The plan chapter on the bicycle network determines the types of improvements that are best for various streets while the chapter on implementation establishes priorities among these improvements. The location of collision hotspots, and bicycling safety in general, were crucial considerations in the process to select and prioritize improvements.

Party at fault and primary collision factor

Bicyclists were found to be at fault in almost 60 percent of the collisions. By far the most common primary collision factor was wrong-way bicycle riding. Consistent with this, the most common violation was bicycle riding on the wrong side of the street; this was followed

by not riding as close as practicable to the right-hand curb and not stopping at the stop sign (this one is applicable to both bicyclists and drivers). The data strongly suggests the need for more training and education of bicyclists on safe riding techniques, especially on riding in the direction of traffic. It also suggests the need for more motorist education on dealing with bicycles in traffic. The plan chapter on support programs will recommend education and law-enforcement programs—or efforts within existing programs—to promote safer bicycling.

Time of day and bicyclists' age

Almost three quarters of collisions occurred in the afternoon and evening, evenly split between the two periods. The fact that almost 40 percent of collisions occurred in the afternoon suggests that many bicyclists in Richmond ride outside of the regular morning and evening commute hours. A majority of bicyclists involved in collisions were in the 35–64 age group and almost three quarters were between 18 and 64 years old. This strongly suggests the need for more bicycle training and education oriented toward adults. The plan chapter on support programs will incorporate suggestions for safety, education and law-enforcement efforts that target different age groups and types of bicyclists.

RECOMMENDATIONS

Collision trends evolve over years rather than months, so we do not suggest conducting an analysis of the data as thorough as this one on an annual basis. However, this analysis should be thoroughly updated at least every five years. In the meantime, we recommend several monitoring and reporting actions related to bicycle collisions that should be conducted annually. (As mentioned in the previous section,

other plan chapters will include recommendations on physical improvements and support programs.)

These recommendations are consistent with Chapter 14.08 of the Richmond Municipal Code, which requires the Police Department to maintain traffic collision reports; share such reports with the Public Works Department; and submit annual traffic safety reports to the City Council containing not only raw collision information but also “[t]he plans and recommendations of the [uniform division of the Police Department] for future traffic safety activities.” Unless indicated otherwise, our recommendations are directed at the Richmond Police Department. Again, the recommended actions should be conducted annually.

SWITRS reports

- ❑ Obtain standardized SWITRS reports for collisions in Richmond involving bicyclists for the latest available calendar year (SWITRS data is typically seven months behind the current date).
- ❑ Share the reports with the Public Works Department and the Community & Economic Development Department.
- ❑ Make the reports publicly available on the City’s website, both as PDFs and as database-importable data, ideally in a new section dedicated to bicycle collisions.
- ❑ Maintain publicly available reports online covering at least the previous five years (start out by making available reports for 2004–2008).

Trends

- ❑ Compare the numbers of bicycle collisions, fatalities and injuries for the previous five years; look for significant or consistent increases or decreases in the numbers.

- ❑ If any trends or significant changes are observed, hold a meeting with engineering and planning staff from the Public Works and Community & Economic Development departments to discuss possible causes and brainstorm potential solutions.
- ❑ Include information about trends, causes and solutions in the annual traffic safety report to the City Council.
- ❑ Make the annual traffic safety reports publicly available on the City’s website.

Hot spots

- ❑ Using SWITRS data, create a map of the locations of collisions involving bicyclists for the previous five years; on the map, differentiate collisions involving fatalities, injuries and neither fatalities nor injuries.
- ❑ Share the maps with the Public Works Department and the Community & Economic Development Department.
- ❑ Make the maps publicly available as PDFs on the City’s website, ideally in the same section as the SWITRS reports.
- ❑ Examine the maps for hot spots, or concentrations of collisions; look for a string of collisions on the same street, for a cluster at or near the same intersection or for a cluster on several nearby street blocks.
- ❑ If a hot spot is found that is not mentioned or is not visible on the map in this chapter, hold a meeting with engineering and planning staff from the Public Works and Community & Economic Development departments to discuss possible causes and brainstorm potential solutions.
- ❑ Include information about bicycle collision locations and hot spots in the annual traffic safety report to the City Council.

9 . Support Programs

This section addresses BTA requirements (g): “A description of bicycle safety and education programs conducted in the area included within the plan, efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the Vehicle Code pertaining to bicycle operation, and the resulting effect on accidents involving bicyclists.”

EXISTING PROGRAMS

Education is a critical element for a complete and balanced approach to improving both bicycling and pedestrian safety in Richmond. Education campaigns could include residents of all ages, especially emphasizing education of school children where safe bicycling habits

may be instilled as lifelong lessons. The following organizations and projects are involved in bicycle education initiatives in Richmond.

Safe Routes to School

Richmond has applied for multiple state and federal Safe Routes to Schools grants in recent years and has been awarded more than five grants, primarily for infrastructure improvements. Richmond has used Safe Routes to School funds for pedestrian infrastructure such as sidewalks, bulb-outs, and in-pavement flashers. In addition, Contra Costa Health Services (CCHS) conducts pedestrian and bicycle safety education and Safe Routes to School activities in selected Richmond middle and elementary schools. At the elementary level, activities include classroom presentations and the use of educational incentive items. CCHS also implemented the West Contra Costa Street Smarts Campaign; a media/materials based traffic safety education campaign

in Richmond and elsewhere in West County. The latter is a partnership with the City through the West Contra Costa Transportation Advisory Committee; however this program is no longer funded.

Richmond Bicycle/Pedestrian Advisory Committee

The Richmond BPAC (RBPAC) was formed in 2008 to allow the community to work in partnership with the City of Richmond. The RBPAC's mission is to promote local, commuter and recreational cycling and walking in Richmond and improve the safety of cyclists on our roads. The RBPAC provides input and feedback to the City on cycling and pedestrian infrastructure by reviewing plans and prioritizing projects. RBPAC also will undertake various cycling education and awareness activities in co-operation with the City.

Contra Costa Health Services

CCHS has been actively involved in bicycle and pedestrian safety efforts in Richmond. Since 2003 the CCHS Injury Prevention Project has made strides towards locating and prioritizing hotspots and improving pedestrian and bicycle safety through prevention. The Project has resulted in key traffic safety profiles, identification of hotspot intersections and improvement recommendations for areas such as the North and East neighborhoods, where prevalent speeding on local streets is a critical concern.

Richmond Spokes

Richmond Spokes is a training program that empowers young entrepreneurs to design, plan, market and execute their ideas related to bicycling. Youth participants provide cyclists with professional bicycle services, sales and accessories. Through education, empowerment, employment and engagement, Richmond Spokes encourages self-

sufficiency, job skill training, educational opportunities and a culture of stewards who use cycling and sustainable transportation to enable physical, personal, and professional mobility.

► <http://sites.google.com/a/richmondspokes.org/about/>



East Bay Bicycle Coalition

The East Bay Bicycle Coalition (EBBC) is a non-profit advocacy group that promotes bicycling as an everyday means of transportation. A great deal of EBBC's efforts focus on the development of local bicycle transportation plans in the 33 cities where they represent bicyclists' interests. EBBC further promotes the formation of grassroots Bicycle Advisory Committees (BACs) to review plans and prioritize funding.

The EBBC also advocates for countywide and regional bicycle planning and funding. The EBBC also organizes education and outreach events such as Bike to Work Day.

The Yellow Brick Road

The Yellow Brick Road is a youth conceived Safe Routes to Schools project that will be based in the Iron Triangle neighborhood of Richmond. The project will be led by Opportunity West, a community center that provides support to high-risk families and youth. Thus far, the Yellow Brick Road project has conducted walking audits and workshops to identify opportunities for safety improvements.

Bicycle Art Salon

The Bicycle Art Salon is a new community bicycling organization quickly “gathering steam” in Richmond.

RECOMMENDATIONS

The focus in bicycling planning is often on building capital projects. Support programs are important because they increase the safety, utility and viability of those projects. Municipalities provide support to, and even administer, a broad range of programs and activities related to bicycling safety, education, promotion and law enforcement as a way to complement their project-building efforts. Below is a list of programs and activities that have proven effective in other jurisdictions and which the City of Richmond could choose to offer its residents.

Education

- ❑ Provide funding and logistical support to the East Bay Bicycle Coalition for safe riding classes in Richmond.
- ❑ Develop and deliver bilingual educational campaigns (through billboards, public service announcements or brochures, for example) with bicycling safety and share-the-road messages.
- ❑ Sponsor design contests for posters or web material publicizing cycling as a means of transportation.
- ❑ Partner with the school district to: offer bicycle rodeos and “Safe Moves” training at elementary schools to teach children the basics of safe bicycling (and walking); to educate parents on the use of helmets, bicycle maintenance and safe cycling habits for their children; to develop curriculum material at the middle- and high school levels on bicycling; and to include bicycling information in the drivers’ education curriculum.
- ❑ Require that City planners and engineers attend trainings on bicycle planning and design.

Encouragement and promotion

- ❑ Provide funding and logistical support toward Bike to Work Day activities, and help publicize the event.
- ❑ Organize events similar to Oakland’s Oaklavia or San Francisco’s Sunday Streets, during which segments of one or more streets are closed to car traffic for bicycling, strolling, rolling and other recreational activities.
- ❑ Print and distribute full-color copies of maps of the city’s existing and proposed bikeway system—including key destinations and bike parking facilities—to schools, major employers and community organizations, among others.
- ❑ Install a map of biking routes and parking facilities in the Richmond BART/Amtrak station.

- ❑ Encourage cycling for seniors with a pilot program at a senior center.
- ❑ Publicize and distribute the Bicycle Master Plan among City staff, appointed and elected officials, and neighborhood and other community groups.
- ❑ Develop a bicycle fleet for use by City staff for work trips.
- ❑ Provide financial incentives—as well as lockers and showers—for employees who bike to work.
- ❑ Provide funding and logistical support to community-based organizations that offer bicycle repair and maintenance workshops for children or adults.

Law Enforcement

- ❑ Enforce traffic laws for both motorists and bicyclists, especially as a follow-up to an educational campaign.
- ❑ Train police officers on the rights of bicyclists.
- ❑ Provide adequate funding for a bicycle patrol unit within the Richmond Police Department, including to increase safety and personal security on bicycle paths.
- ❑ Create a bicycle diversion program for cyclists cited with traffic infractions.
- ❑ Hand out “safe riding” tickets to children to reinforce positive behaviors.

10 . Funding and implementation

This section addresses BTA requirements (j): “A description of the projects proposed in the plan and a listing of their priorities for implementation”, and (k): “A description of past expenditures for bicycle facilities and future financial needs for projects that improve safety and convenience for bicycle commuters in the plan area.”

FUNDING STRATEGY

There are numerous funding sources at the federal, state, regional, county and local levels that are potentially available to the City of Richmond to implement the bicycle projects and programs in the BMP. The City should expect that one of the main funding sources—if not the main one—will be Measure J, the local half-cent sales tax for transportation, which was approved by county voters in 2004. Below

is a description of the most promising funding programs, organized into two categories: programs under Measure J, which are administered by the Contra Costa Transportation Authority (CCTA); and programs administered by other agencies and organizations.

MEASURE J

Measure J authorized a number of funding programs that may be used for bicycle projects and programs. These are listed below (including the amount of funding available under each program) and are described in more detail in the expenditure plan for the measure.

► Measure J expenditure plan:

www.ccta.net/assets/documents/Measure%20J_expenditure%20plan.pdf

Pedestrian, Bicycle and Trail Facilities (\$23.3 million)

This is the single most important source of funds for bicycle projects under Measure J. It amounts to \$23.3 million, or 1.5 percent of the total revenue authorized by Measure J, over 25 years. Two-thirds of the funds, or \$15.5 million, are to “complete projects in the Countywide Bicycle and Pedestrian Plan.” The remaining one-third (\$7.8 million) is “to be allocated to the EBRPD for the development and rehabilitation of paved regional trails.”

Local Streets and Road Maintenance

According to the expenditure plan, funds under this program “may be used for any transportation purpose eligible under the Act Pedestrian and bicycle facilities are an important part of the regional transportation system. Moreover, as appropriate, components for routine accommodation of bicycle and pedestrian travel shall be incorporated as part of construction projects.”

Contra Costa Transportation for Livable Communities (CC-TLC) (\$77.5 million)

From the expenditure plan: “The CC-TLC Program is intended to support local efforts to achieve more compact, mixed-use development, and development that is pedestrian-friendly or linked into the overall transit system. The program will fund specific transportation projects that: (a) facilitate, support and/or catalyze developments, especially affordable housing, transit-oriented or mixed-use development, or (b) encourage the use of alternatives to the single occupant vehicle and promote walking, bicycling and/or transit usage. Typical investments include pedestrian, bicycle, and streetscape facilities, traffic calming and transit access improvements. Both planning grants

and specific transportation capital projects may receive funding under this program....”

Commute Alternatives (\$15.5 million)

“This program will provide and promote alternatives to commuting in single occupant vehicles, including carpools, vanpools and transit. Eligible types of projects may include but are not limited to: parking facilities, carpooling, vanpooling, transit, bicycle and pedestrian facilities (including sidewalks, lockers, racks, etc.), Guaranteed Ride Home, congestion mitigation programs, SchoolPool, and clean fuel vehicle projects.”

Major Streets: Traffic Flow, Safety, and Capacity Improvements (\$62.3 million)

Funds under this source will be available to all local jurisdictions for “Improvements to major thoroughfares including but not limited to installation of bike facilities, traffic signals, widening, traffic calming and pedestrian safety improvements, shoulders, sidewalks, curbs and gutters, bus transit facility enhancements such as bus turnouts and passenger amenities.”

Additional Funding for Livable Communities (\$6.2 million)

“This program will provide additional funding for West County to supplement the overall Transportation for Livable Communities Program, with specific projects to be identified by WCCTAC.” WCCTAC represents West County jurisdictions, including the City of Richmond.

Additional Pedestrian, Bicycle and Trail Facilities (\$0.6 million)

West Contra Costa Transportation Advisory Committee (WCCTAC) will propose programming these funds for additional trail/pedestrian/bicycle capital projects, and/or facility maintenance in West County.”

Eligible project types under Measure J funding sources

Pedestrian, Bicycle and Trail Facilities

- Pedestrian, bicycle and trail facilities that “complete projects in the Countywide Bicycle and Pedestrian Plan”
- Development and rehabilitation of paved EBRPD trails, to be spent equally in each subregion

Local Streets and Road Maintenance

- Generally any transportation purpose, including pedestrian and bicycle facilities

Contra Costa Transportation for Livable Communities

- Transportation projects that: (a) facilitate, support and/or catalyze developments, especially affordable housing, transit-oriented or mixed-use development, or (b) encourage the use of alternatives to the single occupant vehicle and promote walking, bicycling and/or transit usage
- Examples: pedestrian, bicycle, streetscape facilities, traffic calming and transit access improvements
- Both planning and capital projects

Commute Alternatives

- Alternatives to commuting in single occupant vehicles
- Examples: parking facilities; carpooling; vanpooling; transit, bicycle and pedestrian facilities; Guaranteed Ride Home; congestion mitigation programs; SchoolPool; and clean fuel vehicle projects

Major Streets: Traffic Flow, Safety, and Capacity Improvements

- Improvements to major thoroughfares
- Examples: traffic signals; widening; traffic calming and pedestrian safety improvements; bike facilities; shoulders; sidewalks; curbs and gutters; and bus transit facility enhancements

Additional Funding for Livable Communities

- Same as under Transportation for Livable Communities (see above), but only in West County

Additional Pedestrian, Bicycle and Trail Facilities

- Pedestrian, bicycle and trail facilities in West County
- Both capital and maintenance projects

OTHER FUNDING SOURCES

Below is a list of funding programs besides Measure J that routinely fund the development of bicycle facilities and programs in cities throughout the Bay Area. The first five are administered by MTC while the rest are administered by other agencies and organizations, as described below. It should be kept in mind that most of these sources are highly competitive and require the preparation of extensive and time-consuming applications.

Regional Bikeway Network Program

MTC’s “Regional Bicycle Plan for the San Francisco Bay Area” designates a regional bikeway network covering approximately 2,140 miles throughout the nine Bay Area counties. MTC has pledged \$1 billion to fully fund this regional bikeway network (with the exception of links on toll bridges) and will create a funding program with the intention of completing construction of the network by 2035. This program will replace the expired Regional Bicycle and Pedestrian Program.

Transportation Enhancements

Under the Transportation Enhancements (TE) program, California receives approximately \$60 million per year from the federal government to fund projects and activities that enhance the surface transportation system. The program funds projects under 12 eligible categories, including the provision of bike lanes, trails, bicycle parking and other bicycling facilities; safety-education activities for pedestrians and bicyclists; landscaping, streetscaping and other scenic beautification projects; and the preservation of abandoned railway corridors and their conversion to trails for nonmotorized transportation. In California, 75 percent of TE funding is distributed by the regional transportation planning agencies. For the Bay Area, MTC allocates the money through its Transportation for Livable Communities program (see below). The remaining 25 percent is allocated by Caltrans at the district level.

Transportation for Livable Communities

MTC created the Transportation for Livable Communities (TLC) program—not to be confused with the CC-TLC program under Measure J—in 1998. It provides technical assistance and funding to cities, counties, transit agencies and nonprofit organizations for capital projects and community-based planning that encourage multimodal travel and the revitalization of town centers and other mixed-use neighborhoods. The program funds projects that improve bicycling to transit stations, neighborhood commercial districts and other major activity centers.

- **MTC's TLC program:** www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm

Transportation Development Act (TDA), Article 3

TDA Article 3 is perhaps the most readily available source of local funding for bicycle projects. TDA funds are derived from a statewide quarter-cent retail sales tax. This tax is returned to the county of origin and distributed to the cities and county on a population basis. Under TDA Article 3, two percent of each entity's TDA allocation is set aside for pedestrian and bicycle projects; this generates approximately \$3 million in the Bay Area annually. Eligible projects include the design and construction of walkways, bike paths and bike lanes, and safety education programs. According to MTC Resolution 875, these projects must be included in an adopted general plan or bicycle plan and must have been reviewed by the relevant city or county bicycle advisory committee.

- **MTC's Procedures and Project Evaluation Criteria for the TDA Article 3 program:** www.mtc.ca.gov/funding/STA-TDA/RES-0875.doc

Climate Action Program

In partnership with the Bay Area Air Quality Management District, Bay Conservation Development Commission and the Association of Bay Area Governments, MTC is sponsoring a transportation-oriented Climate Action Program, designed to reduce mobile emissions through various strategies, including a grant program. The grant program will provide funding for bicycle projects through new Safe Routes to School and Safe Routes to Transit programs, with total funding expected to be approximately \$400 million. This funding will be in addition to the state and federal Safe Routes to School programs and MTC's existing Safe Routes to Transit program.

Bicycle Transportation Account (BTA)

The BTA is a Caltrans-administered program that provides funding to cities and counties for projects that improve the safety and convenience of bicycle commuting. Eligible projects include secure bike parking; bike-carrying facilities on transit vehicles; installation of traffic-control devices that facilitate bicycling; planning, design, construction and maintenance of bikeways that serve major transportation corridors; and elimination of hazards to bike commuters. In fiscal year 2008/09, the BTA provided \$7.2 million for projects throughout the state. To be eligible for BTA funds, a city or county must prepare and adopt a bicycle transportation plan that meets the requirements outlined in Section 891.2 of the California Streets and Highways Code.

► Bicycle Transportation Account:

www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm

Safe Routes to Transit (SR2T)

SR2T is a grant-funding program that emerged out of the Bay Area's Regional Measure 2, which instituted a \$1 toll increase on the Bay Area's seven state-owned toll bridges. Through the SR2T program, up to \$20 million is to be allocated through 2013 on a competitive basis to programs, planning efforts and capital projects designed to reduce congestion on toll bridges by improving bicycling and walking access to regional transit services that serve toll-bridge corridors. Funds can be used for secure bike storage at transit; safety enhancements and barrier removal for bike access to transit; and systemwide transit enhancements to accommodate bicyclists. The SR2T program is administered by two nonprofit organizations, TransForm and the East Bay Bicycle Coalition, with MTC serving as the fiscal agent. The program awarded approximately \$3.9 million during each of its first two cycles,

in 2005 and 2007. Future funding cycles are scheduled to occur in 2009, 2011 and 2013.

► Bay Area Safe Routes to Transit funding program:

www.transformca.org/campaign/sr2t

Safe Routes to School (SR2S)

California's Safe Routes to Schools program (SR2S) is a Caltrans-administered grant-funding program established in 1999 (and extended in 2007 to the year 2013). Eligible projects include bikeways, walkways, crosswalks, traffic signals, traffic-calming applications, and other infrastructure projects that improve the safety of walking and biking routes to elementary, middle and high schools, as well as "incidental" education, enforcement and encouragement activities. Planning projects, on the other hand, are not eligible. In fiscal year 2007/08, approximately \$25.5 million was available in grant funding.

► Caltrans Safe Routes to School program:

www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

Bay Trail grants

The San Francisco Bay Trail Project—a non-profit organization administered by the Association of Bay Area Governments—provides grants to plan, design and construct segments of the Bay Trail. The amount, and even availability, of Bay Trail grants vary from year to year, depending on whether the Bay Trail Project has identified a source of funds for the program. In recent years, grants have been made using funds from Proposition 84, the 2006 Clean Water, Parks and Coastal Protection Bond Act; however, this is a limited-term source of funds.

- **Bay Trail grants:** www.baytrail.org/grants.html

Transportation Fund for Clean Air (TFCA)

TFCA is a grant program administered by the Bay Area Air Quality Management District (BAAQMD). The purpose of the program, which is funded through a \$4 surcharge on motor vehicles registered in the Bay Area, is to fund projects and programs that will reduce air pollution from motor vehicles. A sub-program of the TFCA is the Bicycle Facility Program (BFP), which provides funding for bicycle paths, lanes, signed routes, bicycle parking, bus racks and other bicycle-related projects. Grant awards are generally made on a first-come, first-served basis to qualified projects. Funding for bicycle projects is also available through the TFCA's County Program Manager Fund. Under that sub-program, 40 percent of TFCA revenues collected in each Bay Area county is returned to that county's congestion management agency (CMA) for allocation (the CCTA, in Contra Costa's case). Applications are made directly to the CMAs, but must also be approved by the BAAQMD.

- **TFCA Bicycle Facility Program:**
www.baaqmd.gov/pln/grants_and_incentives/bfp/index.htm
- **TFCA County Program Manager Fund:**
www.baaqmd.gov/pln/grants_and_incentives/tfca/cpm_fund.htm

Measure WW

In 2008, Contra Costa and Alameda County voters approved EBRPD's Measure WW, the "Regional Open Space, Wildlife, Shoreline and Parks Bond." This extension of a similar 1988 bond measure allocates \$33 million specifically to trail projects in the county. In addition, the measure will provide \$48 million directly to cities, the county and spe-

cial park and recreation districts for their park and recreation needs, including trails and other nonmotorized transportation projects.

- **Measure WW:** www.ebparks.org/ww

Hazard Elimination Safety

Administered in California by Caltrans, the federal Hazard Elimination Safety (HES) program provides funds to eliminate or reduce the number and severity of traffic collisions on public roads and highways. Cities and counties compete for HES funds by submitting candidate projects to Caltrans for review and analysis. Caltrans prioritizes these projects statewide and approves priority projects for funding through its annual HES program plan. Historically, only about 20 percent of applications are approved for funding. In the 2005-2006 program cycle, Caltrans awarded approximately \$16 million under the HES program.

- **Hazard Elimination Safety program:**
www.dot.ca.gov/hq/LocalPrograms/hesp/hesp.htm

Eligible project types under other funding sources

Regional Bikeway Network Program (MTC)

- Projects on the Bay Area regional bikeway network, except links on toll bridges

Transportation Enhancements (MTC, Caltrans)

- Twelve categories of projects and activities that enhance the surface transportation system, including: bike lanes, trails, bicycle parking and other bicycling facilities; safety education activities for pedestrians and bicyclists; landscaping, streetscaping and other scenic beautification projects; and the preservation of abandoned railway corridors and their conversion to trails for nonmotorized transportation

Transportation for Livable Communities (MTC)

- Capital projects and community-based planning that encourage multimodal travel and the revitalization of town centers and other mixed-use neighborhoods
- Projects that improve bicycling and walking to transit stations, neighborhood commercial districts and other major activity centers

Transportation Development Act, Article 3 (MTC, Authority)

- Pedestrian and bicycle projects in an adopted general plan or bicycle plan
- Examples: design and construction of walkways, bike paths and bike lanes; safety education programs; the preparation of comprehensive bicycle or pedestrian plans

Climate Action Program (MTC, BAAQMD, BCDC, ABAG)

- Pedestrian and bicycle projects as part of safe routes to school and safe routes to transit

Bicycle Transportation Account (Caltrans)

- Projects that improve the safety and convenience of bicycle commuting
- Examples: secure bike parking; bike-carrying facilities on transit vehicles; installation of traffic-control devices that facilitate bicycling; planning, design, construction and maintenance of bikeways that serve

major transportation corridors; and elimination of hazards to bike commuters

Safe Routes to Transit (TransForm, EBBC)

- Programs, planning efforts and capital projects that will improve bicycling and walking access to regional transit services that serve toll-bridge corridors
- Examples: secure bike storage at transit; safety enhancements and barrier removal for pedestrian or bike access to transit; systemwide transit enhancements to accommodate bicyclists or pedestrians; access improvements to car-sharing pods

Safe Routes to School (Caltrans)

- Bikeways, walkways, crosswalks, traffic signals, traffic-calming applications, and other infrastructure projects that improve the safety of walking and biking routes to elementary, middle and high schools
- “Incidental” education, enforcement and encouragement activities

Bay Trail Grants (Bay Trail Project)

- Planning, design and construction of segments of the Bay Trail

Transportation Fund for Clean Air (BAAQMD)

- Projects and programs that will reduce air pollution from motor vehicles
- Examples: Bicycle paths, lanes, signed routes, bicycle parking, bus racks and other bicycle-related projects

Measure WW (EBRPD)

- EBRPD trail projects
- Park and recreation needs of cities, the county and special park and recreation districts, including trails and other nonmotorized transportation projects

Hazard Elimination Safety (Caltrans)

- Projects that eliminate or reduce the number and severity of traffic collisions on public roads and highways

Current and Past Expenditures

Over the past five years, the City of Richmond has spent approximately \$555,000 on bicycle facilities. Annual expenditures over this period were as follows:

FY 2005 = \$80,000

FY 2006 = N/A

FY 2007 = \$75,000

FY 2008 = \$110,000

FY 2009 = \$70,000

FY 2010 = \$220,000

These expenditures were spent on improvements and maintenance of the Bay Trail, on-street bike lanes and routes, and bicycle lockers. Understanding the City's investment in the existing bikeway system and what is required to complete the system is important in developing a funding strategy. With an approximate length of 31 miles, the existing bikeway system represents a substantial investment.

PRIORITIZATION

The methodology employed to prioritize the bikeway projects was developed by Fehr & Peers specifically for the City of Richmond, but is similar to that used by other Bay Area agencies in their bikeway plans. There are a total of 20 possible points based on five elements:

- Connectivity (5 points)
- Regional access (5 points)
- Relative ability to implement (4 points)
- Activity centers (3 points)
- Safety (3 points)

The methodology used to score projects within each element is described below:

Connectivity (five points)

This criterion evaluates the ability of a bicycle facility to provide access to major streets, to provide connections between activity centers, and to connect to and extend existing bicycle facilities and to link neighborhoods and/or overcome physical barriers between them. Projects with high connectivity received five points, moderate connectivity received two points, and low connectivity received one point. A more detailed description of how each proposed bikeway was evaluated is shown below.

5 points: A proposed bikeway that meets one of the following conditions:

- connects to existing bikeways and/or activity centers on both ends
- bridges a gap in an existing "crucial" bikeway (defined as a bikeway that provides cross-town access or is on a major arterial)
- serves as a collector of other bikeways or residential streets
- passes through the entire city

2 points: A proposed bikeway meets the following conditions:

- does not qualify for five points, but
- connects to existing bikeways and/or activity centers on one end
- serves as a bypass to busy arterial streets

1 point: A proposed bikeway that meets the following conditions:

- does not qualify for two or five points, but
- connects to a proposed bikeway on one or both ends

Regional access (five points)

The methodology for assessing regional access for each project was as follows:

- **5 points:** Projects that provide direct access to a regional trail, or across a freeway or railroad crossing
- **3 points:** Projects that provide access to a bikeway in an adjacent city
- **2 points:** Projects that provide direct access to a BART station or bus route

Relative ease of implementation (four points)

The relative ease of project implementation was determined through a review of existing plans, field review of the study area, and level of construction required for implementation. The methodology for assessing ability to implement each project was as follows:

On-street projects

- **4 points:** High implementation ability: projects that do not require repaving, re-striping, modification of existing street layout, ROW acquisition, or converge with the City's overall planning priorities
- **2 points:** Moderate implementation ability: projects that require repaving, re-striping and minor modifications to the existing layout
- **1 point:** Low implementation ability: projects that require major construction, ROW acquisition, or inter-jurisdictional coordination

Off-street projects

- **4 points:** High implementation ability: projects along existing maintenance or access roads that do not require significant grading

or ROW acquisition, or converge with the City's overall planning priorities

- **2 points:** Moderate implementation ability: projects that require moderate grading and construction
- **1 point:** Low implementation ability: projects that require ROW acquisition, major construction, significant grading, bridges, or require coordination with multiple agencies

Activity centers (three points)

The number of local and regional activity centers on or near a proposed bikeway was counted. Activity centers include existing or planned parks and recreation centers, shopping and medical centers, schools, and large employment centers. Examples of activity centers in Richmond are the Richmond intermodal (BART/Amtrak) transit center and El Cerrito Del Norte BART Station, Civic Center, Hilltop Mall, Point Richmond, Downtown Richmond, the Bay Trail, Point Pinole Regional Park, and Miller Knox Regional Shoreline, Ford Point, Contra Costa College, and commercial areas along Macdonald Avenue, and San Pablo Avenue. The total number of activity centers along a bikeway route was averaged on a per-mile basis.

- **3 points:** Projects with three or more activity centers per mile
- **2 points:** Projects with between two and three activity centers per mile
- **1 point:** Projects with fewer than two activity centers per mile

Safety (three points)

On-street projects: The methodology for assessing the safety of on-street lanes and routes is based on the number of bicycle collisions on the roadway over the past five years and/or through assessments based on bike audits/Reality Rides:

- **3 points:** Projects that provide a bikeway facility on a roadway with more than 4 collisions per mile over the past five years
- **2 points:** Projects that provide a bikeway facility on a roadway with 2 to 3 collisions per mile over the past five years
- **1 point:** Projects that provide a bikeway facility on a roadway with less than one collision per mile over the past five years

The City may choose to reevaluate the safety of a proposed project based on community safety concerns & priorities, including information collected on future bicycling audits and Reality Rides assessments.

Off-street projects: The methodology for assessing the safety of off-street bicycle trails is based on the potential for conflicts with motor vehicles:

- **3 points:** Intersection improvement projects and grade separation projects
- **3 points:** Trail and path projects that cross roads and driveways fewer than one time per mile
- **2 points:** Trail and path projects that cross roads and driveways fewer than two times per mile
- **1 point:** Trails and path projects that cross roads and driveways fewer than three times per mile
- **1 point:** Allow bicyclists to avoid of mid-block crossings

Prioritization Results

The projects identified in Chapter 6 were scored and ranked using the methodology described above, and then sorted by estimated cost. Projects were then assigned to short-term (12-19 points; 1-5 years), medium-term (8-11 points; 6-10 years), or long-term/opportunistic (4-7 points; 11-20 years) categories. The tables on the following pages summarize the list of projects by priority and cost.

The following ranking of projects provides an initial framework for the relative priority of projects. As community needs and interests change over time, new development opportunities arise, and as bicycle facilities on the citywide network are completed, priority projects will also shift. The City should reevaluate the prioritization scoring on an ongoing basis to ensure that the list reflects current values and real time opportunities.

Table 10-1 | Near-term On-Street Projects (5 years)

Segment #	Name	From	To	Class	Distance	Cost*	Prioritization Score (20 points total)
CR-EW-12a	Ohio Avenue	2nd St	1st St	2	0.05	\$	20
CR-EW-14a	Cutting Boulevard	San Pablo Ave	Hoffman Blvd	2	3	\$\$\$	19
CR-EW-7	Roosevelt Avenue	Wilson Ave	Portola Ave	3 Bike Blvd	1.56	\$\$\$	19
CR-NS-10	23rd Street/ Marina Bay Parkway	Regatta Blvd	Emeric Ave	1, 3	2.46	\$\$\$	19
CR-EW-10b	Richmond Greenway	San Pablo Ave	Ohlone Greenway	1	0.1	\$\$	18
CR-NS-5	6th/7th/Filbert Street	Maine Ave	Vernon Ave	2,3 (Bike Blvd)	1.92	\$\$\$	18
CR-NS-7b	Pennsylvania Ave Bridge	Pennsylvania Ave	Esmond Ave	1 & 2	0.3	\$\$\$	18
CR-EW-15	Hoffman Boulevard	Harbour Way	Cutting Blvd	2 (SB)	0.3	\$	17
HT-1	Giant Road/Highway	Atlas Rd	Brookside Dr	3	2.4	\$	17
CR-NS-8	Marina Way/ 15 th /16 th Street	Macdonald Ave	Costa Ave	2, 3 (Bike Blvd)	2.30	\$\$	17
CR-NS-11	Carlson Boulevard	Broadway	Central Ave	2	3.1	\$\$	17
ES-3a	San Pablo Dam Road	Mifflin Ave	El Portal Drive	2	0.17	\$	16
HT-12	El Portal Drive	San Pablo Dam Rd	I-80	2	0.2	\$	16
ES-3b	San Pablo Dam Road	Southern City Limits	Castro Ranch Rd	2	0.95	\$	16
HT-2	Richmond Parkway	Collins Ave	I-80	2	1.61	\$	16
HT-4	Hilltop Drive	Alhambra Rd	San Pablo Ave	2	1.66	\$	16
CR-EW-2	Emeric Avenue/ Chesley/ Gertrude Avenue	26th St	McKosken Rd	1, 3	1.38	\$\$	16
CR-EW-10a	Richmond Greenway	23rd St	RR crossing	1	0.1	\$\$\$	16

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
CR-NS-15	29th /30th St/33rd Street, 33rd St Bridge	Vale Rd	Wall Ave	1, 3 (Bike Blvd)	1.95	\$\$\$\$	16
CR-EW-9	Nevin Avenue	45th St	Richmond Pkwy	1, 3 (Bike Blvd)	2.00	\$\$\$\$	16
CR-NS-24	San Pablo Avenue	Lowell Ave	Barrett Ave	3	0.91	\$	15
CR-NS-1	Richmond Pkwy	Gertude Ave	Pennsylvania Ave	2	0.94	\$	15
CR-EW-4	McBryde Avenue	Alvarado Park	Wilson Ave	2, 3	0.7	\$\$	15
CR-EW-24	Fresno Avenue	San Luis	San Pablo Ave	3 Bike Blvd	0.42	\$\$	15
CR-NS-25	Amador Street/ Key Boulevard	McBryde Ave	Macdonald Ave	2, 3 (Bike Blvd)	1.16	\$\$	15
CR-EW-3	Maricopa/ Costa Avenue	San Pablo Ave	13th St	3 Bike Blvd	1.35	\$\$\$	15
CR-NS-6	Harbour Way	Pennsylvania Ave	Wright Ave	1, 2, 3	1.48	\$\$\$\$	15

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

Table 10-2 | Medium-term On-Street Projects (6-10 years)

Segment #	Name	From	To	Class	Distance	Cost*	Prioritization Score (20 points total)
CR-NS-7a	13th Street/Portola Avenue	Costa Ave	Barrett Ave	1, 2	0.88	\$\$	14
CR-NS-21	Ells Lane	Cypress Ave	Bayview Ave	1, 3	0.12	\$	14
CR-NS-17b	Richmond Greenway spur	East side of Target Parking lot		1	0.1	\$\$	14
CR-EW-8	Barrett Avenue	Key Blvd	Richmond Pkwy	2	2.64	\$\$\$	14
CR-EW-25	Central Avenue	San Joaquin St	Rydin Rd	2	0.3	\$	14
HT-6	Birmingham Drive	Shane Dr	Robert Miller Dr	3	0.44	\$	13
CR-NS-13	Spring/ 31st/ Erlandson Street	29th St	Regatta Blvd	3	0.63	\$	13
CR-EW-6	McLaughlin Street/ Clinton Avenue	Sonoma St	Wilson Ave	3	0.59	\$	13
HT-8	Moyers Road/ Drive	Hilltop Dr	Annapolis Ave	3	0.79	\$	13
CR-EW-17	Potrero Avenue	53rd St	Carlson Blvd	2	0.66	\$	13
HT-7	Shane Drive	Hilltop Dr	Fordham St	3	0.9	\$	13
ES-6	May Road	Bruno Rd	Valley View Rd	2	0.7	\$	13
HT-3	San Pablo Avenue	Stanton Ave	Richmond Parkway	2	0.76	\$	13
CR-NS-3	2nd Street	Pennsylvania Ave	Cutting Blvd	3	1.18	\$	13
CR-NS-22	56th / San Luis / Pierce Street	Potrero Ave	Central Ave	3	1.6	\$	13
CR-EW-23	Tehama Avenue	San Pablo Ave	Carlson Blvd	3 Bike Blvd	0.4	\$\$	13
CR-EW-21	Commodore Drive/ Seaport Avenue	51st St	Regatta Blvd	1	0.66	\$\$\$\$	13
HT-9	Hilltop Lake Path connection	BlumeHilltop Lake	Richmond Pkwy	3	0.12	\$	12

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
ES-1a	Castro Ranch Rd EBRPD trail connection	San Pablo Dam Rd	EBRPD, Wildcat Canyon	3	0.32	\$	12
HT-5	Lancaster/ Robert H. Miller Drive	San Pablo Ave	Hilltop Dr	2, 3	0.9	\$	12
CR-EW-18	Meeker/ Wright Avenue	Marina Bay Ave	Marina Way	2, 3	0.6	\$	12
CR-NS-23	Imperial Ave/ 55th St/San Joaquin Street	Potrero Ave	Central Ave	3	1.54	\$	12
CR-EW-22	Bayview Avenue	55th St	51st St	2, 3	0.71	\$	12
ES-5	Castro Ranch Road	Conestoga Way	Country View Dr	2	0.47	\$\$	12
CR-NS-19	47th/49th/45th Street	Carlson Blvd	Richmond Greenway	3 Bike Blvd	1.3	\$\$\$	12
CR-EW-5	Solano/ Garvin/ Pennsylvania Avenue	35th St	Harbour Way	2, 3 (Bike Blvd)	2.96	\$\$\$	12
CR-NS-17a	Wilson Ave/43rd /44th/45th Street	McBryde Ave	Macdonald Ave	3 Bike Blvd	1.03	\$\$\$\$	12
CR-EW-1	Market Avenue	Soto St	RR tracks	3	0.12	\$	11
ES-1b	San Pablo Dam Road EBRPD trail connection	San Pablo Dam Rd at Lakeside Athletic Club	EBRPD, Wildcat Canyon	3	0.21	\$	11
CR-NS-9	18th/19th Street	Costa Ave	Nevin Ave	3 Bike Blvd	0.92	\$	11
ES-4	Valley View Road	Pine Hill Dr	Sunset Dr	2	0.72	\$	11
HT-11	Park Central	Fitzgerald Dr	Hilltop Dr	2	0.9	\$	11
HT-10	Blume Drive	Richmond Pkwy	Hilltop Dr	2	0.8	\$\$	11
CR-NS-12	24th/25th Street	Market Ave	Macdonald	2, 3 (Bike Blvd)	0.9	\$\$	11

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
CR-NS-18	46th Street	Seaver Ave	Bay Trail	1	0.57	\$\$\$\$	11
CR-NS-2	Shared Use Path along RR ROW	Brookside Drive	Chesley Ave	1	0.68	\$\$\$\$	11
CR-NS-16	37th Street, Cerrito Avenue/ 38th Street	Carlson Blvd	Garvin Ave	2, 3	1.49	\$\$	10

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

Table 10-3 | Long-term/Opportunistic On-Street Projects

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
CR-EW-11	Macdonald Avenue	Key Blvd	Richmond Pkwy	3	2.82	\$\$	16
CR-EW-13	Wall Avenue/ 41st St/Center Ave/ Maine Avenue	49th St	2nd St	1, 3 (Bike Blvd)	3.3	\$\$\$\$	10
CR-NS-26	Canal Boulevard	Cutting Blvd	400' north of E Richmond Ave	2 (SB only)	0.3	\$	9
CR-EW-16	Berk Avenue	49th Street	Cutting Blvd	3	0.5	\$	9
HT-13	Goodrick Avenue	Parr Ave	Richmond Pkwy	2	0.38	\$	9
ES-2	Sobrante Regional Preserve Trail	Castro Ranch Rd	Trail	1	1.05	\$\$\$\$	8
CR-EW-20	Regatta Boulevard	Marina Way	I-580 overpass	2	1.64	\$	7
CR-EW-19	Regatta Boulevard	Marina Way	Marina Bay Pkwy	1	(0.64) existing	\$\$	7
CR-NS-20	51st Street	East Montgomery Ave	Bay Trail	1	0.22	\$\$\$	7
CR-NS-14	Meade Street	Regatta Blvd	51st St	1, 2	0.83	\$\$\$	7
CR-NS-4	RR frontage stub	Richmond Pkwy	Chesley Ave	1	0.96	\$\$\$\$	7

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

Table 10-4 | Near-term Trail Projects

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
CT-5	Cerrito Creek Trail	Southern edge of Pacific East Mall	N/A	1	0.17	\$\$\$	20
BT-10	Pt Richmond	Intersection of Castro St & Tewksbury Ave	Existing trail under Richmond/San Rafael Bridge	1	0.9	\$	18
BT-6	Pt Richmond	Ferry Point Tunnel	Intersection of Garrard Ave & Cutting Blvd	1	0.1	\$\$	17
BT-17	Wildcat Creek Trail North	Wildcat Creek Trail western Terminus	Richmond Parkway	1	1.1	\$\$\$\$	17
BT-3	Brickyard Cove Road	Opposite Mallard Dr	Garrard Blvd	1	0.3	\$\$\$	16
BT-22	Atlas Road	Richmond Pkwy	Point Pinole Regional Park	1	1.18	\$\$\$\$	16
BT-1	Central Avenue	South from EBRPD Class I trail along Rydin Road	Caltrans Class I trail along I-580, Albany	1	0.1	\$\$	15
CT-4	Wildcat Creek Trail Crossing	Richmond Parkway	N/A	N/A	N/A	\$\$\$	15
BT-7	Tewksbury/ Railroad Avenue	Tewksbury Avenue	Railroad Ave (from where BT-9b ends)	1	0.45	\$\$\$\$	15

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

Table 10-5 | Medium-term Trail Projects

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
BT-8b	Richmond Avenue/ Castro Street	Railroad Ave	Tewksbury Ave	3	0.28	\$	14
BT-8a	Railroad Avenue	Garrard Ave	Railroad Ave	2	0.1	\$	14
BT-13	Pt Molate - Pt San Pablo	Northern boundary of former Point Molate Naval Fuel Depot	Southern boundary of City's Point San Pablo Property	1	0.54	\$\$	13
BT-2	S. 32nd Street connection	Regatta Blvd	Meeker Creek (south side)	1	0.15	\$\$	13
BT-4	Brickyard Cove Road loop south of Miller Knox Regional Shoreline	East end of Dorman Dr	Brickyard Cove Rd	1	0.62	\$\$\$	13
BT-12	Pt Molate	Shoreline of former Point Molate Naval Fuel Depot		1	1.4	\$\$\$\$	13
BT-11	Pt. Richmond - Pt Molate	North side of Richmond/San Rafael Bridge	Point Molate beach at boundary of former Naval Fuel Depot	1	1.26	\$\$\$\$	13
BT-21	Point Pinole Regional Shoreline	Point Pinole Regional Shoreline	Point Wilson, Pinole	1	0.58	\$\$\$\$	13

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

Table 10-6 | Long-term/Opportunistic Trail Projects

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Cost*</i>	<i>Prioritization Score (20 points total)</i>
BT-20	Former Freethy Industrial Park	Southwest to Richmond Pkwy	North end of Goodrick Ave	1	0.94	\$\$\$\$	12
BT-18	Goodrick Avenue	Richmond Pkwy north	waterfront	1	0.53	\$\$\$\$	12
BT-19	Goodrick Avenue	Goodrick Ave	Bay View Trail in Point Pinole Regional Shoreline	1	0.75	\$\$\$\$	12
BT-5	BNSF railroad right-of-way	Richmond Ave	Keller Beach	1	0.33	\$\$\$\$	12
BT-9	Western Drive	Dorman Dr	Chevron Long Wharf	3	1	\$	11
CT-3	Wildcat Creek Trail	Giant Rd	City Limit	1	0.12	\$	11
CT-1	Brookside Trail	Giant Rd	City Limit/RR tracks	1	0.14	\$	11
CT-2	Creek Trail	I-80	Contra Costa College	1	1.17	\$\$\$\$	11
BT-14	Pt Molate - Pt San Pablo	Point San Pablo former Terminal 4		1	1.53	\$\$\$\$	10
BT-16	Point San Pablo Yacht Harbor			1	0.31	\$\$\$\$	10
BT-15	Pt San Pablo	Northern boundary of City of Richmond's Point San Pablo Property	Point San Pablo Yacht Harbor	1	0.48	\$\$\$\$	10

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

Cost of New Bicycle Facilities

Table 10-7 provides a conceptual unit cost summary for the construction of bikeway facilities in Richmond. These estimates are based on costs experienced in Richmond and other communities throughout the State, with small increases to account for engineering, construction management, inspection, and contingency costs. Actual costs may vary widely depending on the existing conditions and scope of the project. More detailed estimates should be developed following the preliminary engineering stage as individual projects advance towards implementation. Table 10-8 summarizes the estimated total costs of the entire proposed network.

For purposes of this Bicycle Master Plan, conceptual construction costs for the proposed system were based on the following assumptions:

- New Class I facilities would be constructed on generally flat right-of-way with no grade separation and minimal grading needed given the existing topography within the City; cost of right-of-way acquisition is not included.
- New Class II facilities would require minor improvements
- New Class III facilities would require signing and stencils only. An adjustment to account for traffic control costs is included.
- New Class III bike boulevard facilities include costs for signing, stencils and traffic calming treatments.

Table 10-7 | Conceptual unit cost estimates for bikeway construction

<i>Facility Type</i>		<i>Improvement</i>	<i>Estimated Cost Per Mile</i>
Class I	Bike Path	Construct Path with Minimal Grading Needed	\$1.2 million
Class II	Bike Lane	Signing/Striping Only	\$20,000
		Signing/Striping with Minor Improvements	\$80,000
Class III	Bike Route	Signing Plus Stencils	\$15,000
	Bike Boulevard	Signing/Stencils Plus Traffic Calming	\$250,000

*Costs are in 2011 dollars, excluding right-of-way costs.

Table 10-8 | Conceptual Cost Estimates Summary

<i>Facility Type</i>		<i>Length of Proposed Segments</i>	<i>Estimated Cost (2011 \$)</i>
Class I	Bike Paths	30 miles	\$36,000,000
Class II	Bike Lane	32 miles	\$2,560,000
Class III	Bike Route	25.8 miles	\$390,000
	Bike Boulevard	16.6 miles	\$4,150,000
Total Estimated Costs			\$43,100,000

Construction of the Class I, II and III system would require approximately \$45.1 million, which equates to an investment of approximately \$2.25 million per year over 20 years. A significant portion of the proposed system would be constructed as part of new development or as re-development occurs. In many cases, City of Richmond general

fund revenues will not be required to cover these costs because (a) there are many sources of grants which should be pursued, (b) other government agencies such as EBRPD plan Class I improvements and (c) bikeway improvements will be made as part of private development projects. For example, virtually all of the Bay Trail segments built in Richmond during the last decade were planned, designed and built using grant funds obtained by TRAC for use by the City of Richmond, as part of development projects, or by EBRPD using both grants and their own sources of property tax revenues.

Maintenance Costs

Multi-use path maintenance includes cleaning, resurfacing, and re-striping the asphalt path, repairing bridges and other structures, cleaning drainage systems, removing trash, and landscaping. While this maintenance effort may not be incrementally major, it does have the potential to develop heavy expenses if it is not done periodically. The City of Richmond is responsible for maintaining all Class I paths in the City, including most of the Bay Trail, with the following major exceptions:

East Bay Regional Parks District

- Trail segments within the Regional Shoreline parks
- Wildcat Creek Regional Trail with its linkage with West County Landfill and Eastshore State Park, which includes the trail from Marina Bay to Point Isabel Regional Shoreline, Rydin Road, Isabel Street and Central Avenue from Isabel Street to the end of a 4' high fence well before Central Avenue

Caltrans

- From the Albany border to Central Avenue and west along Central Avenue to the beginning of a 4' high fence where East Bay Regional Parks District becomes responsible for the maintenance

Republic Services: West County Landfill

- Seacliff Homeowner's Association: Brickyard Cove Road and Seacliff Drive frontages of the Seacliff residential development

Volunteer maintenance of Class I paths should be pursued whenever possible. Various groups have adopted sections of the Richmond Greenway who have agreed to be responsible for the upkeep of designated areas. These volunteer arrangements encourage more neighborhood awareness and community buy-in, as well as helping to keep the Greenway in good shape.

The estimated annual maintenance expenses for Class I bike paths is approximately \$25,000 per mile. If all of the proposed bike paths were implemented, there would be a total of approximately 59 miles of Class I facilities, including the Bay Trail. The annual maintenance cost for Class I facilities is estimated at about \$1,465,000.

For Class II bike lanes, the cost consists of maintaining pavement markings and striping. The estimated annual cost is \$62,000 for a full build-out of approximately 39 miles of Class II facilities.

Lastly, Class III facilities will require maintenance of bike signs located along the bike route. For approximately 48 miles of Class III bike routes at full build-out, the annual cost is estimated at \$7,000.

Table 10-9 | Conceptual Annual Maintenance Costs

<i>Facility Type</i>		<i>Length of Existing & Proposed Segments</i>	<i>Estimated Cost (2010 \$)</i>
Class I	Bike Paths	58.1 miles	\$1,452,500
Class II	Bike Lane	38.7 miles	\$62,000
Class III	Bike Route/Bike Boulevard	47.7 miles	\$7,000
<i>Total Estimated Annual Maintenance Costs</i>			\$1,521,200

IMPLEMENTATION PLAN

The City has already accomplished a great deal to encourage bicycling in Richmond. Richmond has the longest and most scenic section of the Bay Trail and is blessed with more shoreline than any other city in the Bay Area. In addition, the Richmond Greenway provides a critical east-west Class I pathway connection across the center of the City. As such, the City has the potential to be a magnet for people seeking healthy lifestyles, particularly as the City's bicycle network develops.

To fully achieve the vision set forth in this Plan, close coordination among City agencies, neighboring jurisdictions, and the community-at-large will be required. The Richmond Bicycle/Pedestrian Advisory Committee will play a central role in stewarding the implementation of this Plan. The following Implementation Road Map identifies the key implementation tasks, primary responsible agencies, a recommended timeline, as well as the relative cost and priority of each task. Upon adoption, the City should craft a five-year work plan based on this Plan.

Table 10-10 | Implementation Plan

Task Type	Task	Lead Agency/ Partner	Timeline	Relative Cost*	Relative Priority	Master Plan Chapter
Bicycle Network Improvements						
Near-term Bikeway Projects	Identify priority projects for implementation and pursue funding for design and construction.	Planning Dept, Engineering Dept, Redevelopment Dept	5 years	\$-\$\$\$\$	High	Appendix A, "Proposed Bicycle Routes"
Medium-Term Bikeway Projects	Ensure that medium-term bicycle projects are considered as new funding sources, redevelopment or other opportunities arise.	Planning Dept, Engineering Dept, Redevelopment Dept	6-10 years	\$-\$\$\$\$	Moderate	Appendix A, "Proposed Bicycle Routes"
Long-term/ Opportunistic Bikeway Projects	Ensure that long-term bicycle projects are considered as new funding sources, redevelopment or other opportunities arise.	Planning Dept, Engineering Dept, Redevelopment Dept	Ongoing-Long-term	\$-\$\$\$\$	Low	Appendix A, "Proposed Bicycle Routes"
Bikeway Project Prioritization	Reevaluate the prioritization of projects as facilities are constructed, new opportunities arise, and priorities shift over time.	Planning Dept, RBPAC	Annual	\$	Moderate	Chapter 10, "Funding and Implementation"
Repaving	Coordinate repaving projects with proposed on-street bicycle improvements; prioritize repaving on streets with existing and proposed facilities with poor pavement conditions.	Planning Dept, Engineering Dept	Ongoing	\$	High	Chapter 6, "Proposed Bicycle Network"
Loop Detection	Develop a program to ensure that loop detectors along existing and planned bikeways are functioning and detect bicycles.	Public Works Dept	Ongoing	\$	High	Chapter 6, "Proposed Bicycle Network"
Bicycle Network Maintenance Plan	As part of the City's standard roadway maintenance procedures, develop a bicycle network maintenance plan which includes regular sweeping so that all bikeways continue to operate optimally.	Public Works Dept	Short-term	\$ – \$\$	High	Chapter 6, "Proposed Bicycle Network"

Task Type	Task	Lead Agency/ Partner	Timeline	Relative Cost*	Relative Priority	Master Plan Chapter
SWITRS Reports	Obtain and make available to the public standardized SWITRS reports for collisions in Richmond involving bicyclists for the latest available calendar year.	Police Dept	Annual	\$	High	Chapter 8, "Collisions"
Trends	Analyze collision trends from SWITRS reports and include the information in an annual traffic safety report.	Engineering Dept	Annual	\$	Medium	Chapter 8, "Collisions"
Hot Spots	Create and analyze maps of collision locations, and seek solutions to any newly identified collision hotspots.	Engineering Dept	Annual	\$	High	Chapter 8, "Collisions"
Support Programs						
Educational Campaign	Develop and deliver bilingual educational campaigns with bicycling safety and share-the-road messages.	Engineering Dept, Police Dept	Annual	\$	High	Chapter 9, "Support Programs"
School-Related Efforts	Partner with the school district on a variety of recommended age-appropriate efforts to promote bicycling among students.	Engineering Dept	Ongoing	\$	Medium	Chapter 9, "Support Programs"
Other Education	Conduct other recommended educational activities as funding and staff time permit.	Engineering Dept	Ongoing	\$	Low	Chapter 9, "Support Programs"
Encouragement and Promotion Events	Provide support toward Bike to Work Day activities and recreational events similar to Oakland's Oaklavia.	Engineering Dept	Annual	\$	High	Chapter 9, "Support Programs"
Bicycling Maps	Print and distribute full-color copies of maps of the city's existing and proposed bikeway system.	Engineering Dept	Every 5 years	\$	Medium	Chapter 9, "Support Programs"
Other Encouragement and Promotion	Conduct other recommended encouragement and promotion activities as funding and staff time permit.	Engineering Dept	Ongoing	\$	Low	Chapter 9, "Support Programs"

Task Type	Task	Lead Agency/ Partner	Timeline	Relative Cost*	Relative Priority	Master Plan Chapter
Law Enforcement	Continue to enforce traffic laws for motorists and bicyclists, and train police officers on the rights of bicyclists.	Police Dept	Ongoing	\$	High	Chapter 9, "Support Programs"
Bicycle Patrol Unit	Provide adequate funding for a bicycle patrol unit.	Police Dept	Annual	\$\$	Low	Chapter 9, "Support Programs"
Policy						
Staff Coordinator	Seek funds to hire a part- to full-time pedestrian and bicycle coordinator to oversee all projects set forth in the Pedestrian and Bicycle Plans.	TBD	Ongoing	\$\$	High	Chapter 3, "Policy Framework"
Pedestrian Plan	Coordinate BMP implementation with the recommendations set forth in the Pedestrian Plan to ensure that bicycling and walking improvements complement one another.	Citywide	Ongoing	\$	High	Chapter 2, "Related Plans"
General Plan Policies	Conduct a detailed review of relevant policies and actions in the General Plan, and develop implementation mechanisms for any not addressed in the BMP or through other City plans and processes.	Planning Dept	Short- to medium-term	\$	Medium	Chapter 2, "Related Plans;" Chapter 3, "Policy Framework"
Other Policy Items	Develop, adopt and implement other recommended policies as staff resources permit.	Planning Dept	Ongoing	\$	Low	Chapter 3, "Policy Framework"
Implementation Report and Work Plan	Develop an annual BMP implementation progress report (for the previous year) and work plan (for the next year).	Planning Dept	Annual	\$	High	Chapter 3, "Policy Framework"

*Estimated Order of Magnitude Cost: \$ = <\$50K, \$\$ = \$50K-\$200K, \$\$\$ = \$200K-\$500K, \$\$\$\$ = >\$500K

A . Proposed Bicycle Routes

Table A-1 | Central Richmond Routes – Condensed Project List

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
NORTH-SOUTH ROUTES						
CR-NS-1	Richmond Parkway	Gertude Ave	Pennsylvania Ave	2	0.94	15
CR-NS-2	Shared Use Path along RR ROW	Brookside Drive	Chesley Ave	1	0.68	11
CR-NS-3	2nd Street	Pennsylvania Ave	Cutting Blvd	3	1.18	13
CR-NS-4	RR frontage stub	Richmond Pkwy	Chesley Ave	1	0.96	7
CR-NS-5	6th/7th/Filbert Street	Maine Ave	Vernon Ave	2,3 (Bike Blvd)	1.92	18
CR-NS-6	Harbour Way	Pennsylvania	Wright Ave	2, 3	1.48	15
CR-NS-7a	13th Street/Portola Avenue	Costa Ave	Barrett Ave	1, 2	0.88	14
CR-NS-7b	Pennsylvania Ave Bridge	Pennsylvania Ave	Esmond Ave	1 & 2	0.3	18

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
CR-NS-8	Marina Way/ 15 th /16th Street	Wright Ave	Costa Ave	2, 3 (Bike Blvd)	2.30	17
CR-NS-9	18th/19th Street	Costa Ave	Nevin Ave	3 Bike Blvd	0.92	11
CR-NS-10	23rd Street/ Marina Bay Parkway	Emeric Ave	Harbor View Drive	1, 2, 3	3.31	19
CR-NS-11	Carlson Boulevard	Broadway	Central Ave	2	3.1	17
CR-NS-12	24th/25th Street	Market Ave	Macdonald Ave	2, 3 (Bike Blvd)	0.9	11
CR-NS-13	Spring/ 31 st / Erlandson Street	29th St	Regatta Blvd	3	0.63	13
CR-NS-14	Meade Street	Regatta Blvd	51st St	1, 2	0.83	7
CR-NS-15	29th /30th/33rd Street, 33rd St Bridge	Vale Rd	Wall Ave	1, 3 (Bike Blvd)	1.95	16
CR-NS-16	37th Street, Cerrito Avenue/ 38th Street	Cerrito Ave	Garvin Ave	2, 3	1.49	10
CR-NS-17a	Wilson Avenue/43rd /44th/45th Street	McBryde Ave	Macdonald Ave	3 Bike Blvd	1.03	12
CR-NS-17b	Richmond Greenway spur	East side of Target parking lot		1	0.1	14
CR-NS-18	46th Street	Seaver Ave	Bay Trail	1	0.57	11
CR-NS-19	47th/49th/45th Street	Carlson Blvd	Richmond Greenway	3 Bike Blvd	1.3	12
CR-NS-20	51st Street	East Montgomery Ave	Bay Trail	1	0.22	7
CR-NS-21	Ells Lane	Cypress Ave	Bayview Ave	1, 3	0.12	14
CR-NS-22	56th/ San Luis / Pierce Street	Potrero Ave	Central Ave	3	1.6	13
CR-NS-23	Imperial Ave/ 55th St/San Joaquin Street	Potrero Ave	Central Ave	3	1.54	12
CR-NS-24	San Pablo Avenue	Lowell Ave	Barrett Ave	3	0.91	15

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
CR-NS-25	Amador Street/ Key Boulevard	McBryde Ave	Macdonald Ave	2, 3 (Bike Blvd)	1.16	15
CR-NS-26	Canal Boulevard	Cutting Blvd	400' north of E Richmond Ave	2 (SB only)	0.3	9
EAST-WEST ROUTES						
CR-EW-1	Market Avenue	Soto St	RR tracks	3	0.12	10
CR-EW-2	Emeric Avenue/ Chesley/ Gertrude Avenue	26th St	McKosken Rd	1, 3	1.38	11
CR-EW-3	Maricopa/ Costa Ave	San Pablo Ave	13th St	3 Bike Blvd	1.35	16
CR-EW-4	McBryde Avenue	Alvarado Park	Wilson Ave	2, 3	0.7	15
CR-EW-5	Solano/ Garvin/ Pennsylvania Avenue	35th St	Harbour Way	2, 3 (Bike Blvd)	2.96	15
CR-EW-6	McLaughlin Street/ Clinton Avenue	Sonoma St	Wilson Ave	3	0.59	12
CR-EW-7	Roosevelt Avenue	Wilson Ave	Portola Ave	3 Bike Blvd	1.56	13
CR-EW-8	Barrett Avenue	Key Blvd	Richmond Pkwy	2	2.64	19
CR-EW-9	Nevin Avenue	45th St	Richmond Pkwy	1, 3 (Bike Blvd)	2.24	14
CR-EW-10a	Richmond Greenway	23rd St	RR crossing	1	0.1	16
CR-EW-10b	Richmond Greenway	San Pablo Ave	Ohlone Greenway	1	0.1	16
CR-EW-11	Macdonald Avenue	Key Blvd	Richmond Pkwy	3	2.82	18
CR-EW-12a	Ohio Avenue	2nd St	1st St	2	0.05	16
CR-EW-12b	Ohio Avenue	Garrard Ave	N/A	Bike detection		20
CR-EW-13	Wall Avenue/ 41st St/Center Ave/ Maine Avenue	49th St	2nd St	1, 3 (Bike Blvd)	3.3	10

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
CR-EW-14	Cutting Blvd	San Pablo Ave	Hoffman Blvd	2	3	19
CR-EW-15	Hoffman Boulevard	Harbour Way	Cutting Blvd	1, or 2 (SB)	0.3	17
CR-EW-16	Berk Avenue	49th Street	Cutting Blvd	3	0.5	9
CR-EW-17	Potrero Avenue	53rd St	Carlson Blvd	2	0.66	13
CR-EW-18	Meeker/ Wright Avenue	Marina Bay Ave	Marina Way	2, 3	0.6	12
CR-EW-19	Regatta Boulevard	Marina Way	Marina Bay Pkwy	1	-0.64 existing	13
CR-EW-20	Regatta Boulevard	Marina Way	I-580 overpass	2	1.64	12
CR-EW-21	Commodore Dr/ Seaport Ave	51st St	Regatta Blvd	1	0.66	7
CR-EW-22	Bayview Avenue	55th St	51st St	2, 3	0.71	7
CR-EW-23	Tehama Avenue	San Pablo Ave	Carlson Blvd	3 Bike Blvd	0.4	13
CR-EW-24	Fresno Avenue	San Luis	San Pablo Ave	3 Bike Blvd	0.42	15
CR-EW-25	Central Avenue	San Joaquin St	Rydin Rd	2	0.3	14

Table A-2 | Hilltop and El Sobrante Valley Routes – Condensed Project List

Segment #	Name	From	To	Class	Distance	Prioritization score (20 points total)
HILLTOP AREAS						
HT-1	Giant Road/Highway	Atlas Rd	Brookside Dr	3	2.4	17
HT-2	Richmond Parkway	Collins Ave	I-80	2	1.61	16
HT-3	San Pablo Avenue	Stanton Ave	Richmond Parkway	2	0.76	13
HT-4	Hilltop Drive	Alhambra Rd	San Pablo Ave	2	1.66	16
HT-5	Lancaster/ Robert H. Miller Drive	San Pablo Ave	Hilltop Dr	2, 3	0.66	12
HT-6	Birmingham Drive	Shane Dr	Robert Miller Dr	3	0.44	13
HT-7	Shane Drive	Hilltop Dr	Fordham St	3	0.9	13
HT-8	Moyers Road/ Drive	Hilltop Dr	Annapolis Ave	3	0.79	13
HT-9	Hilltop Lake Path connection	BlumeHilltop Lake	Richmond Pkwy	3	0.12	12
HT-10	Blume Drive	Richmond Pkwy	Hilltop Dr	2	0.8	11
HT-11	Park Central	Fitzgerald Dr	Hilltop Dr	2	0.9	11
HT-12	El Portal Drive	San Pablo Dam Rd	I-80	2	0.2	16
HT-13	Goodrick Avenue	Parr Ave	Richmond Pkwy	2	0.38	9
EL SOBRANTE VALLEY						
ES-1a	Castro Ranch Rd EBRPD trail connection	San Pablo Dam Rd	EBRPD, Wildcat Canyon	3	0.32	12
ES-1b	San Pablo Dam Road EBRPD trail connection	San Pablo Dam Rd at Lakeside Athletic Club	EBRPD, Wildcat Canyon	3	0.21	11
ES-2	Sobrante Regional Preserve Trail	Castro Ranch Rd	Trail	1	1.05	8
ES-3a	San Pablo Dam Rd	Mifflin Ave	El Portal Drive	2	0.17	16

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
ES-3b	San Pablo Dam Road	Southern City Limits	Castro Ranch Rd	2	0.95	16
ES-4	Valley View Road	Pine Hill Dr	Sunset Dr	2	0.72	11
ES-5	Castro Ranch Road	Conestoga Way	Country View Dr	2	0.47	12
ES-6	May Road	Bruno Rd	Valley View Rd	2	0.7	13

Table A-3 | Bay Trail and Creek Trails – Condensed Project List

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
BAY TRAIL SEGMENTS						
BT-1	Central Avenue	South from EBRPD Class I trail along Rydin Road	Caltrans Class I trail along I-580, Albany	1	0.1	15
BT-2	S. 32nd Street connection	Regatta Blvd	South side of Meeker Creek	1	0.15	13
BT-3	Brickyard Cove Road	Opposite Mallard Dr	Dornan Drive	1	0.3	16
BT-4	Brickyard Cove Road loop south of Miller Knox Regional Shoreline	East end of Dorman Dr	Brickyard Cove Rd	1	0.62	13
BT-5	BNSF railroad right-of-way	Richmond Ave	Keller Beach	1	0.33	12
BT-6	Pt Richmond	Ferry Point Tunnel	Intersection of Garrard Ave & Cutting Blvd	1	0.1	17
BT-7	Tewksbury Avenue	Railroad Avenue (picking up from where BT-9b ends)	Castro St	1	0.45	15
BT-8a	Railroad Avenue	Garrard Ave	Railroad Ave	2	0.1	14

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
BT-8b	Richmond Avenue/ Castro Street	Railroad Ave	Tewksbury Ave	3	0.28	14
BT-8c	Richmond Avenue	Garrard Ave	Canal Blvd	1, 3	0.33	12
BT-9	Western Drive	Dorman Dr	Chevron Long Wharf	3	1	11
BT-10	Pt Richmond	Intersection of Castro St & Tewksbury Ave	Existing trail under Richmond/San Rafael Bridge	1	0.9	18
BT-11	Pt. Richmond - Pt Molate	North side of Richmond/San Rafael Bridge	Point Molate beach at boundary of former Naval Fuel Depot	1	1.26	13
BT-12	Pt Molate	Shoreline of former Point Molate Naval Fuel Depot		1	1.4	13
BT-13	Pt Molate - Pt San Pablo	Northern boundary of former Point Molate Naval Fuel Depot	Southern boundary of City of Richmond's Point San Pablo Property	1	0.54	13
BT-14	Pt Molate - Pt San Pablo	Point San Pablo former Terminal 4		1	1.53	10
BT-15	Pt San Pablo	Northern boundary of City of Richmond's Point San Pablo Property	Point San Pablo Yacht Harbor	1	0.48	10
BT-16	Point San Pablo Yacht Harbor			1	0.31	10
BT-17	Wildcat Creek Trail North	Wildcat Creek Trail western Terminus	Richmond Parkway	1	1.1	17
BT-18	Goodrick Avenue	Richmond Pkwy north	waterfront	1	0.53	12
BT-19	Goodrick Ave	Goodrick Ave	Bay View Trail in Point Pinole Regional Shoreline	1	0.75	12

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Class</i>	<i>Distance</i>	<i>Prioritization score (20 points total)</i>
BT-20	Former Freethy Industrial Park	Southwest to Richmond Pkwy	North end of Goodrick Ave	1	0.94	12
BT-21	Point Pinole Regional Shoreline	Point Pinole Regional Shoreline	Point Wilson, Pinole	1	0.58	13
BT-22	Atlas Road	Richmond Pkwy	Point Pinole Regional Park	1	1.18	16

WILDCAT CREEK TRAIL SEGMENTS

CT-1	Brookside Trail	Giant Rd	City Limit/RR tracks	1	0.14	11
CT-2	Creek Trail	I-80	Contra Costa College	1	1.17	11
CT-3	Wildcat Creek Trail	Giant Rd	City Limit	1	0.12	11
CT-4	Wildcat Creek Trail Crossing	Richmond Parkway	N/A	N/A	N/A	15
CT-5	Cerrito Creek Trail	Southern edge of Pacific East Mall	N/A	1	0.17	20

Table A-4 | Central Richmond – Complete Project List

C: Connectivity RA: Regional access
I: Relative ability to implement AC: Activity centers S: Safety

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score
NORTH-SOUTH ROUTES										
CR-NS-1	Richmond Pkwy	Gertude Ave	Pennsylvania Ave	Signage & stripe bike lanes Consider buffer between bike lane & travel lane	5	5	2	2	1	15
CR-NS-2	Shared Use Path along RR ROW	Brookside Drive	Chesley Ave	Install Shared Use path	1	5	1	3	1	11
CR-NS-3a	2nd Street	Pennsylvania Ave	Cutting Blvd	Signage & Sharrows	5	3	2	3	2	15
CR-NS-3b	Filbert Street	Chesley Ave	Vernon Ave	Signage & Sharrows	5	0	2	3	1	11
CR-NS-4	RR frontage stub	Richmond Pkwy	Chesley Ave	Shared Use path behind school and along east side of RR ROW Requires RR grade crossing	1	2	1	2	1	7
CR-NS-5a	6th Street	Maine Ave	Barrett Ave	Signage & Sharrows Bike blvd treatments	5	3	4	3	3	18
CR-NS-5b	7th Street	Vernon Ave	RR track	Signage & stripe bike lanes Narrow lane widths Remove Bots Dots Coordinate with Pedestrian Master Plan recommendations	5	3	4	3	1	16
CR-NS-5c	7th Street	RR track	Barrett Ave	Signage & Sharrows Bike blvd treatments Coordinate with Pedestrian Master Plan recommendations	5	3	4	3	3	18
CR-NS-6a	Harbour Way	Pennsylvania	Macdonald Ave	Lane Reduction/ Road Diet Sign and stripe bike lanes Coordinate with Pedestrian Master Plan recommendations	5	0	4	3	3	15
CR-NS-6b	Harbour Way	Macdonald Ave	Ohio Ave	Lane Reduction/ Road Diet On-street parking Sign & Stripe lanes Coordinate with Pedestrian Master Plan recommendations	5	0	2	3	2	12
CR-NS-6c	Harbour Way South	Ohio Ave	Cutting Ave	Install Shared Use path	5	5	2	3	1	16

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Proposed Improvements</i>	<i>C</i>	<i>RA</i>	<i>I</i>	<i>AC</i>	<i>S</i>	<i>Prioritization Score</i>
CR-NS-6d	Harbour Way South	Cutting Ave	Wright Ave	Interchange improvements Signage & stripe bike lanes Fix/install bicycle detection loops at Harbor/Hoffman intersection	5	5	1	3	1	15
CR-NS-7a	13th Street/Portola Avenue	Costa Ave	Barrett Ave	Lane Reduction/ Road Diet to Garvin Ave Sign & Stripe Bike Lanes Class I shared use pathway connection from Garvin to Barrett Ave along RR ROW	1	3	4	3	3	14
CR-NS-7b	Pennsylvania Ave Bridge	Pennsylvania Ave	Esmond Ave	Class I path on west side of bridge Signage & stripe bike lanes on bridge Coordinate with Pedestrian Master Plan recommendations	5	5	2	3	3	18
CR-NS-8a	Marina Way	Macdonald Ave	Richmond Greenway	Signage & Sharrows Bike blvd treatments	5	5	4	3	3	20
CR-NS-8b	Marina Way	Richmond Greenway	Wright Ave	Signage & stripe bike lanes	5	5	4	3	2	19
CR-NS-8c	16th Street	Macdonald Ave	Richmond Greenway	Signage & Sharrows	2	3	4	3	1	13
CR-NS-8d	15th Street	Costa Ave	Portola Ave	Signage & Sharrows	2	3	4	3	1	13
CR-NS-9	18th/19th Street	Costa Ave	Nevin Ave	Signage & Sharrows Bike blvd treatments	1	2	4	3	1	11
CR-NS-10a	23rd Street	Emeric Ave	Bissell Ave	23rd Street Streetscape Project recommendations Consider bike box at 23rd St right turn onto Bissell Ave. Daylight corners at Bissell/23rd St intersection to improve sightlines.	5	5	4	3	2	19
CR-NS-10b	S. 23rd Street	Ohio Ave	Meeker Ave	Lane Reduction/ Road Diet Sign & Stripe lanes Coordinate with Pedestrian Master Plan recommendations	5	5	4	3	2	19
CR-NS-10c	Marina Bay Parkway	Regatta Blvd	Meeker Ave	Officer Bradley A. Moody Memorial Underpass project. Add bike loop detector at Department of Public Health complex exit.	5	5	3	3	2	18

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score
CR-NS-11a	Carlson Blvd	Broadway	45 th St	Signage & stripe bike lanes Lane reduction/ road diet Buffered bike lanes Smooth lip between gutter & roadway Coordinate with Pedestrian Master Plan recommendations	5	5	2	3	2	17
CR-NS-11b	Carlson Blvd	45 th St	Central Ave	Signage & stripe bike lanes	5	5	2	3	1	16
CR-NS-12a	24th/25th Street	Market Ave	Grant Ave	Signage & Sharrows Bike Blvd treatments North-south connection through Richmond HS Improve pavement conditions on 25th St btwn Downer & Garvin Ave. Traffic circle at Grant Ave intersection	2	3	2	3	0	10
CR-NS-12b	24th Street	Grant Ave	Macdonald Ave	Signage & Stripe lanes Potential roundabout at Roosevelt Ave	2	3	2	3	2	12
CR-NS-13	Spring Street/ 31st Street/ Erlandson St	29th St	Regatta Blvd	Provide connection north to Maine Ave RR crossing	2	3	4	3	1	13
CR-NS-14a	Meade Street	Regatta Blvd	Seaver Ave	Long-term improvement along RR ROW	1	0	1	3	1	6
CR-NS-14b	Meade Street	Regatta Blvd	51st St	Signage & stripe bike lanes	1	0	2	3	1	7
CR-NS-15a	29th /30th St/33rd Street	Vale Rd	Richmond Greenway	Signage & Sharrows Bike Blvd treatments	5	3	4	3	1	16
CR-NS-15b	33rd Street Bridge	Richmond Greenway		Install bike ramp on stairs	5	3	4	3	1	16
CR-NS-15c	33rd Street	Richmond Greenway	Wall Ave	Signage & Sharrows Bike Blvd treatments	5	3	4	3	1	16
CR-NS-16a	37th Street	Cerrito Ave	Wall Ave	Signage & Stripe buffered lanes Potential roundabout at Roosevelt Ave	2	0	2	3	1	8
CR-NS-16b	37th Street	Wall Ave	Cutting Blvd	Signage & Sharrows	2	0	4	3	3	12
CR-NS-16c	37th Street	Cutting Blvd	Carlson Blvd	Signage & stripe bike lanes	2	0	4	3	3	12
CR-NS-16d	Cerrito Avenue/ 38th Street	Garvin Ave	37th St	Signage & Sharrows	1	0	4	3	1	9

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score
CR-NS-17a	Wilson Ave/43rd /44th/45th Street	McBryde Ave	Macdonald Ave	Signage & Sharrows Bike blvd treatments Improve spur path connection to San Pablo Ave at Roosevelt Ave. Interchange improvements at Barrett Ave, provide signalized crossing at Barrett Ave. Make 44th St two-way btwn Nevin & Barrett Ave Provide Class 3 route along 43rd St in short-term Provide cut in median across Macdonald Ave	5	3	1	2	1	12
CR-NS-17b	Richmond Greenway spur	East side of Target Parking lot		Pave connection between Macdonald Ave & Richmond Greenway along the east side of Target Provide cut in McDonald Ave median to provide bicycle access to Greenway	1	5	4	3	1	14
CR-NS-18	46th Street	Seaver Ave	Bay Trail	Long-term, alignment unknown	1	5	1	3	1	11
CR-NS-19	47th/49th/45th Street	Carlson Blvd	Richmond Greenway	Signage & Sharrows Bike blvd treatments	1	3	4	3	1	12
CR-NS-20	51st Street	East Montgomery Ave	Bay Trail	Long-term, alignment unknown	1	3	1	1	1	7
CR-NS-21a	Ells Lane	Cypress Ave	Flemming Ave	Install curb ramps to access existing path Improve paving along pathway	1	5	4	3	1	14
CR-NS-21b	Ells Street	Flemming Ave	Bayview Ave	Signage & Sharrows	1	5	4	3	1	14
CR-NS-22	56th St/ San Luis St/ Pierce St	Potrero Ave	Central Ave	Signage & Sharrows	2	3	4	3	1	13
CR-NS-23	Imperial Ave/ 55th St/San Joaquin Street	Potrero Ave	Central Ave	Signage & Sharrows	2	3	4	3	1	12
CR-NS-24	San Pablo Avenue	Lowell Ave	Barrett Ave	Signage & Sharrows Potential for Green Sharrow lane in center of outside travel lane Coordinate with Pedestrian Master Plan recommendations	5	5	1	2	2	15
CR-NS-25a	Amador Street	McBryde Ave	Clinton Ave	Signage & Sharrows Bike blvd treatments	2	3	4	3	1	13
CR-NS-25b	Key Boulevard	Clinton Ave	Macdonald Ave	Signage & stripe bike lanes	5	3	4	3	1	16

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score
CR-NS-26	Canal Boulevard	Cutting Blvd	400' north of E Richmond Ave	Signage & stripe bike lanes in SB direction NB lane existing Consider Class I path between Seacliff Dr and the SS Red Oak Victory as a long-term alternative	1	0	4	3	1	9

EAST-WEST ROUTES

CR-EW-1	Market Avenue	Soto St	RR tracks	Signage & Sharrows	1	3	2	3	1	10
CR-EW-2a	Emeric Avenue	23rd	26th	Signage & Sharrows	1	3	4	3	1	12
CR-EW-2b	Connection through Richmond High School	26th St	26th St	Pathway connection	2	3	2	3	1	11
CR-EW-2c	Chesley/ Gertrude Avenue	Rumrill Blvd	McKosken Rd	Signage & Sharrows	1	3	4	2	1	11
CR-EW-3	Maricopa/ Costa Ave	San Pablo Ave	13th St	Signage & Sharrows Bike blvd traffic calming treatments Provide cut in San Pablo Ave median to allow northbound bicyclists to make a left-turn onto Maricopa Ave. Intersection improvements at 23rd St, in-pavement flashers or stutter flash Future connection to multi-use path in San Pablo and ped/bike bridge over I-80	5	3	4	3	1	16
CR-EW-4a	McBryde Avenue	Alvarado Park	San Pablo Ave	Signage & stripe bike lanes Crossing improvements at San Pablo Avenue Lane narrowing or reduction	1	5	4	3	2	15
CR-EW-4b	McBryde Avenue	San Pablo Ave	Wilson Ave	Signage & Sharrows	1	5	4	3	3	16
CR-EW-5a	Solano Av	35th St	Arlington Blvd	Signage & Sharrows Bike Blvd treatments Intersection improvements at San Pablo Ave	5	5	4	3	2	19

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Proposed Improvements</i>	<i>C</i>	<i>RA</i>	<i>I</i>	<i>AC</i>	<i>S</i>	<i>Prioritization Score</i>
CR-EW-5b	Garvin Avenue	13th St	Wilson Ave	Improve connection across 23rd St. Signage & Sharrows Coordinate with Pedestrian Master Plan recommendations	5	0	4	3	1	13
CR-EW-5c	Pennsylvania Avenue	3rd St	Harbour Way	Travel Lane Reduction/ Road Diet Signage & stripe bike lanes Coordinate with Pedestrian Master Plan recommendations	5	0	2	3	3	13
CR-EW-6	McLaughlin Street/ Clinton Avenue	Sonoma St	Wilson Ave	Signage & Sharrows	2	3	4	3	1	12
CR-EW-7	Roosevelt Avenue	Wilson Ave	Portola Ave	Signage & Sharrows Improve road pavement conditions btwn 22nd/23rd Potential bike blvd treatments: Mini-roundabouts Roundabouts at 37th St & 24th St Intersection improvements at 23rd St	5	0	4	3	1	13
CR-EW-8	Barrett Avenue	Key Blvd	Richmond Pkwy	Travel Lane Reduction/ Road Diet Signage & Stripe lanes Redevelopment Agency Plans. Install bike loop detectors at key intersections, such as 27th St and San Pablo Ave	5	5	4	3	2	19
CR-EW-9a	Nevin Avenue	45th St	19th St	Signage & Sharrows Bike blvd treatments Nevin Ave Streetscape project recommendations	5	2	4	3	1	15
CR-EW-9b	Nevin Avenue	11th St	9th St	Signage & Sharrows Bike blvd treatments	5	2	4	3	1	15
CR-EW-9c	Nevin Avenue	9th St	8th St	Pathway connection	2	2	4	3	1	12
CR-EW-9d	Nevin Avenue	8th St	Richmond Pkwy	Signage & Sharrows Bike blvd treatments	5	2	4	3	1	15

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score
CR-EW-10a	Richmond Greenway	23rd St	RR crossing	Complete connection between east and west spans of Greenway. Short-term: improvements at Ohio Ave crossing, cycle track connection along S. 23 rd Street between Ohio Ave & 22 nd St, improvements at the 22 nd / Carlson / Broadway intersection. Long-term: grade separated ped/bike bridge across 23rd St.	5	5	2	3	1	16
CR-EW-10b	Richmond Greenway	San Pablo Ave	Ohlone Greenway	Signalized mid-block connection btwn Richmond & Ohlone Greenway	5	5	2	3	1	16
CR-EW-11	Macdonald Avenue	Key Blvd	Richmond Pkwy	Green Sharrow lane in center of outside travel lane Signage & Sharrows. Install loop detectors at 16th St/BART parking lot entrance	5	5	2	3	3	18
CR-EW-12a	Ohio Avenue	2nd St	1st St	Remove on-street parking on north side of street Signage & stripe bike lanes	5	3	4	3	1	16
CR-EW-12b	Ohio Avenue	Garrard Ave	N/A	Install bike loop detectors and length green signal phase on Ohio Ave to accommodate bicycle travel through intersection.	N/A	N/A	N/A	N/A	N/A	N/A
CR-EW-13a	Wall Avenue	49th St	41st St	Signage & Sharrows Bike blvd treatments	2	0	4	3	1	10
CR-EW-13b	Wall Avenue	41st St	39th St	Provide shared use path connection on south side of athletic courts	2	0	2	3	1	8
CR-EW-13c	Wall Avenue	39th St	33rd St	Signage & Sharrows Bike blvd treatments	2	0	4	3	1	10
CR-EW-13d	41st St/Center Ave	WallAve/ 41st St	Carlson Blvd	Signage & Sharrows Improve intersection crossing at Carlson Blvd	2	0	4	3	1	10
CR-EW-13e	Maine Ave	Carlson Blvd	29th St	RR crossing improvements similar to Richmond Greenway improvements at 23rd St/RR tracks	2	5	1	3	1	12
CR-EW-13f	Maine Ave	28th St	12th St	Signage & Sharrows Bike blvd treatments	2	0	4	3	1	10
CR-EW-13g	Virginia Ave	12th St	Harbour Way	Improve east-west access between park and school	2	0	4	3	1	10
CR-EW-13h	Maine Ave	Harbour Way	2nd St	Signage & Sharrows Bike blvd treatments	1	0	4	3	1	9

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score
CR-EW-14a	Cutting Blvd	San Pablo Ave	Hoffman Blvd	Signage & Stripe lanes Lane Reduction/ Road Diet Coordinate with General Plan and Pedestrian Master Plan recommendations Consider signal improvements at Carlson Blvd in the near-term, and roundabout in the mid-to long-term	5	5	2	3	3	18
CR-EW-14b	Cutting Blvd	Canal Blvd	N/A	Install bike loop detectors	5	5	4	3	3	20
CR-EW-15	Hoffman Blvd	Harbour Way	Cutting Blvd	Reconfigure travel lanes to accommodate bike lanes in both directions, or a Class I pathway alongside the roadway. This may include removal of on-street parking on west side of street, and removing turn lane at the intersections of Cutting Blvd and Harbour Way. Add signage.	5	5	2	3	2	17
CR-EW-16	Berk Avenue	49th Street	Cutting Blvd	Signage & Sharrows	1	0	4	3	1	9
CR-EW-17	Potrero Avenue	53rd St	Carlson Blvd	Signage & stripe bike lanes	2	3	4	3	1	13
CR-EW-18a	Meeker Avenue	Marina Bay Ave	Wright Ave	Signage & Sharrows	2	5	4	1	1	13
CR-EW-18b	Wright Avenue	Marina Way	Meeker Ave	Remove on-street parking on north side Signage & Stripe bike lanes	2	5	2	1	1	11
CR-EW-19	Regatta Boulevard	Marina Way	Marin Bay Pkwy	Class I path improvements include better signage, trim back landscaping, improve sightlines and pathway transitions. Install bike loop detectors and improve signal phasing at Marina Bay Pkwy	1	5	4	2	1	13
CR-EW-20	Regatta Boulevard	Marina Way	I-580 overpass	Signage & stripe bike lanes	1	5	4	1	1	12
CR-EW-21	Commodore Dr/ Seaport Ave	51st St	Regatta Blvd	Long term, alignment unknown	1	3	1	1	1	7
CR-EW-22a	Bayview Avenue	55th St	Carlson Blvd	Signage & Sharrows	1	0	4	3	1	9
CR-EW-22b	Bayview Avenue	Carlson Blvd	51st St	Interchange improvements Signage & Stripe bike lanes	1	0	2	1	1	5
CR-EW-23	Tehama Ave	San Pablo Ave	Carlson Blvd	Signage & Sharrows Bike blvd treatments	2	3	4	3	1	13

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Proposed Improvements</i>	<i>C</i>	<i>RA</i>	<i>I</i>	<i>AC</i>	<i>S</i>	<i>Prioritization Score</i>
CR-EW-24	Fresno Avenue	San Luis	San Pablo Ave	Signage & Sharrows Bike blvd treatments	2	5	4	3	1	15
CR-EW-25	Central Avenue	San Joaquin St	Rydin Rd	I-580 Interchange improvements Improve Bay Trail connection	2	5	1	3	3	14

Table A-5 | Hilltop and El Sobrante Valley – Complete Project List

C: Connectivity RA: Regional access
I: Relative ability to implement AC: Activity centers S: Safety

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score (20 points)
HILLTOP AREA										
HT-1	Giant Road/Hwy	Atlas Rd	Brookside Dr	Signage & Sharrows	5	5	4	2	1	17
HT-2a	Richmond Pkwy	Atlas Rd	Collins Ave	Signage & stripe bike lanes Consider buffer between bike lane & travel lane	5	5	4	1	1	16
HT-2b	Richmond Pkwy	San Pablo Ave	I-80	Signage & stripe bike lanes Consider buffer between bike lane & travel lane	5	5	4	1	1	16
HT-3	San Pablo Avenue	Stanton Ave	Richmond Parkway	Signage & stripe bike lanes Narrow travel lanes	5	3	2	2	1	13
HT-4	Hilltop Drive	Alhambra Rd	San Pablo Ave	Signage & stripe bike lanes Potential travel lane narrowing	5	5	2	3	1	16
HT-5a	Lancaster Dr	San Pablo Ave	Birmingham Dr	Signage & Sharrows	2	3	4	3	1	13
HT-5b	Robert H. Miller Dr	Birmingham Dr	Hilltop Dr	Signage & stripe bike lanes Lane reduction on EB side	2	3	2	3	1	11
HT-6	Birmingham Drive	Shane Dr	Robert Miller Dr	Signage & Sharrows	2	3	4	3	1	13
HT-7	Shane Drive	Hilltop Dr	Fordham St	Signage & Sharrows	2	3	4	3	1	13
HT-8	Moyers Road/ Drive	Hilltop Dr	Annapolis Ave	Signage & Sharrows	2	3	4	3	1	13
HT-9	Hilltop Lake Path connection	BlumeHilltop Lake	Richmond Pkwy	Coordinate with YMCA to provide signage and sharrows through parking lot	1	3	4	3	1	12
HT-10	Blume Drive	Richmond Pkwy	Hilltop Dr	Signage & stripe bike lanes Potential travel lane narrowing Improve intersection at Hilltop Drive to accommodate bicycle travel	2	3	2	3	1	11
HT-11	Park Central	Fitzgerald Dr	Hilltop Dr	Signage & stripe bike lanes Provide connection through back side of shopping mall along Fitzgerald Dr	2	3	4	1	1	11
HT-12	El Portal Drive	San Pablo Dam Rd	I-80	Signage & stripe bike lanes	5	3	4	3	1	16
HT-13	Goodrick Ave	Parr Ave	Richmond Pkwy	Remove on-street parking Signage & stripe bike lanes	1	3	2	2	1	9

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score (20 points)
EL SOBRANTE VALLEY										
ES-1a	Castro Ranch Rd EBRPD trail connection	San Pablo Dam Rd	EBRPD, Wildcat Canyon	Coordinate with EBRPD to provide access to open space	1	3	4	3	1	12
ES-1b	San Pablo Dam Road EBRPD trail connection	San Pablo Dam Rd at Lakeside Athletic Club	EBRPD, Wildcat Canyon	Coordinate with EBRPD to provide access to open space	1	3	4	3	1	11
ES-2	Sobranite Regional Preserve Trail	Castro Ranch Rd	Trail		1	3	2	1	1	8
ES-3a	San Pablo Dam Rd	Mifflin Ave	El Portal Drive	Stripe WB bike lanes	5	3	4	3	1	16
ES-3b	San Pablo Dam Road	Southern City Limits	Castro Ranch Rd	Signage & stripe bike lanes	5	3	4	3	1	16
ES-4	Valley View Road	Pine Hill Dr	Sunset Dr	Signage & stripe bike lanes; Narrow travel lanes and/or Lane Reduction/ Road Diet	2	3	2	3	1	11
ES-5	Castro Ranch Road	Conestoga Way	Country View Dr	Signage & stripe bike lanes	2	3	4	2	1	12
ES-6	May Road	Bruno Rd	Valley View Rd	Signage & Sharrows	2	3	4	3	1	13

Table A-6 | Bay Trail and Creek Trails – Complete Project List

C: Connectivity RA: Regional access
I: Relative ability to implement AC: Activity centers S: Safety

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score (20 points)
BAY TRAIL SEGMENTS										
BT-1	Central Avenue	South from EBRPD Class I trail along Rydin Road	Caltrans Class I trail along I-580, Albany	TRAC proposed design to improve access to Bay Trail; include signal and crosswalk improvements Coordinate with Central Avenue interchange improvements	2	5	4	1	3	15

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Proposed Improvements</i>	<i>C</i>	<i>RA</i>	<i>I</i>	<i>AC</i>	<i>S</i>	<i>Prioritization Score (20 points)</i>
BT-2	S. 32nd Street connection	Regatta Blvd	South side of Meeker Creek	Class I trail from southern end of S. 32nd St. to Bay Trail on south side of Meeker Tidal Creek	2	5	2	2	2	13
BT-3	Brickyard Cove Road	Opposite Mallard Dr	Dornan Dr	Funded for design and construction of Class I trail. Completion expected by Spring 2011	2	5	4	2	3	16
BT-4	Brickyard Cove Road loop south of Miller Knox Regional Shoreline	East end of Dorman Dr	Brickyard Cove Rd	No current plans	2	5	1	2	3	13
BT-5	BNSF railroad right-of-way	Richmond Ave	Keller Beach	After the railroad is ready to abandon this track, consider a Class I pathway along this section.	2	5	1	2	2	12
BT-6	Pt Richmond	Ferry Point Tunnel	Intersection of Garrard Ave & Cutting Blvd	TRAC design includes includes widening sidewalk adjacent to the Plunge to provide Bay Trail connection	5	5	2	2	3	17
BT-7	Tewksbury Avenue	Railroad Ave	Castro St	No current Bay Trail plans Pedestrian & bike improvements to the Pt. Richmond Multimodal depot	5	5	2	2	1	15
BT-8a	Railroad Avenue	Garrard Ave	Richmond Ave	Restore bike lanes that were removed during roadway restriping. Shift centerline and road marking to accommodate bike lanes. Square up the NE corner of Richmond/Railroad Ave to calm auto traffic. Coordinate with TRAC recommendations	2	5	4	2	1	14
BT-8b	Richmond Avenue/ Castro Street	Railroad Ave	Tewksbury Ave	Signage & Sharrows	2	5	4	2	1	14
BT-8c	Richmond Avenue	Garrard Ave	Canal Blvd	Stripe bike lanes along Richmond Avenue and provide pathway connection to Canal Blvd (alignment and easement unknown)	2	5	2	2	1	12
BT-9	Western Drive	Dorman Dr	Chevron Long Wharf	Stripe crosswalks at tunnel entrances on Dorman Dr to accommodate NB bicyclists entering tunnel. Signage & Sharrows along Western Drive. Provide access on west end of drive.	2	5	2	1	1	11

Segment #	Name	From	To	Proposed Improvements	C	RA	I	AC	S	Prioritization Score (20 points)
BT-10	Pt Richmond	Intersection of Castro St & Tewksbury Ave	Existing trail under Richmond/San Rafael Bridge	Planning, design and environmental studies underway for a Class I trail managed by City of Richmond with \$1.6 million in funding. Expected construction cost of \$15 million is not funded.	5	5	2	3	3	18
BT-11	Pt. Richmond - Pt Molate	North side of Richmond/San Rafael Bridge	Point Molate beach at boundary of former Naval Fuel Depot	EBRPD plans to design and build this shoreline Class I trail segment on an easement offered by Chevron. Funds will be needed to supplement those available from Measures CC & WW	2	5	4	1	1	13
BT-12	Pt Molate	Shoreline of former Point Molate Naval Fuel Depot		Under the City of Richmond's Land Disposition Agreement with Upstream Point Molate LLC, construction of a Class I trail is required along the 1.4-mile shoreline when the property is developed for any use.	2	5	4	1	1	13
BT-13	Pt Molate - Pt San Pablo	Northern boundary of former Point Molate Naval Fuel Depot	Southern boundary of City of Richmond's Point San Pablo Property	EBRPD plans to design and build this shoreline Class I trail segment on an easement offered by Chevron. Funds will be needed to supplement those available from Measures CC & WW.	2	5	4	1	1	13
BT-14	Pt Molate - Pt San Pablo	Point San Pablo former Terminal 4		No current plans	2	5	1	1	1	10
BT-15	Pt San Pablo	Northern boundary of City of Richmond's Point San Pablo Property	Point San Pablo Yacht Harbor	EBRPD plans to design and build this shoreline Class I trail segment; however, Chevron has not agreed to provide the needed easement. Funds will be needed to supplement those available from Measures CC & WW	2	5	1	1	1	10
BT-16	Point San Pablo Yacht Harbor			The terms of the BCDC permit issued in 2000 for this yacht harbor require construction and operation of a shoreline Class I trail; however, BCDC has not enforced these requirements	2	5	1	1	1	10
BT-17	Wildcat Creek Trail North	Wildcat Creek Trail western Terminus	Richmond Parkway	EBRPD has designed and funded for construction this 1.1-mile Class I trail. Completion expected by Spring 2011.	5	5	4	1	2	17
BT-18	Goodrick Ave	Richmond Pkwy north	waterfront	No current plans	2	5	1	1	3	12

<i>Segment #</i>	<i>Name</i>	<i>From</i>	<i>To</i>	<i>Proposed Improvements</i>	<i>C</i>	<i>RA</i>	<i>I</i>	<i>AC</i>	<i>S</i>	<i>Prioritization Score (20 points)</i>
BT-19	Goodrick Ave	Goodrick Ave	Bay View Trail in Point Pinole Regional Shoreline	Preliminary design and environmental studies are underway to close Bay Trail gap while restoring natural habitat. Funds will be needed to supplement those available from Measures CC & WW to complete the expected \$7 million project in stages during the 2013 - 2015 period	2	5	4	1	3	15
BT-20	Former Freethy Industrial Park	SW to Richmond Pkwy	North end of Goodrick Ave	No current plans	2	5	1	1	3	12
BT-21	Point Pinole Regional Shoreline	Point Pinole Regional Shoreline	Point Wilson, Pinole	EBRPD is working toward obtaining an easement from UP railroad as required under terms of UP's merger with SP. Design and construction funds will be needed to supplement those available from Measures CC & WW	2	5	2	1	3	13
BT-22	Atlas Road	Richmond Pkwy	Point Pinole Regional Park	Pathway connection	5	5	2	1	3	16

CREEK TRAIL SEGMENTS

CT-1	Brookside Trail	Giant Rd	City Limit/RR tracks	Shared Use Pathway connection	2	3	2	1	3	11
CT-2	Creek Trail	I-80	Contra Costa College	Shared Use Path	2	3	2	1	3	11
CT-3	Wildcat Creek Trail	Giant Rd	City Limit	Pathway connection	2	3	2	1	3	11
CT-4	Wildcat Creek Trail	Richmond Parkway	N/A	Signalize path crossing of Wildcat Creek Trail at Richmond Parkway	5	3	3	1	3	15
CT-5	Cerrito Creek Trail	Southern edge of Pacific East Mall	N/A	Alignment along the north bank of Cerrito Creek	5	5	4	3	3	20

B . Design Guidelines

This chapter identifies guidelines for the design of bikeways and bicycle parking facilities in the City of Richmond. The appropriate design of bicycle facilities is an integral component of encouraging the public to bicycle for commuting and recreational purposes. Good design affects the experience, enjoyment and comfort for bicyclists, and should ultimately provide the highest level of safety possible for all road and shared-use path users. The Richmond Bike Plan envisions a two-part bike network, a one that accommodates utilitarian trips, such as those between home and work, and one that accommodates recreational trips.

Bikeway planning and design in California typically relies on the guidelines and design standards established by Caltrans and documented in “Chapter 1000: Bikeway Planning and Design” of the Highway Design Manual (California Department of Transportation, 2006). Chapter 1000 follows standards developed by the American

Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) and identifies specific design standards for various conditions and bikeway-to-roadway relationships. These standards provide a good framework for future implementation, but depending on the circumstances may not always be feasible given specific constraints. Likewise, these standards can often be expanded. Whatever the case may be, local jurisdictions must be protected from liability concerns so most agencies adopt the Caltrans or AASHTO standards as a minimum. Caltrans standards provide for three distinct types of bikeway facilities, as generally described below.

This chapter presents design guidelines for the following topics:

Class I Shared-Use Path

- Shared-Use Path Structures
- Crossing Treatments
- Rails-with-Trails
- Path Amenities

Class II Bike Lanes

- Bike lanes next to Parallel Parking
- Bike lanes next to Angled Parking
- Bike lanes Without Parking
- Bike lanes on Hills
- Bike lanes at Intersections
- Bike Lane Markings
- Treatments at Interchanges, Bridges and Tunnels
- Bike Loops and Detectors

Class III Bike Routes

- Bike Boulevards
- Share the Road Markings or “Sharrows”
- “Super Sharrow Lanes”

Bike Parking

- In-Street/Sidewalk Parking
- Bicycle Lockers
- Enclosed Facilities

Bicycle Signage

- Wayfinding/Destination Signage
- Signs for Shared Roadways

Maintenance Standards

- Utility Covers and Construction Plates

Types of Bicycle Facilities

Class I: Bike Path/Shared Use Path

These facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicles cross-flow minimized.

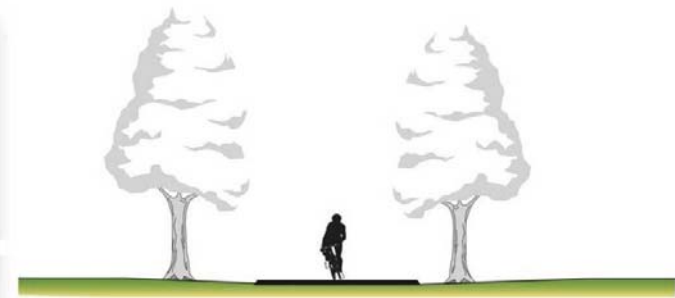
Class II: Bike Lane

Bike lanes provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.

Class III: Bike Route

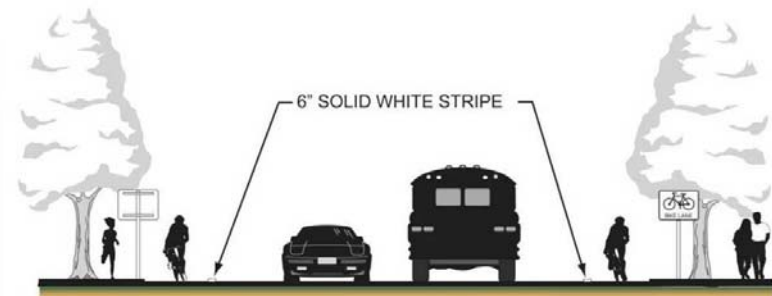
These bikeways provide a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles.

Figure B-1 | Bikeway facility types



CLASS I BIKEWAY (Bike Path)

Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with crossflow minimized.



CLASS II BIKEWAY (Bike Lane)

Provides a striped lane for one-way bike travel on a street or highway.



CLASS III BIKEWAY (Bike Route)

Provides for shared use with pedestrian or motor vehicle traffic.

CLASS I SHARED-USE PATH

Class I bikeways are typically called bike paths, multi-use or shared use paths and are completely separated from roads by a buffers (five feet or more) or barriers. Cross traffic by motor vehicles should be minimized along bike paths to avoid conflicts. Bike paths can offer opportunities not provided by the road system by serving as both recreational areas and/or desirable commuter routes.

According to the AASHTO standards, two-way bicycle paths should be ten feet wide under most conditions, with a minimum two-foot wide graded area on both sides. In constrained areas, an eight-foot wide path may be adequate. Bike paths are usually shared with pedestrians and if pedestrian use is expected to be significant, the path should be greater than ten feet, preferably twelve feet wide.

Where possible, bike paths should have an adjacent four-foot wide unpaved area to accommodate joggers. This jogging path should be placed on the side with the best view, such as adjacent to the waterfront or other vista (see figure on the next page). Where equestrians are expected a separate facility should be provided.

Decomposed granite, which is a better running surface for preventing injuries, is the preferred surface type for side areas and jogging path, while asphaltic concrete or Portland cement concrete should be used for the bike path. A yellow centerline stripe may be used to separate opposite directions of travel. A centerline strip is particularly beneficial to bicycle commuters who may use unlighted bike paths after dark.

Sidewalks and meandering paths are usually not appropriate to serve as bike paths because they are primarily intended to serve pedestrians, generally do not meet Caltrans' design standards, and do not minim-

ize motor vehicle cross flows. Where a shared use path is parallel and adjacent to a roadway, there should be a 5-foot or greater width separating the path from the edge of roadway, or a physical barrier of sufficient height should be installed.

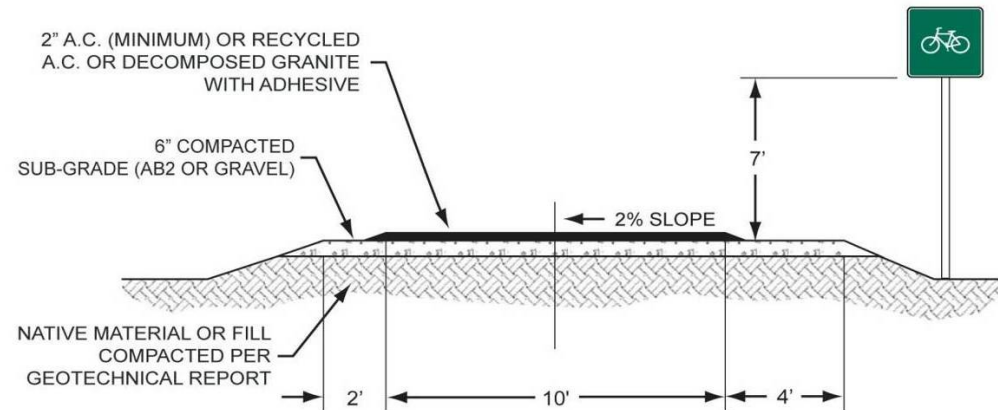
Table B-2 | Standards for Class I Facilities

	AASHTO Standards	Preferred Standards**
Minimum Width	8.0'	10.0'
Vertical Clearance	8.0'	8.0'
Horizontal Clearance	2.0'	3.0'
Maximum Cross Slope	2.0%	2.0%

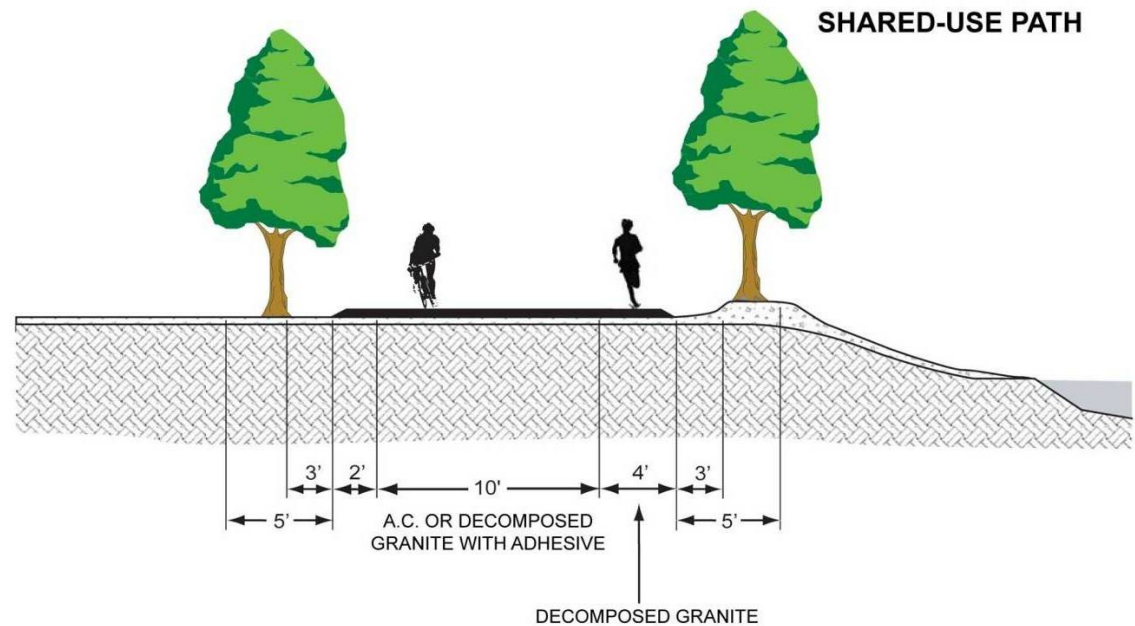
**The City of Richmond should decide what their preferred minimum standards are, and if they should exceed AASHTO standards.

Figure B-2 | Typical Class I path

BIKE PATH



SHARED-USE PATH



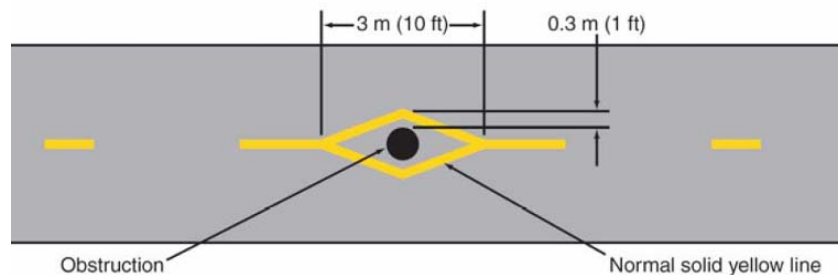
Shared Use Path Structures

The following sections present typical design features found on Class I facilities.

Bollards

Bollards can be placed at bike path access points to separate the path from motor vehicles and to warn and slow bicyclists as they approach street crossings. The diagonal layout of bollards will make the space between the bollards appear narrower, slowing bicyclists and deterring motorcyclists from entering the trail. The bollards are spaced to provide access by people using wheelchairs (generally 5' apart). A trail sign post can be incorporated into the bollard layout. The image below shows the recommended striping and placement for bollards on shared use paths. Careful consideration should be taken before installing bollards as they can become obstacles for bicycles and result in fixed-object collisions. Where need for bollards is a possibility, but uncertain, install bollard-ready infrastructure, but delay installation of the bollard until a need is demonstrated.

Figure B-3 | Typical Bollard Design



Split Trailway

New 2009 California MUTCD standards discourage the use of bollards if other options are practical. If feasible, the path should be split by direction to go around a small center landscape feature. Rather than one 8' or 10' trail, the trail would be split into two 4' or 5' paths. This feature not only narrows the trail and prevent vehicles from entering, but also introduces a lateral shift for cyclists, encouraging slower speeds in conflict zones.

Bridges

Bridges will be required wherever bike paths cross creeks and drainages. Crossings can utilize pre-fabricated bridges made from self-weathering steel with wood decks. Bridges should be a minimum of 8' wide (between handrails) and preferably as wide as the approaching trails. Openings between railings should be 4" maximum. Railing height should be a minimum of 42" high.

Fencing

Fencing may be necessary on some bike paths to prevent path users from trespassing on adjacent lands, or to protect the user from dangerous areas. In areas near railway lines, safety may be a concern. Fencing should maintain safety without compromising security. They should be tall enough to prevent trespassing, but they should maintain clear sight lights from the trail to the adjacent land uses. In areas where private residences are passed, privacy may be a concern. Screen fences should be used to maintain privacy of residents. Screen fences can be made of wood, concrete block or chain link if combined with vine planting. However, if fencing is used, there must be at least 2' of lateral clearance from the edge of the bike path.

Curb ramps

Where curbs are present, curb ramps should be provided and be as wide as the entire path.

Crossing Treatments

The following guidance is derived from the AASHTO *Guide to the Development of Bicycle Facilities*, the City of Seattle's *Bicycle Master Plan*, and the City of San Francisco's *Supplemental Bicycle Design Guidelines*.

Signs on Paths

Some jurisdictions have used STOP signs and BIKES MUST DISMOUNT signs to regulate bike traffic on shared-use paths. These signs are generally ineffective and result in frequent violations and disregard for other types of path signage.

Shared-use path crossings come in many configurations, with many variables: the number of roadway lanes to be crossed, divided or undivided roadways, number of approach legs, the speeds and volumes of traffic, and traffic controls that range from uncontrolled to yield, stop or signal controlled. Each intersection is unique and requires

engineering judgment to determine the appropriate intersection treatment. The safe and convenient passage of all modes through the intersection is the primary design objective. Regardless of whether a pathway crosses a roadway at an existing roadway intersection, or at a new midblock location, the principles that apply to general pedestrian safety at crossings (controlled and uncontrolled) are transferable to pathway intersection design.

When shared use paths cross roadways at intersections, the path should generally be assigned the same traffic control as the parallel

roadway (i.e., if the adjacent roadway has a green signal, the path should also have a green/walk signal or if the parallel roadway is assigned the right-of-way with a stop or yield sign for the intersecting street, the path should also be given priority). At signalized intersections, if the parallel roadway has signals that are set to recall to green every cycle, the pedestrian signal heads for the path should generally be set to recall to walk. Countdown pedestrian signals should be installed at all signalized path crossings as signal heads are replaced. As required by the Manual on Uniform Traffic Control Devices, the walk signal for any path shall not conflict with a protected left- or right-turn interval. Bicyclists benefit from the safe passage that pedestrian signals provide by having a dedicated time during which to cross a roadway without having to yield to on-coming vehicle traffic.

Consideration should be given to providing a leading pedestrian interval at path crossings (i.e., three seconds of green/walk signal time are given to path users before any potentially-conflicting motor vehicle movements are given a green signal). This allows pedestrians and bicyclists to have a head start into the roadway to become more visible to turning traffic.

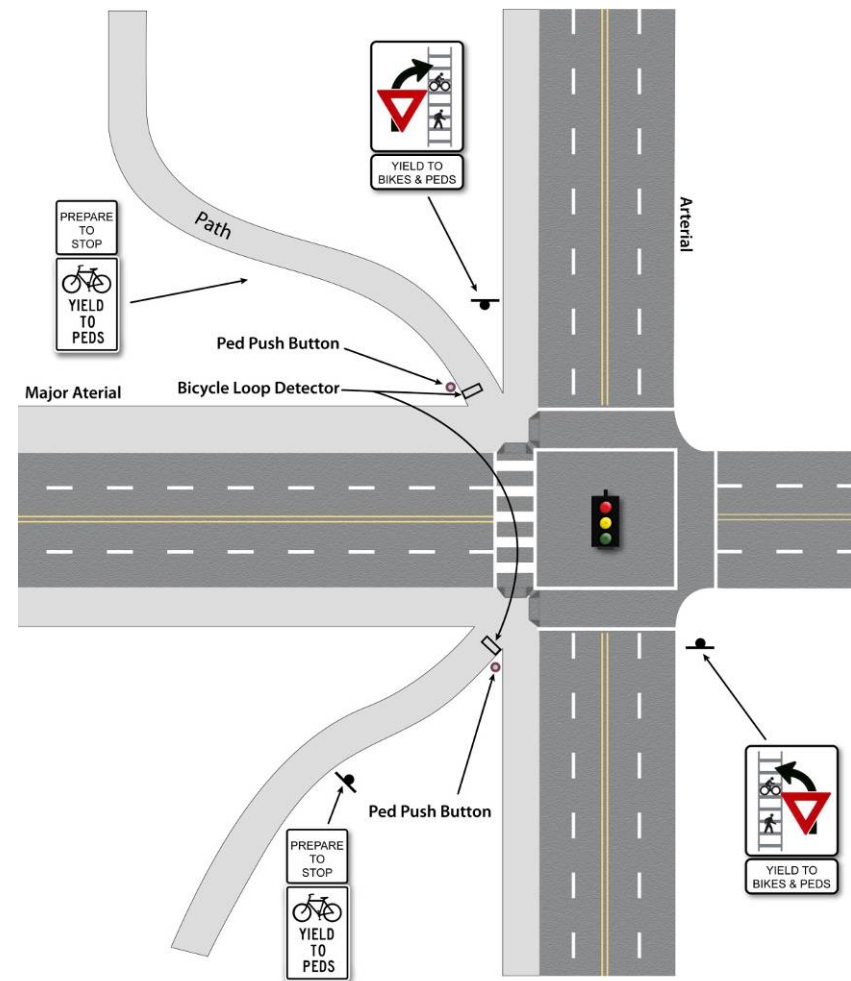


Where the signals for the parallel roadway are actuated, the path crossing will also need to be actuated. For shared-use path crossings, the minimum WALK interval may be 9-12 seconds to accommodate increased flow. The USE PED SIGNAL sign should be used at shared-use path crossings at signalized intersections. Pedestrian pushbuttons should be located within easy reach of both pedestrians and bicyclists, who should not have to dis-

mount to reach the pushbutton.

The figure on this page illustrates the preferred approach for a shared use path at a controlled intersection. Paths should cross at the intersection to encourage use of the intersection crossing and have path users in the location where they are most anticipated. In many cases, a path will be separated from a roadway by between 20 and 50 feet. Locating path crossings along these alignments (that is 20 to 50 feet away from the intersection) creates a condition where vehicles do not expect to encounter a path crossing and vehicles leaving the intersection are accelerating away from it when they cross the path crossing. For signalized trail crossing, an advance loop detector within 100 feet of the intersection should be considered, so bicyclists can approach the intersection slowly but without having to stop.

Figure B-4 | Shared Use Path Approach to at a Signalized Intersection



Unsignalized Intersections

At unsignalized or stop controlled locations, an engineering study should be conducted to determine an appropriate way to control cross bike and pedestrian traffic. The following are general guidelines that can be used for these locations:

- If paths cross at intersections with all way stops, stop signs should be placed at each path approach.
- Consideration should be given to removing stop signs along continuous paths and their parallel roadways and controlling intersecting roadways with stop signs. An engineering study should be conducted before removing or adding any stop signs.
- At intersections with STOP signs controlling only one of the approaches, the trail should be assigned the same right-of-way as the parallel street. Stop signs should not be placed on the path approaches to the intersecting roadway if the parallel street has no stop signs.
- If the two streets have the same roadway classification, and the stop signs face the intersecting street that is parallel to the path, consideration should be given to reversing the stop sign placement, giving the right-of-way to the path and the parallel street. An engineering study should be conducted before reversing the stop sign placement.
- The decision of whether to use a traffic signal at a mid-block crossing should be primarily based on the latest version of the MUTCD Pedestrian Signal warrants.

At mid-block crossings, all path users (including bicyclists) should be included in calculating the “pedestrian volume” for the warrant procedure. While the CA MUTCD has not yet been updated with revised pedestrian-related signal warrants, the 2009 national MUTCD contains these revised warrants and should be used. When a path crossing

meets the warrants, there may be other reasons why a signal is not necessary at the crossing. Where a decision has been made not to install a traffic signal at a mid-block path crossing, STOP or YIELD signs should be used to assign the right-of-way to the path or the roadway. The assignment of priority at a shared-use path/roadway intersection should be assigned with consideration of the relative importance of the path and the roadway; the relative volumes of path and roadway traffic; and the relative speeds of path and roadway users.

Bicycle Signal Heads



Image: Bike Signal Head Adjacent to Traffic Signal Head

Bicycle signal heads permit an exclusive bicycle-only signal phase and movement at signalized intersections. This takes the form of a new signal head installed with red, amber and green bicycle indications. Bicycle signals can be actuated with bicycle sensitive loop detectors, video detection or push buttons. Bicycle signals are an approved traffic control device in California, described in Part 4 and 9 of the CA-MUTCD. The City of Richmond may install bike signals at intersections with heavy bike

volumes, on bike paths adjacent to intersections where heavy bike traffic in the crosswalk may conflict with turning vehicles, or at three-legged intersections where bikes may enter or exit a bike path at the intersection. Bike signal warrants could be considered when bike vo-

lumes exceed 50 per hour and vehicle volumes are greater than 1,000 vehicles per hour, or in locations that have a history of bicycle vehicle collisions (>2 in one calendar year), or in locations where a multi-use path intersects a roadway.

Rails with Trails



Rail-with-Trail right-of-way adjacent to light-rail lines in Minneapolis, Minnesota. (source: Stuart Macdonald, 2003-06)

Rail corridors provide opportunities for pathways, especially in dense urban settings where it may be difficult to find land for new paths or roadways that provide safe and efficient commuter bike corridors. Successful rail-with-trail projects have been implemented in over 60 communities throughout the US. The following guidelines are based on the best practices identified in the U.S. Department of Transportation Federal Highway Administration's *Rails-With-Trails: Lessons Learned* (2002) report and AASHTO. Path designers should work closely with railroad operations and maintenance staff to achieve a suitable trail design.

Setback

Setback refers to the distance between the paved edge of a path and the centerline of the active railroad track. According to the FHWA's

Rail corridors provide opportunities for pathways, especially in dense urban settings where it may be difficult to find land for new paths or roadways that provide safe and efficient commuter bike corridors. Successful rail-with-trail projects have been implemented in over 60 communities throughout the US. The follow-

Rails-with-Trail: Best Practices Report (2001), setback should be based on type, speed and frequency of trains; the separation technique; topography; sight distance and maintenance requirements. Paths adjacent



Rail-with-trail section of the Great Allegheny Passage between Washington, DC and Pittsburgh, Pennsylvania.

to low frequency and slow moving trains could be located as close as 10' from the track centerline; paths adjacent to higher-speed trains or more frequent trains may require setbacks up to 50'. Vertical separation, such as fencing, walls, or landscaping, as well as natural features such as grades, thickets, and/or bodies

of water, may allow for reduced setbacks. The absolute minimum setback must keep rail-path users outside of the "dynamic envelope," or operating space, of the path. According to the MUTCD, the dynamic envelope is "the clearance required for the train and its cargo to overhang due to any combination of loading, lateral motion or suspension failure, and includes the area swept by a turning train.

Separation

Typical barriers include fencing, vegetation, vertical grades, and drainage ditches. Depending on the safety and trespassing risk, typical fence separation can range in height from 3' to over 10'. In general, any separation should impede unnecessary access to rail lines and channel users to legal crossings. Fence design should also consider issues with crime, and it may be important to choose fencing or other

physical separators that maintain sightlines between the adjacent land uses and the rail lines and pathway. Vegetation, grades and ditches may be used as a barrier between the rail-trail and an active rail when:

- The rail-path (not including shoulder) is located farther than 25' from the nearest rail line, or
- The vertical separation between the surface of the rail-path and the track is greater than 10'.

The development of a rail-path may affect adjacent rail operation; therefore, the barrier type, material and location should be determined jointly by interested parties and should use the FHWA *Rails-with-Trail: Lessons Learned* (2002) as guidance. The table below summarizes the recommended separation for various facility types.

Table B-2 | Recommended separation from active rail lines

	Setting	Minimum	Recommended**
High-Density/High-Speed Lines (11 or more trains per day with speeds exceeding 45 mph)	Typical Conditions	15'	25'
	Constrained areas (e.g., bridges, trestles, cut/fill)	15' with vertical or other separation	15'
	With vertical separation of at least 10'	20'	25'
Medium-Density/Medium-Speed Lines (fewer than 11 trains per day with speeds not to exceed 45 mph)	Typical Conditions	15'	25'
	Constrained areas (e.g., bridges, trestles, cut/fill)	11' with vertical or other separation	25'
	In areas with extensive trespassing history (>100 persons per day)	11' with vertical or other separation	25'
Low-Density/Low-Speed Lines (less than one train per day; maximum speed of 35 mph)	Typical Conditions	11'	25'
	Constrained areas (e.g., bridges, trestles, cut/fill)	11' with vertical or other separation	25'

Source: *Rail-with-Trails: Lessons Learned*; Table 5.2 Minimum Setbacks; Vermont Department of Transportation Pedestrian and Bicycle Facility Planning and Design Manual

**The City of Richmond should decide what their preferred minimum standards are based after discussing potential path designs with rail operators.

Crossings



Rail-with-Trail crossing adjacent to light-rail lines in Minneapolis, Minnesota. (source: Stuart Macdonald, 2003-06)

Path crossings at active rail tracks should follow the same recommendations for shared use paths at roadway crossings. The appropriate design depends in part on expected train operations, and should consider train speed, frequency, type, number of tracks, stopping distance and

number of tracks. The following elements should be considered in the design of the crossing:

- When an at-grade rail-trail crossing intersects a roadway near a roadway intersection, consideration should be given to diverting the crossing to the roadway intersection and treat it as a parallel crossing or pedestrian crossing.
- Sight distance: The pedestrian or bicyclist should have an unobstructed view down the track to determine if sufficient time exists to cross the rail lines. In site distance is limited, additional passive and active devices should be included in the design of the crossing, including, but not limited to, exit swing gates, barriers, pavement markings and texture, message signs, flashing signals, audible devices, or signals. Even in locations with additional treatments, site distance should be maximized based on the FHWA's Guidance on Traffic Control Devices at Highway-Rail Grade Crossings. Site distance calculations should include considerations for deci-

sion/reaction distance of the pedestrian or cyclist, clearance from the track, distance between different tracks, and clearance on the opposite side of the track.

- Track Angle: As shown in the figure on the following page, the design of the crossing should obtain a perpendicular approach to the track to maximize site distance and minimize the potential for narrow wheeled vehicles to be trapped in the track rails.
- Width: The minimum width of the path should be 48 inches; however, typical railroad crossings with curb-mounted gates and warning devices, the minimum distance from the face of the curb to the centerline of the device is 51 inches. Therefore, crossings may need to be up to 11' 2" wide at rail crossings.
- Channelization: Crossings should be well marked to reduce the potential for illegal track crossings. Barriers may be recommended to assist in channelization; however, they many need to be sized to maintain appropriate site distance of approaching trains.
- Other treatments, such as swing gates, edge lines, and detectible surfaces are also desirable to improve crossing safety.

Figure B-5 | At-grade rail crossings

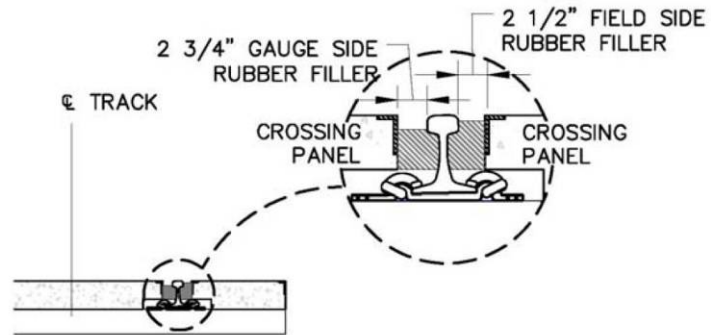
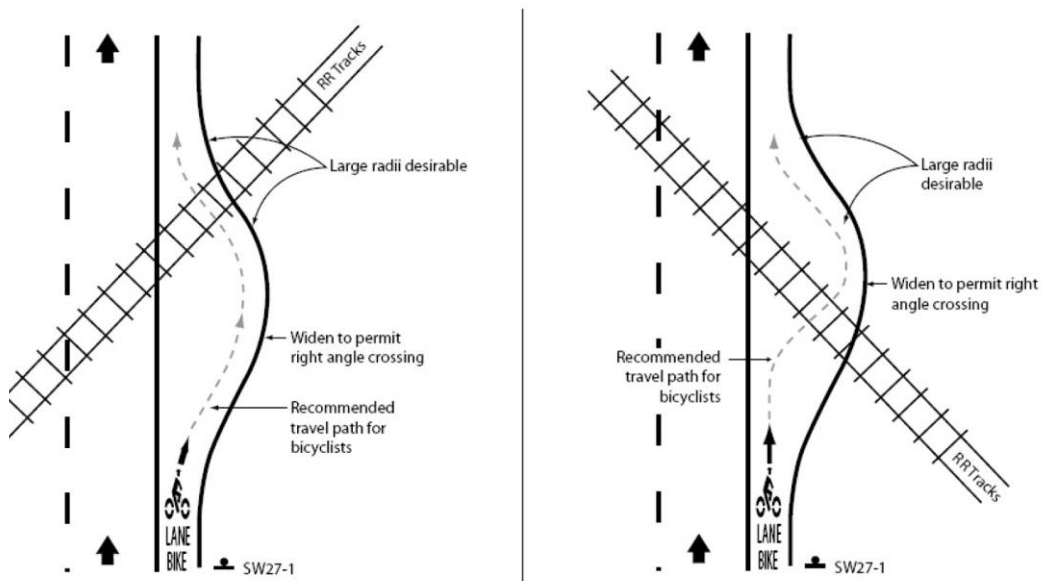
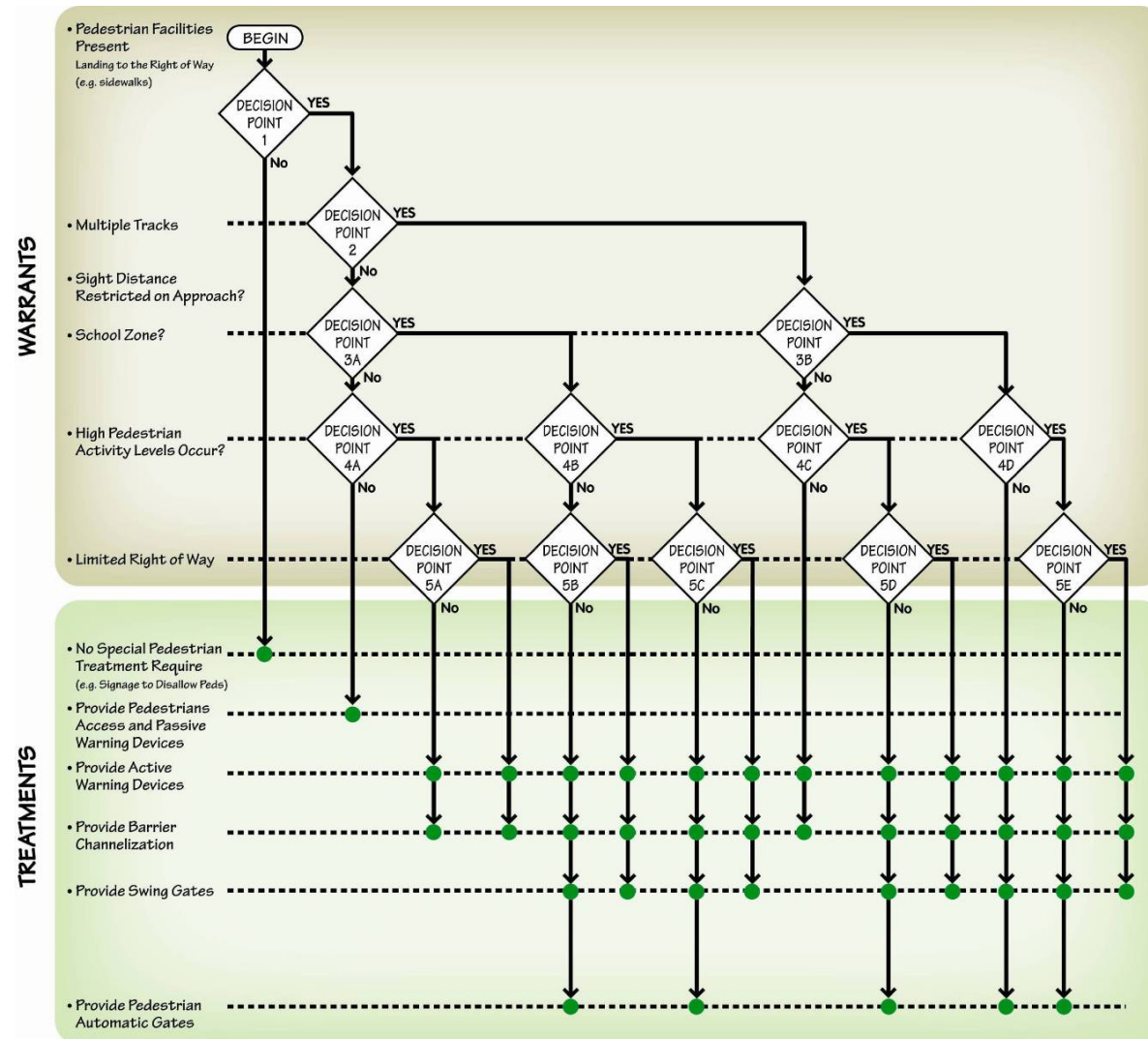


Figure C-5: Rubberized railroad crossing
(Caltrain Standard Drawing 2151)



The following decision tree was developed by the California Public Utilities Commission as standard guidance for treatments at rail crossings.

Figure B-6 | Decision tree for treatments at rail crossings



Source: California Utilities Commission, 2008

Shared-Use Path Amenities

Furnishings along a shared-use path should be concentrated at specific points to form gathering nodes. These nodes occur at intersections between different path types, special viewpoints, or at distinctive landscape features. Shared-use path support facilities consist of staging areas, seating and tables, weather-protection structures, drinking fountains, waste receptacles, fencing, bike racks, interpretive and directional signage and restrooms.

Staging Areas

Staging areas should be provided at path entrances. These areas should include basic information such as directional information and signage, bicycle parking, seating and waste receptacles. Restrooms, water fountains, weather structures should be provided where practical and feasible. At path entrances where a substantial number of users are likely to drive, a parking lot should be provided; however, vehicle parking should be minimized to encourage non-motorized access to recreational facilities.

Rest Areas

Rest areas are portions of paths that are wide enough to provide wheelchair users and others a place to rest while on trails without blocking continuing traffic. Rest areas are more effective when placed at intermediate points, scenic lookouts, or near other trail amenities. Most rest areas will have seating, shade, a place to rest bicycles, and waste receptacles. On longer paths, restrooms and/or water fountains may be desirable where feasible. The California State Parks Guidelines calls for rest areas every 200' on outdoor recreational routes with grades of no steeper than 8.3%. Accessible paths at steeper grades may require resting areas at greater frequency.

Seating

Benches provide people of all ages and abilities a place to sit and rest along trails. Seating should be placed away from the path, at least 3' from the trail edge, to allow room for people to sit with outstretched legs. An area adjacent to the bench should be able to accommodate a wheelchair.

Waste

Trash receptacles should be installed along bike paths at regular intervals, as well as at rest areas, path entrances, and seating areas, to encourage proper waste disposal and discourage littering.

CLASS II BIKE LANES



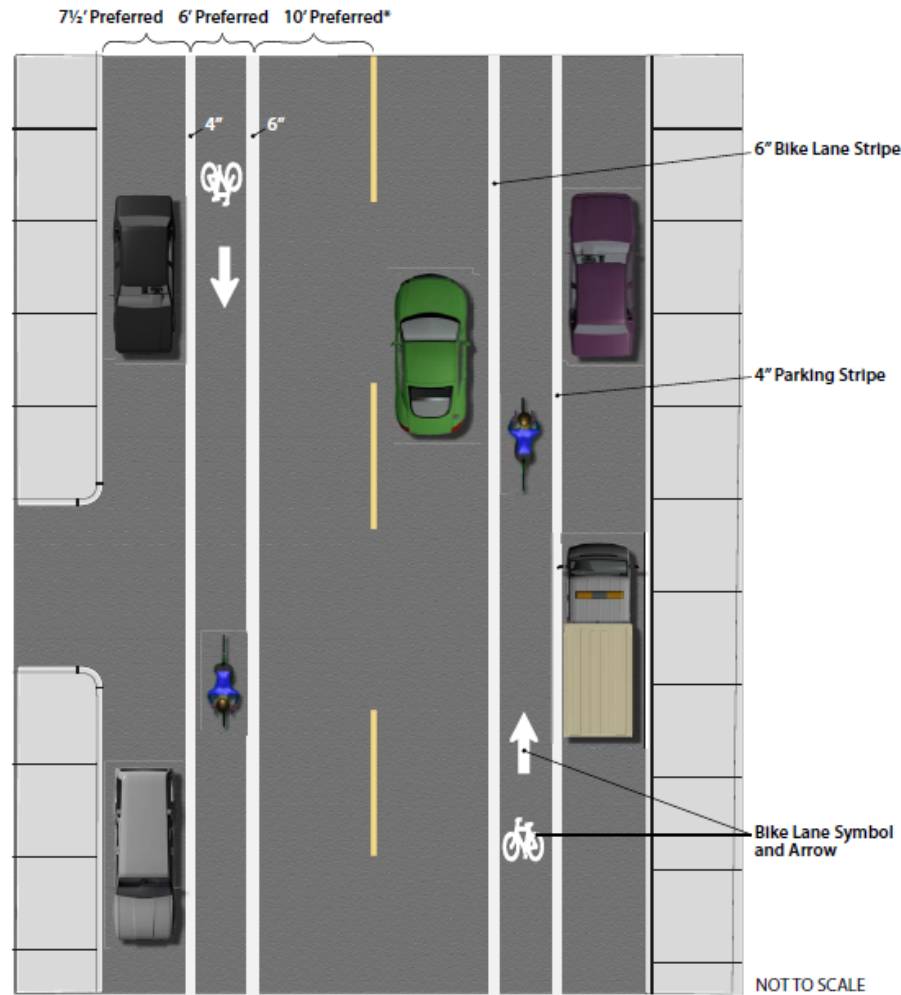
This section includes guidelines for Class II bicycle lanes along roadways and at intersections. Most riders benefit by having a lane that is separate from motor vehicle traffic, and bicycle lanes are typically used on streets with higher traffic volumes or greater speeds.

Standards for Class II Facilities

The figures on the following pages illustrate the preferred widths for bicycle lanes in the following situations:

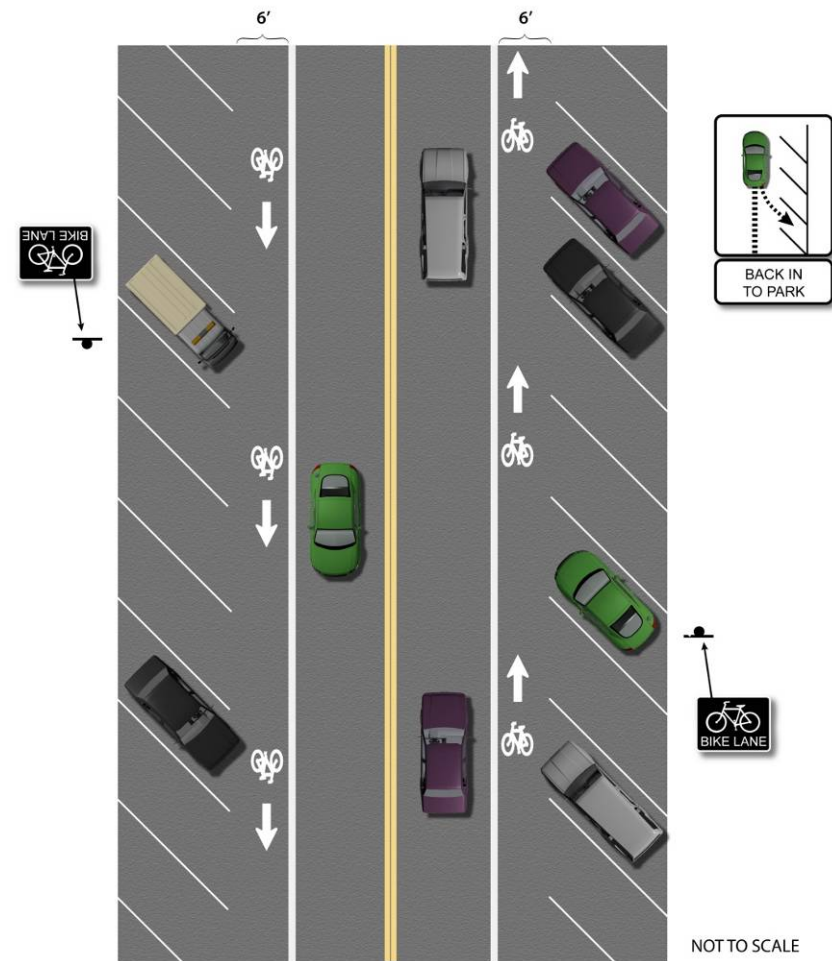
- Next to Parallel Parking
- Next to Back In Angled Parking*
- Without Parking
- Buffered Bike Lane

Figure B-7 | Bike Lanes Adjacent to Parallel Parking



*11' minimum width for outside travel lanes along bus routes

Figure B-8 | Bicycle Lanes Adjacent to Back-In Angled Parking



* The City of Richmond uses conventional front-in angled parking as a standard practice. Back-in angled parking may be considered in a pilot location where appropriate.

Figure B-9 | Bicycle Lanes without Parking

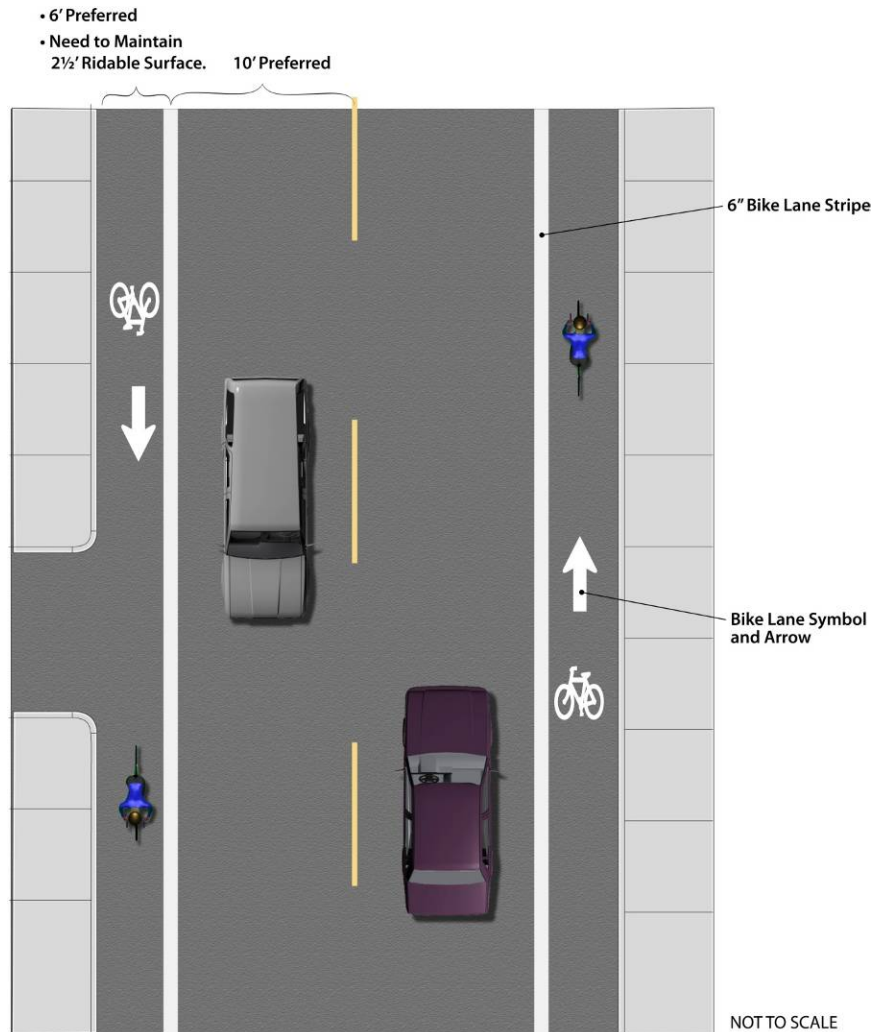
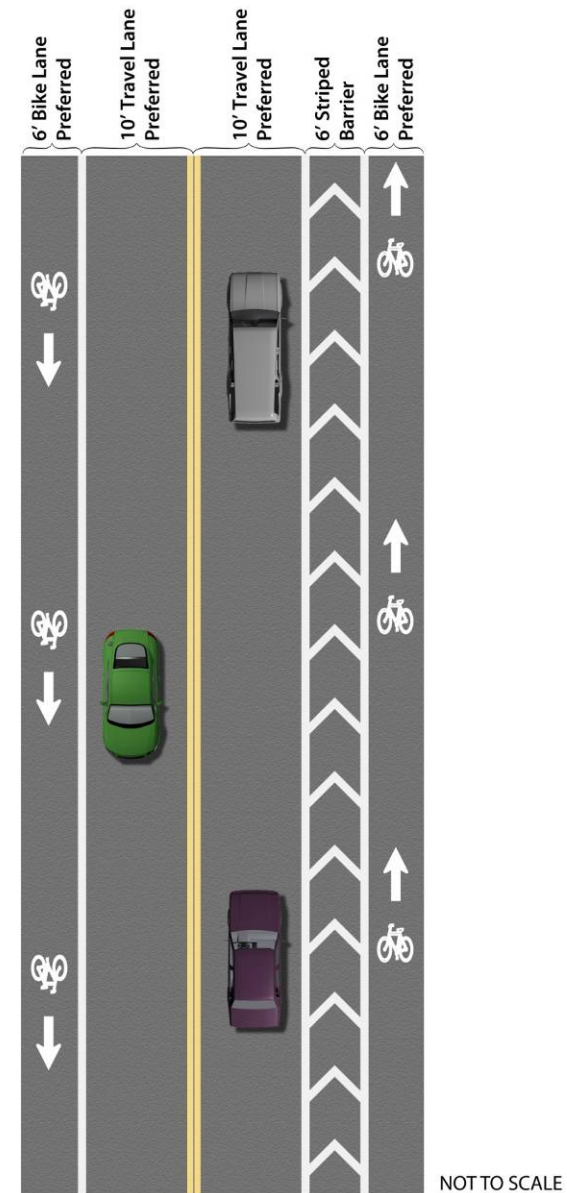


Figure B-10 | Buffered Bike Lanes



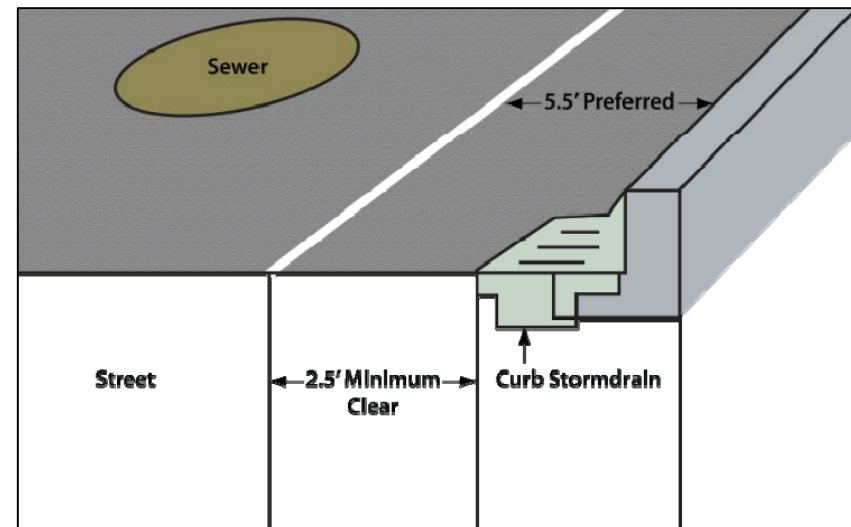
Standard Bike Lane: Bike lanes should be designed to meet Caltrans standards, which require a minimum width of five feet. The preferred bike lane width is 6 feet. The preferred vehicle travel lane width is 10 feet; however, AC Transit prefers that any roadway with bus routes have 11 foot travel lanes. Signs that say BIKES WRONG WAY may be used on the back of bike lane signs or on separate posts to discourage wrong way riding.

Shared Bike/Parking Lane: If a bike lane is shared with a parking lane, the combined lane should be a minimum of 12.5 feet, with 13 feet desirable. This minimum combined lane should be striped with a 6 foot bicycle lane and 7 foot parking lane. The optimum combined lane should be a 6 bike lane and a seven-foot parking lane.

Bike Lane without Parking: In places where there is no on-street parking, the six foot preferred width applies. In exceptional circumstances where no other reasonable options exist or retrofit situations, a 4 foot minimum is allowed as long as there is no on-street parking.

Gutter Pans & Bike Lanes: Where drainage or other obstructions constrict clearance between the vehicle travel lane and stormdrains, designers should take care to maintain a 2.5 foot clear longitudinal surface, free from drainage grates and other obstructions in order to give the cyclist adequate width to ride. It is preferable not to consider the gutter pan as clear surface.

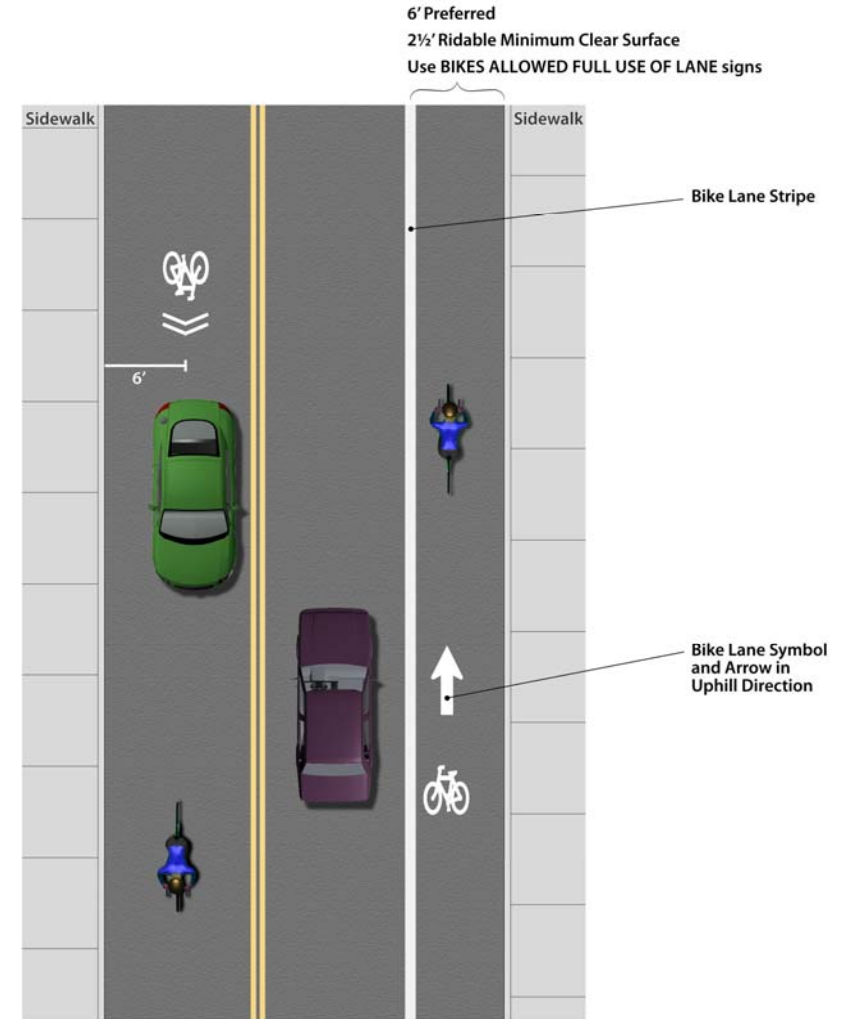
Figure B-11 | Location of Bike Lane with Curb and Gutter



Bike Lanes on Hills

In most cases, bike lanes should be provided on both sides of a two-way street; however, in cases where roadways have steep grades, a bike lane in the uphill direction and shared lane markings (sharrows) in the downhill direction would be considered acceptable (AASHTO, 2010). On narrower roadways, sharrows may be placed in the center of the lane to discourage vehicles from passing cyclists. **BIKES ALLOWED FULL USE OF LANE** signage may be appropriate on downhill segments. Posted speed limits of 25 mph or lower are preferred.

Figure B-12 | Climbing Lanes



NOT TO SCALE

Bike Lanes at Intersections

Nationally, the majority of collisions between motorists and bicyclists occur at intersections. While design guidance for bike lanes acknowledges that intersections are often constrained by the desire for addition turn lanes for autos and allows engineers to drop bike lanes at intersections, this practice is not recommended. There are several engineering treatments to significantly reduce conflicts at intersections.

Caltrans provides recommended intersection treatments in Chapter 1000 of the Highway Design Manual including bike lane “pockets” and loop detectors. Bike lane pockets between right-turn lanes and through lanes should be provided where available lane width allows. Where there is inadequate space for a separate bicycle lane and right-turn lane, the designer should consider the use of a combined lane, shown in the figure on the following page. The City of Eugene, Oregon evaluated this design and concluded that it was easy for cyclists to use. A majority of the cyclists using the facility felt that it was no different from a standard right-turn lane and bicycle lane.¹ An alternate treatment is a sharrow, or “shared right of way” marking, in the through lane adjacent to the right-turn lane.

The figure on the following page shows the appropriate location and use of loop detector stencils at intersections and typical striping and lane configurations for bike lanes and loop detectors at a multi-lane intersection. Figure B-14 presents several options for the treatment of Class II lanes approaching intersections with right-turn lanes.

¹ Evaluation of a Combined Bicycle Lane/Right Turn Lane in Eugene, Oregon, Federal Highway Administration, 2000

On the Horizon: Bike Boxes

Bicycle boxes are used at signalized intersections to create a dedicated space for cyclists while waiting for a green light. They offer the cyclist a “head start” and allow cyclists to position themselves for various movements (left turns, for instance). They also allow cyclists to avoid conflicts with right-turning vehicles.

Bike boxes have been used in New York, Tuscon (AZ), Portland, Eugene, and recently in San Francisco. Bike boxes work best at locations where they are self-enforced, that is, where there is a cyclist in the bike box during the red phase for a majority of the time. Therefore, a good baseline for a bike box would be a location with 90-120 bicycles or more per hour.

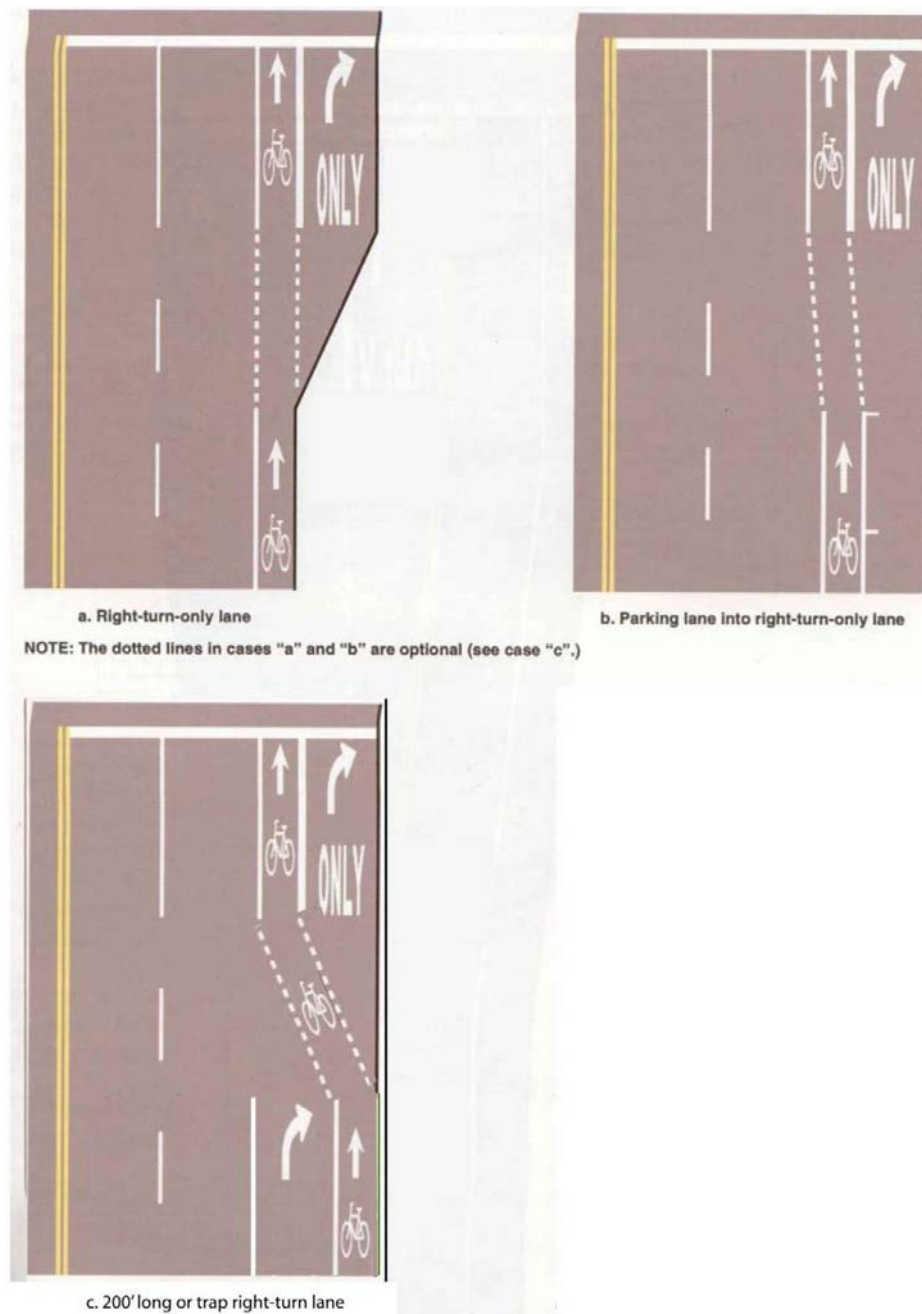


Bike Lane Markings

Pavement stencils should be reflectorized and be capable of maintaining an appropriate skid resistance under rainy or wet conditions to maximize safety for bicyclists. The minimum coefficient of friction should be 0.30. Thermoplastic can meet all of these requirements. It is optimized when the composition has been modified with crushed glass to increase the coefficient of friction and the maximum thickness is no larger than 100 mils (2.5 mm).

The Caltrans standard for placement of bicycle lane stencils states that markings should be on the far side of each intersection and at other locations as desired. Generally, bicycle lane markings should be provided at transition points, particularly where the bicycle lane disappears and reappears, as it transitions from curb side to the left side of the right-turn lane. Otherwise, place them at least every 500 feet or once per block. Symbols shown in the figures are for illustration purposes and should not be used as spacing or placement guidelines.

Figure B-14 | Bike Lanes at Right Turn



Colored Bicycle Lanes: Colored bike lanes can be used in high-conflict areas to alert motorists to the presence of bicyclists and bike lanes. Cities including Portland, Oregon and New York City have successfully experimented with colored bike lanes at highway interchanges and locations where drivers have otherwise encroached on bicycle lanes. These lanes can be painted or treated with thermoplastic. The City of Richmond may consider installing a trial colored bike lane before expanding the use of the treatment throughout the City.



*Image: Green bike lane at intersection.
Also shown: Bike-only left turn pocket.*

Skip-Stripe: At intersections with moderate to high bicycle volumes, or at intersections where bicyclists may need to reposition themselves to continue on the bike lane, it may be advisable to stripe the bike lane through the intersection using dashed lines. This “skip-striping” directs cyclists to the bike lane and increases the visibility of cyclists to motorists traveling through the intersection. To identify that the markings are for bicyclists, the City of Richmond may consider striping chevrons or sharrows through the intersection as well.



On the Horizon: Cycle Tracks

Cycle tracks, also known as separated on-street bike lanes, provide a buffer between bikes and cars. These facilities are useful along streets with moderate to high bicycle volumes and relatively few driveways or intersections. New York City has recently and extensively used separated on-street bikeways to improve bicycling conditions on several key corridors.

The New York Department of Transportation has experimented with two forms of separated bikeways. The first physically separates the bike lane from vehicle traffic and the bike lane is positioned between the sidewalk and the parking lane. At intersections, bikes receive a signal that allows cyclists to proceed without conflicting with turning vehicles. The second treatment positions the bike lane between the travel lane and the parking lane; however, a striped painted median separates the travel lane from the bike lane. The New York Street Design Manual recommends allowing at least 8' of space to accommodate the separated bike lane and the adjacent separation marking or structure.



Images: (left) 9th Avenue, New York City (RL Layman); (right) Greenwich Street (L Alter)

Treatments at Highway Interchanges

Bicycle and pedestrian routes at highway interchanges require special treatment to ensure the safety and comfort for all road users. Fast moving traffic, highway on and off-ramps and wide travel lanes make interchanges difficult areas for bicyclists and pedestrians to navigate. The guidance below can be used for retrofit projects or new interchange designs.

Travel lanes should be reduced from 12 feet to 10 or 11 feet to slow motor vehicle speeds and provide additional space for bicycle lanes and sidewalks

- Class II bike lanes should be striped continuously across overpasses and underpasses wherever feasible
- Minimize distances in which bicyclists are required to travel between two moving traffic lanes
- Use skip stripes to delineate bicycle path travel through conflict zones
- Consider colored bike lanes in conflict areas
- Avoid High-speed, Uncontrolled Movements. A tight diamond configuration with square off and on-ramps to encourage slower motor vehicle speeds and is recommended
- Avoid Multiple Right-turn lanes on Cross-street. Dedicate right turn lanes create a conflict for cyclists traveling through an intersection that must cross the right turn lane to continue to ride straight. Where possible, retain single right-turn lanes, even if greater than 200 feet. Where possible, avoid right-turn lanes greater than 200 feet

Treatments at Bridges and Tunnels

Bicycle connections to bridges and tunnels require special treatment to ensure the safety and comfort for all road users. Fast moving traffic, transitions between the roadway and the structure and wide travel lanes often make approaches to bridges and tunnels difficult areas for bicyclists and pedestrians to navigate. Appropriate measures to improve bicycle safety at bridge and tunnel approaches include:

- Reduce travel lanes from 12 feet to 10 or 11 feet to slow motor vehicle speeds and provide additional space for bicycle lanes and sidewalks
- Stripe Class II bike lanes continuously across bridges and through tunnels wherever feasible
- Minimize distances in which bicyclists are required to travel between two moving traffic lanes
- Use skip stripes to delineate bicycle path travel through conflict zones
- Consider colored bike lanes in conflict areas

Bike Loop Detectors and Push Buttons



As new signals are installed or major updates occur to existing signalized locations, bicycle loop detectors should be installed on the bikeway system at the stop bar for all actuated movements of the signal. It is suggested that loop detectors be installed in the approach bike lane 100 feet in advance of the intersection as well as at the intersection itself. The upstream loop should not be used when it would be triggered by right-turning vehicles. When the

upstream loop is triggered, the green time should be extended for the cyclist to reach the loop at the stop bar, at which point the signal should allow the cyclist to clear the intersection. The time that a bicycle needs to cross an intersection is longer than the time needed for vehicles, but shorter than the time needed for pedestrians. The AASHTO Guide for the Development of Bicycle Facilities includes detailed equations for bicycle signal timing. In general, while the normal yellow interval is usually adequate for bikes, an adjustment to the minimum green should be considered.



Image: Bicycle pushbutton in Menlo Park, CA

Stencils indicating the loop detector should be marked on the roadway at the intersection where a bicyclist may not be positioned correctly over a loop. Figure B-15 shows the appropriate location and use of loop detector stencils at intersections.

Push buttons are appropriate when other methods of detection are not feasible, particularly at narrow tunnels or where multi-use paths cross signalized intersections. A bicycle push button/pad/bar is similar

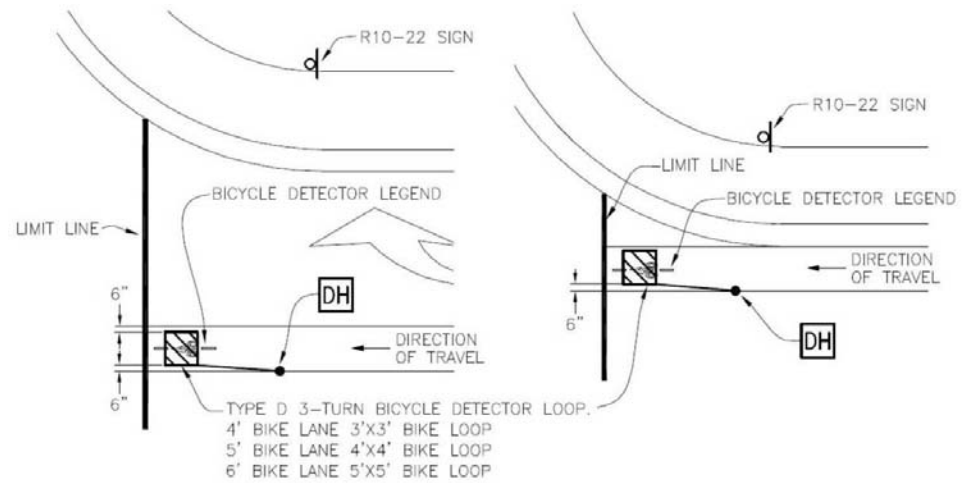
to those used for pedestrians, but installed in a location most convenient for bicycles and actuates a signal timing most appropriate for bicyclists. The sign plate located above the push button/pad/bar indicates that it is for use by bicyclists. The larger the surface of the button, the easier it is for cyclists to use, thus a push pad is preferential to a

push button, and a push bar is preferential to a push pad, as it can be actuated without removing one's hands from the handlebars. Advantages of the push button are that it is typically less expensive than other means of detection, and it allows for different signal timing for different user needs. The disadvantages of the pushbutton are that the location of the pushbutton usually does not allow the cyclist to prepare for through or left-turning movements at the intersection, and that it forces the bicyclist to stop completely in order to actuate the signal.

Caltrans Policy Directive 09-06

Caltrans recently modified its policy on bicycle detection at new and modified approaches to traffic-actuated signals. The California MUTCD was amended to require that in-pavement bike detectors or push buttons be placed on approaches to signalized intersections. If more than 50 percent of limit line vehicle detectors need to be replaced, then an entire intersection should be upgraded so that every lane has limit line detection. The signal timing guidance was also updated to reflect a bike speed of 10 mph (14.7 ft/sec) with 6 seconds of startup time based on current research.

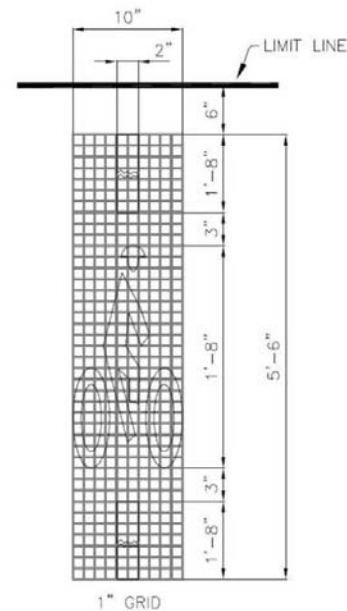
Figure B-15 | Bike Loop Detector



NOTE: CENTER OF BICYCLE DETECTOR LOOP
SHALL BE 3' BACK FROM THE LIMIT LINE.

TYPICAL BICYCLE DETECTOR LOOP AND LEGEND PLACEMENTS

(NO SCALE)



BICYCLE DETECTOR LEGEND

(NO SCALE)



R10-22 SIGN

(NO SCALE)

CLASS III BIKE ROUTES

Class III bike routes are intended to provide continuity throughout a bikeway network and are primarily identified with signage. Bike routes can be used to connect discontinuous segments of a Class I or Class II bikeway. Bike routes are shared facilities either with motorists on roadways or with pedestrians on sidewalks (not desirable).

Minimum widths for bike routes are not presented in the Highway Design Manual, as the acceptable width is dependent on many factors. The following table presents recommended average daily traffic (ADT) and speed thresholds for bike routes.

Table B-3 | Recommended Guidelines for Class III Facilities

Curb Lane Width (in feet)	Average Daily Traffic (ADT)	Travel Speed
12' (arterial); 11' (collector); no minimum on local street	Under 5,000 vehicles	Under 25 mph
14'	5,000 – 20,000	25 – 35 mph
15'	Over 20,000	Over 35 mph

Source: Fehr & Peers

Share the Road Markings

Share the Road Markings, or “sharrows” are a newer design application used in California, and have been tentatively approved for the 2009 update to the CA MUTCD Standards. Sharrows are on-street stencils that reinforce that bicyclists are legitimate road users, and are helpful connectors between Class I or Class II facilities when roadway

widths are too narrow for a bike lane. Sharrows are suitable for streets with posted speeds below 35 mph, preferably with on-street parking.

Another potential application for sharrows is in high-conflict zones. Some cities are experimenting with colored bicycle lanes for this purpose; however, Sharrows are more immediately understood by motorists and cyclists as a bicycle facility. New York is the latest American city to use Sharrows this way, although they have long been used in Paris to raise the visibility of cyclists through complex intersections and to clearly indicate the best path of travel for cyclists.

Guidance for Sharrow Placement

(from Section 9C.07 of the 2009 MUTCD)

If used in a shared lane with on-street parallel parking, Shared Lane Markings should be placed so that the centers of the markings are at least 11 feet from the face of the curb, or from the edge of the pavement where there is no curb.

If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb.

If used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter.

Option: A “BICYCLES MAY USE FULL LANE” sign that may be used in addition to the Shared Lane Marking to inform road users that bicyclists might occupy the travel lane.

Figure B-16 | 2009 MUTCD Shared Roadway Marking Guidance for Installation

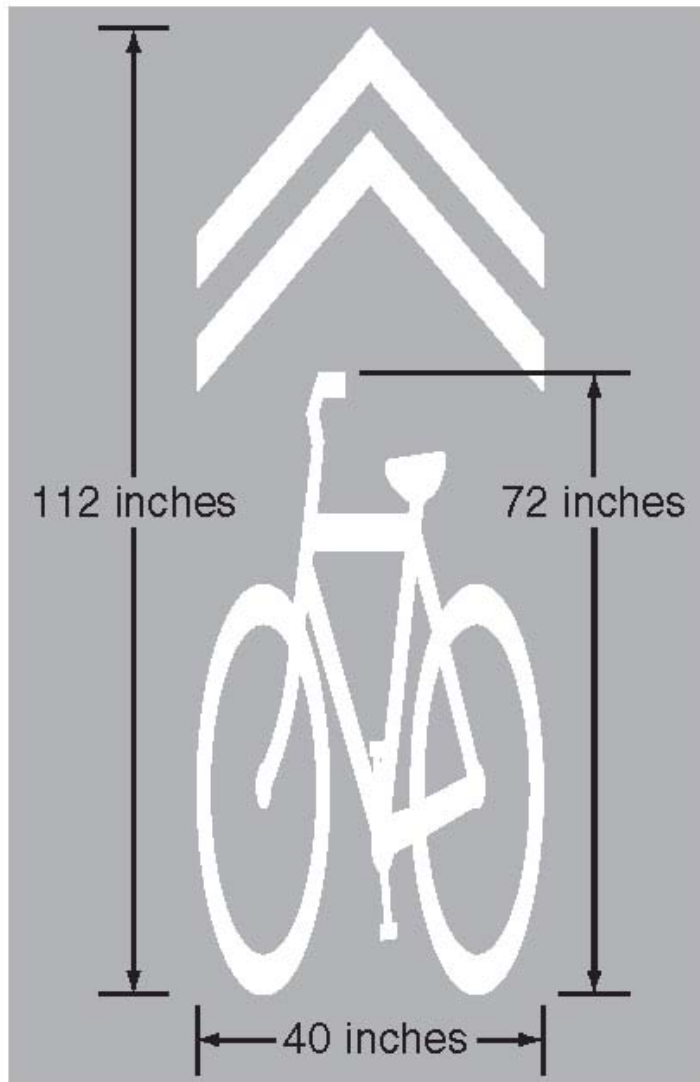


Figure B-17 | Caltrans Shared Roadway Marking Guidance

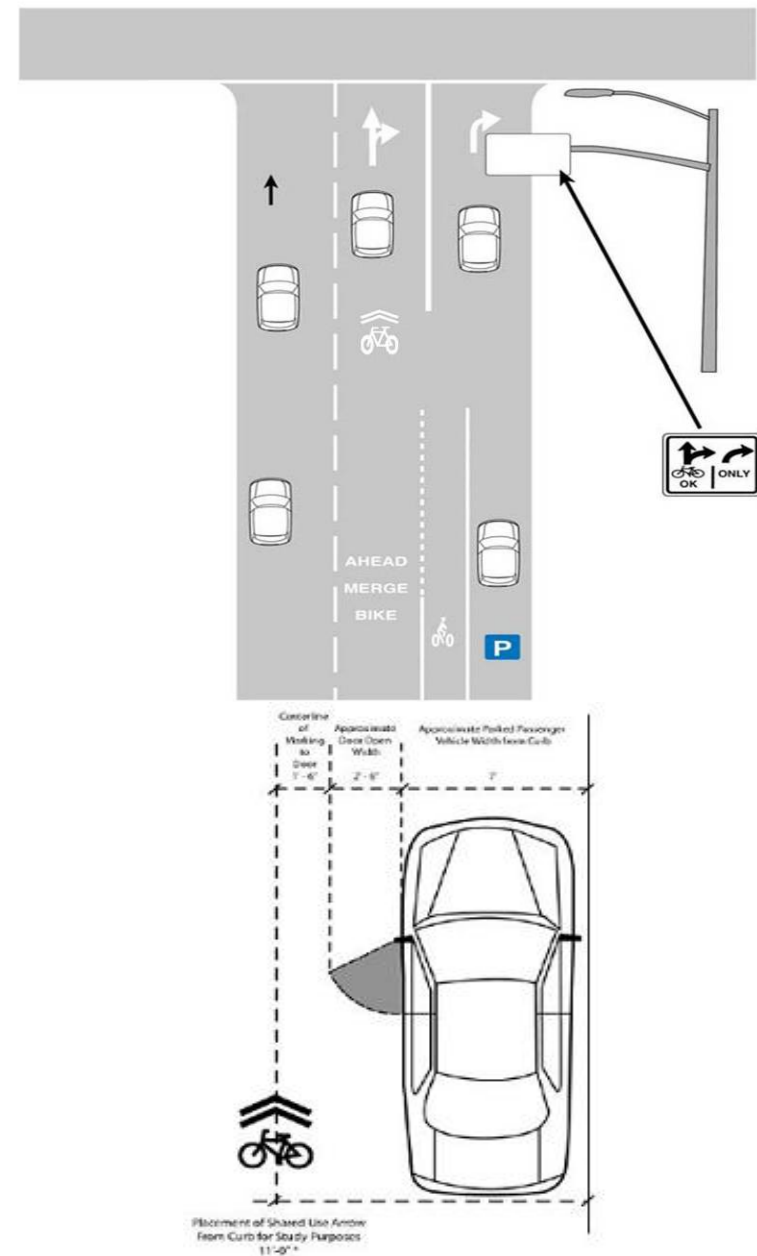
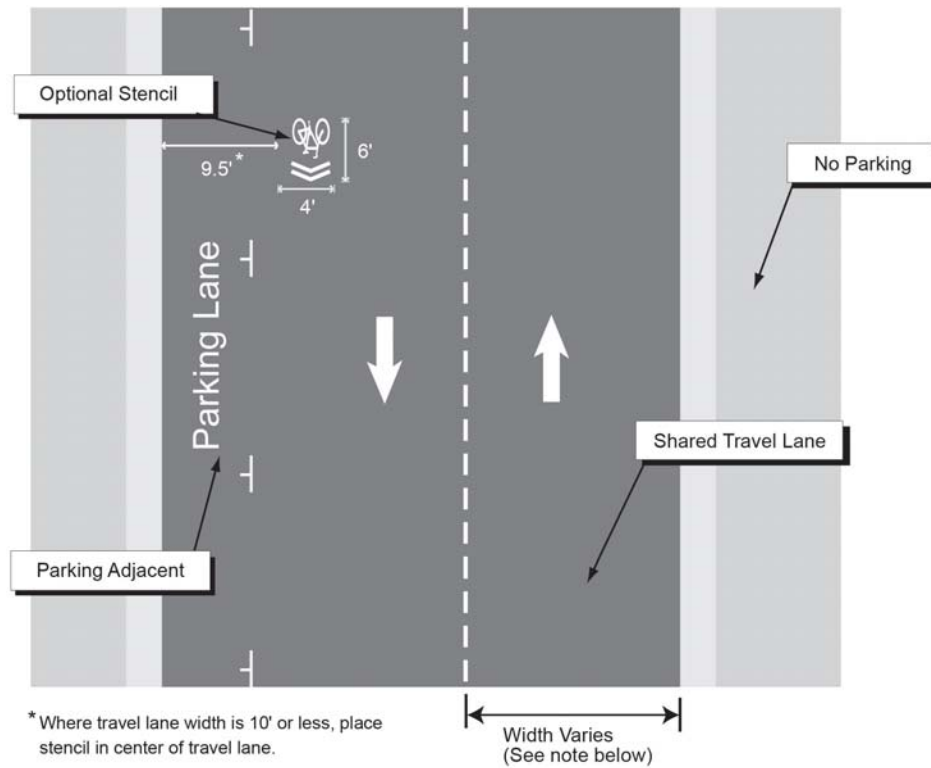


Figure B-18 | Typical Class III Bike Routes



TYPICAL SIGNING



NOTE:

Bike route width varies, 14' is desirable for a shared lane.

Bike Boulevards

An additional type of Class III facility is the Bicycle Boulevard. Typically, bike boulevards are on low-volume streets adjacent to higher volume arterials where bicycles have priority and have a relatively stop-free, low conflict route to their destinations. Traffic calming treatments such as traffic circles, chokers and medians are often used on bicycle boulevards to calm traffic.



Bike Boulevard in Berkeley, California

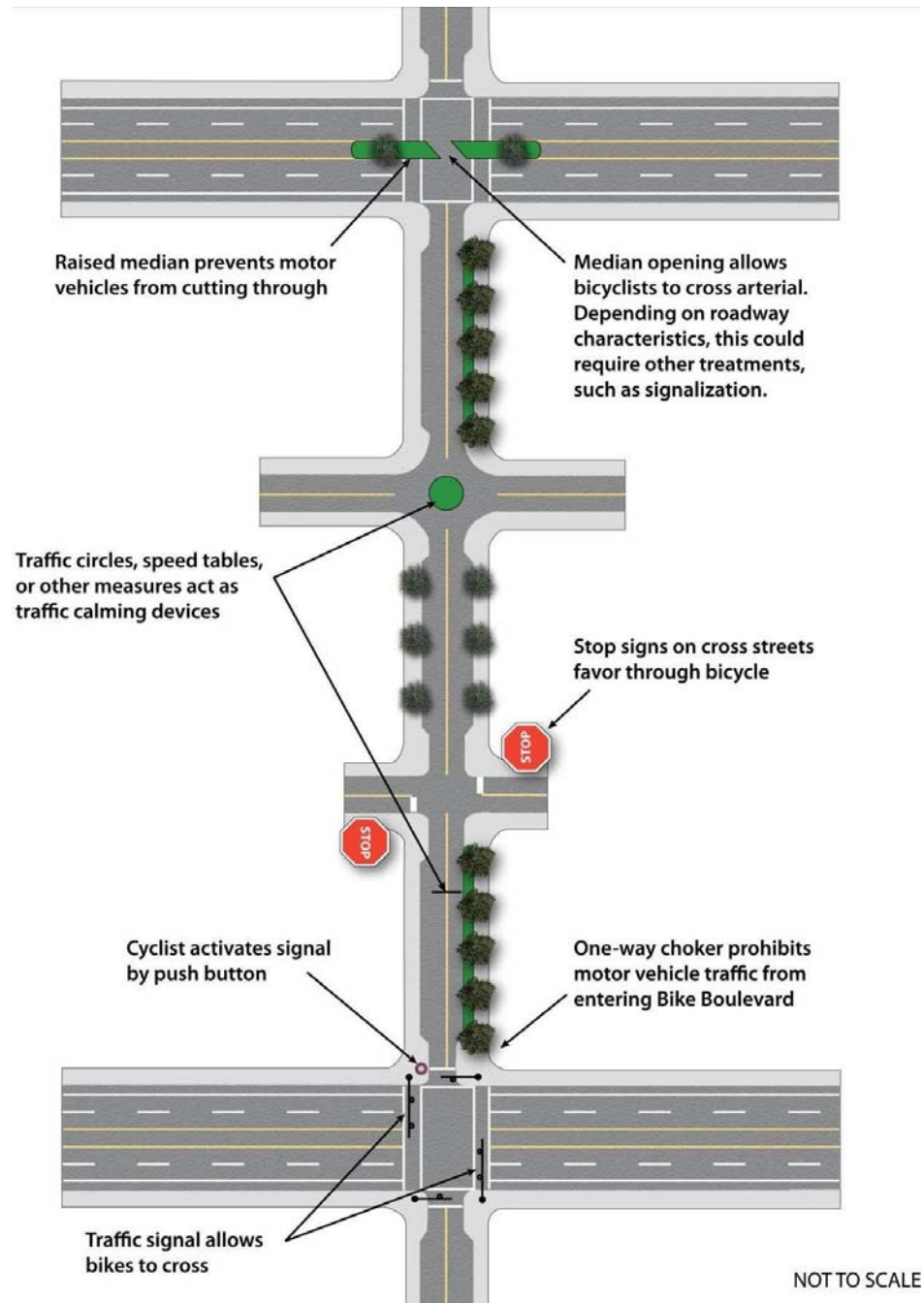
There are six general issues to address during bike boulevard implementation, as shown in the following table. These issues relate to bicycle and pedestrian safety and traffic circulation. There are two categories of tools that can help address these issues. The first category is called Basic Tools. These strategies are appropriate for all bicycle boulevards. The second category is called Site Specific Tools. These are used to varying degrees on a bicycle boulevard to respond to a specific issue, and they require more analysis and stakeholder involvement.

Table B-4 | Considerations and Tools for Bike Boulevards

Issue	Basic Tool	Site Specific Tools
- Create the look and feel of a bicycle boulevard - Slow traffic and discourage diversion of traffic to the bike boulevard when unwarranted STOP signs are removed. Unwarranted STOP signs cause excessive stopping and delay for cyclists. They also increase noise and air pollution, increase fuel consumption, and non compliance compromises safety for all. They often increase speeds mid-block as well. - Address school or pedestrian safety issues - Help bicyclists cross major streets - Reduce motor vehicle traffic speeds - Prevent diversion of motor vehicle traffic onto adjacent neighborhood streets	- Signage - Unique pavement stencils - Pavement legends - Landscaping and street trees	- Traffic circles - Curb extensions - Traffic signals - High-visibility crosswalks

Source: Berkeley Bicycle Boulevard Tools and Design Guidelines

Figure B-19 | Bike Boulevards



SUPER SHARROW LANES

On some collector or arterial streets a bike lane may be the preferred facility, but may not be feasible due to constrained roadway width or high vehicle volumes. Such streets are often designated as bike routes instead, but do not necessarily provide a sufficient level of comfort for everyone because bicyclists must ride between traffic with high speeds and volumes and on-street parking.

To address this issue, the City of Long Beach, California, received permission from the Federal Highway Administration to experiment with “Super Sharrow Lanes” along a key commercial district. The lanes have a typical Sharrow treatment with a six-foot strip of green paint down the center of the outer travel lanes to further indicate the appropriate position for bicyclists using the roadway, and to emphasize the expected location for bicyclists to general traffic.



Image: A Super Sharrow Lane on Second Street, Long Beach CA

Source: Dan Burden and Paul Zykovsky

Installation of Super Sharrow Lanes should be evaluated through an initial pilot phase, and in close coordination with AC Transit and other local transit providers to ensure that bus operations and safety are not affected. Macdonald and San Pablo Avenue may be good candidates for this experimental treatment.

BICYCLE PARKING

Every bicycle trip has two main components: the route selected by the bicyclist and the “end-of-trip” facilities at the destinations, such as safe and secure bicycle parking. This section provides guidance on the provision and placement of bicycle parking facilities.

As the Richmond bicycle network grows, so will the population that chooses to ride a bike. The availability of secure and convenient parking is as critical to bicyclists as it is for motorists. The availability of short and long-term bicycle parking at key destinations such as parks, schools, community facilities, transit stations, shopping areas and downtown is a vital part of a complete bicycle network.

Parking should be highly visible, accessible and easy to use. Facilities should be located in well-lit areas and covered where possible. Installation is equally important; for example a rack that is too close to a wall or other obstruction will not be effectively utilized. See the figures on the following pages for design specifications.

There are different types of parking facilities just as there are different levels of bikeway facilities. Parking facilities fall into one of three main categories:

In-Street / Sidewalk Parking		
• Inverted U-Rack • In-Street Bicycle Corral • Covered Bicycle Parking Facilities • Surface Parking Lot Conversion	Appropriate in areas with pedestrian activity and commercial areas. In-street facilities are ideal for areas with constrained sidewalk space.	Ideal for short-term parking needs (2-3 hours)

Lockers

• Key Lockers • Electronic Lockers	Appropriate for areas with low street activity or isolated areas.	Provides a high level of security, useful for long-term parking needs (>3 hours)
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Enclosed Facilities

• Bicycle Cage • Bicycle Room • Bicycle Station	Ideal for major transit hubs and areas with high bike volumes. Enclosed facilities can also be located in residential, commercial or employment centers with indoor space.	Provides the highest level of security, particularly when parking is attended. Ideal for long-term and over-night parking needs.
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In-Street/Sidewalk Parking

This section describes several types of typical in-street and sidewalk parking techniques.

Inverted U-Racks

Bicycle Racks are low-cost devices that provide a location to secure a bicycle. Ideally, bicyclists can lock both their frame and wheels. The bicycle rack should be in a highly visible location secured to the ground, preferably within 50 feet of a main entrance to a building or facility. Whenever possible, the racks should be visible from the doorways and/or windows of buildings, and not in an out of the way location, such as an alley. Short-term bicycle parking is commonly used for short trips, when cyclists are planning to leave their bicycles for a few hours.

The most common mistake in installing bike racks is placing them too close to a wall or fence, or orienting them the wrong way, rendering the rack unusable; nor should they impede pedestrians. In addition, in order to accommodate a range of bicycle styles and sizes, racks must be installed to allow sufficient space between bicycles and between racks.

Bicycle Rack Materials & Coatings

There are a variety of materials and coatings available for steel bicycle racks. Individual choices may vary depending on the available budget and aesthetic preferences, but the main options include the following:

Stainless Steel is the recommended choice because it is attractive and relatively maintenance free, but it is also typically the most expensive.

Galvanized Coatings are durable and much cheaper than stainless steel, but galvanized racks are not typically considered as attractive as other options. The low price and easy maintenance makes galvanized racks one of the mostly popular options.

Vinyl Coating is a good option when aesthetics and durability are considered. Vinyl requires minimal maintenance. More importantly, vinyl coatings are the most user-friendly of all the options because they will not scratch bicycles the way harder coatings will.

Powder Coating provides the best color coating option and is highly durable. It is more resistant to wear than regular paint and can easily be touched up if needed. Powder coating is usually the same cost as galvanized.

Paint is not as durable as some of the other options. This is a major issue in an area like Alameda where metal surfaces are subjected to alternating cycles of large amounts of rain in the winter months and searing heat in the summer. Paint chips, wears off quickly and requires regular repainting and maintenance to keep a reasonable appearance.

If there is space for two or more bikes on a single rack, there must be a minimum of 30 inches center to center between bicycle tires when bicycles are locked side to side; otherwise, the handlebars of one bicycle can prevent another bicycle from parking in the adjacent space.

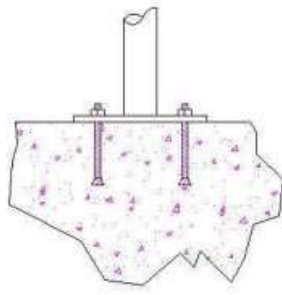


Image: Covered bike racks protect bicycles from rain and other elements.

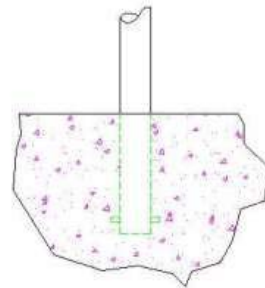
In addition to optimizing space by situating adjacent bicycles a sufficient distance apart, bicycle racks must be installed to allow sufficient space for bicyclists and their bicycles to move about between racks. In most cases, a standard bicycle footprint is six feet long. Aisles between rows of racks must be a minimum of four feet wide.

Other Considerations

- There are two primary types of rack installation: surface mount and cast-in place. Surface mount is preferred, however racks are designed for only one or the other installation type. In all cases, racks should be installed in concrete, never in soil and rarely in asphalt. There are issues to consider with each type of installation, detailed below:
- **Surface mount:** for installation after the substrate is in place (e.g. concrete slabs). For many rack types, this is the only option, but care should be taken in choosing the installation hardware. A technique among bicycle thieves is to steal a whole rack and load it into a truck, so only anti-tampering bolts and other hardware should be used. Surface mounted bicycle racks should only be mounted in concrete – asphalt will not securely hold the mounting hardware. If an asphalt substrate is all that is available, concrete footings should be poured. Multiple loop racks on flanges may be installed in asphalt, which can be useful for in-street bike corrals. For a more secure rack installation, perpendicular bars could be installed under the surface to prevent the rack from being pulled directly from the concrete. See illustration, below.



Surface mount bicycle rack installation



Embedded bicycle rack installation, also known as "cast-in-place" (courtesy of Creative Metalworks)

Embedded or cast-in-place: consider whether the location where the rack needs to be installed may already have a slab poured, or the chosen rack type may not provide a cast-in-place option. Also, embedded racks are expensive to relocate in the future if needed. Cast-in-place installation is appropriate for asphalt or concrete. See illustration, left.

- **Bicycle Spacing:** The basic footprint of bicycle parking design, whether parked horizontal or vertical, is 6 feet long, 2 feet wide, and 4 feet high. There are also spatial parameters to consider, and some rack makers do not allow enough space between the racks to allow for handlebar widths. The following specifications for inverted U-racks provide guidance on the minimum space needed. Where possible, provide additional spacing.

Poor rack design



This design is too low and poses a tripping hazard, and its small parts may scratch bikes. (Source: Sacramento Area Bicycle Advocates)

"Wheel bender" bicycle rack



When full, bicycles in the middle only have one source of support. (Source: Sacramento Area Bicycle Advocates)

- **Spacing between Bicycles:** If there are two or more rack spaces joined together, there must be a minimum of 30 inches center-to-center between bicycle tires when bicycles are locked side to side, and more if space is available. Otherwise, handlebars can get tangled up – a situation that is especially critical when dealing with large volumes of bicycles with relatively high turn-over of parking.
- **Spacing between Racks:** Aside from the physical space requirements between bicycles on the racks, space must be made for bicycles to move about between racks. If an aisle must be made between bicycle racks, a minimum of two feet wide and six feet long with a three foot aisle must be set aside to allow room for bicycles to move in and out of the racks. Spacing between racks or between a rack and other fixed objects can still be an issue. For most types of bicycles, six feet is considered a standard footprint. The graphics on the right show typical dimensions and placement requirements for bicycle parking racks. This type of rack can be installed in multiples to provide additional bicycle parking.



An old bike rack at Richmond City Hall demonstrates the need for proper bike rack design

Figure B-20 | Recommended Bike Rack Spacing (Association of Pedestrian and Bicycle Professionals)

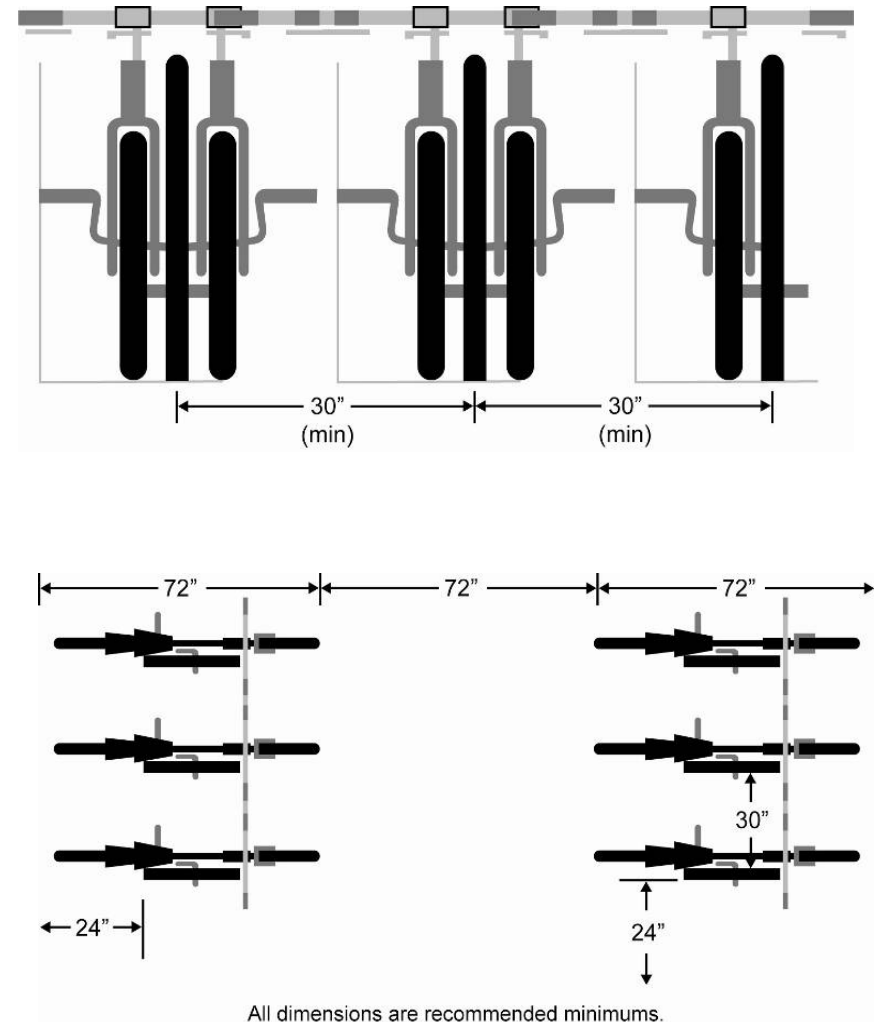
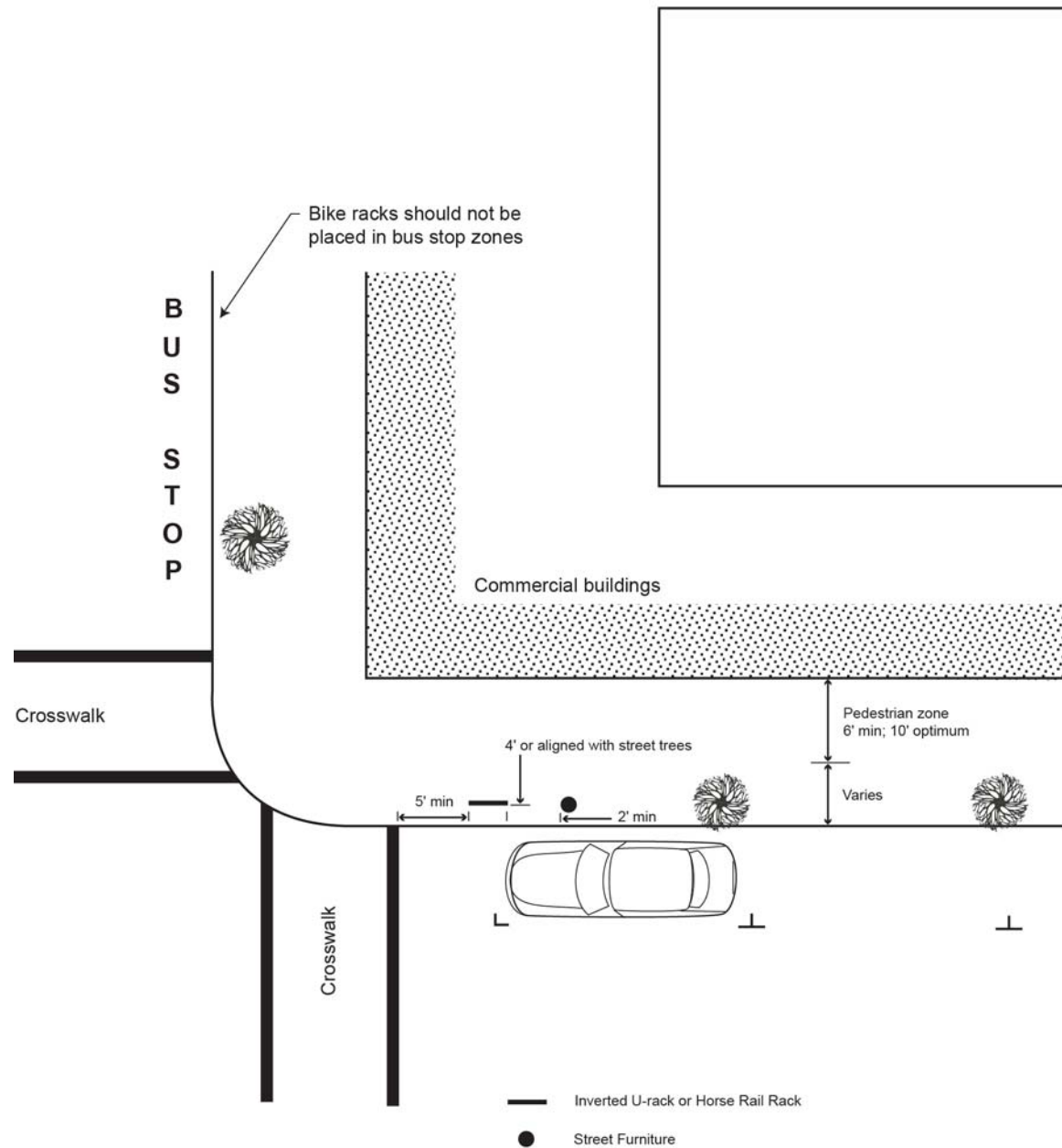


Figure B-21 | Bike Parking on Sidewalks



In-Street Bicycle Corral



This option is ideal for locations with a high parking demand and insufficient sidewalk space. Bike corrals have been used in Portland, San Francisco and Berkeley and involve replacement of parking spaces

with inverted U-racks. Bollard installation is recommended to protect cyclists and bicycles from adjacent vehicles. Two vehicle parking spaces can accommodate a corral with 10-12 racks for 20-24 bikes. Costs vary depending on the choice of materials, but can range from \$3,000 for a multiple loop rack and flexible bollards, to \$45,000 for a poured concrete pad, stainless steel bollards and custom racks. Corrals are a relatively low-cost option that reduce sidewalk clutter and do not obstruct the public right-of-way. Corrals can be placed in red zones, but frequently vehicle parking may be removed. If parking is a priority in a given area, local jurisdictions should decide whether bike corrals are appropriate.

Candidate locations for in-street bike corrals include:

- Pt. Richmond, adjacent to Starbucks
- Catahoula Coffee and Williams Health Foods on San Pablo Avenue
- Adjacent to the Mira Vista Post Office
- Nichol Park adjacent to the skate park

Covered Facilities



Covered bicycle racks, also referred to as a “bicycle oasis” provide shelter from weather conditions, constant rain in the winter takes its toll on bicycles causing a bike’s metal frames to rust, but constant sunlight all summer can be worse with ultraviolet rays deteriorating seats and tires. Covered bicycle parking has also been proven to increase cyclists’ willingness to park their bicycles for longer periods of time. In order to provide secure coverage from rainfall

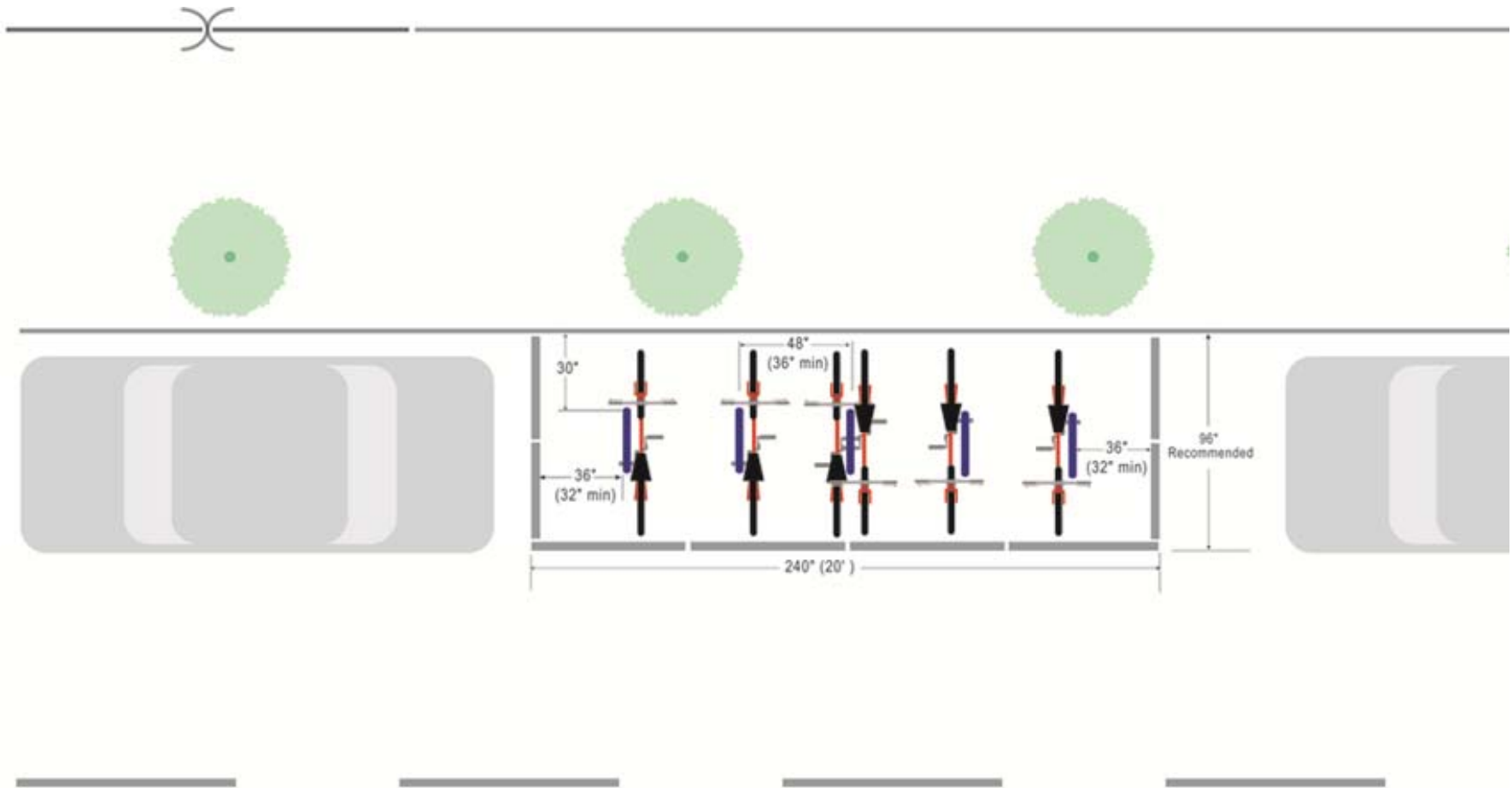
and clearance for cyclists, the cover should be at least seven feet above the ground. Existing covers such as overhangs or awnings are a low cost way of incorporating covered parking.

New York City and Portland have begun to implement covered bicycle parking. These designs provide shelter, map and advertisement capabilities (see photo, right). Covered racks do not necessarily deter theft any more than uncovered racks, and partial cover or cover that is too high does not protect against weather conditions and thus defeats the purpose.

Surface Parking Lot Conversion

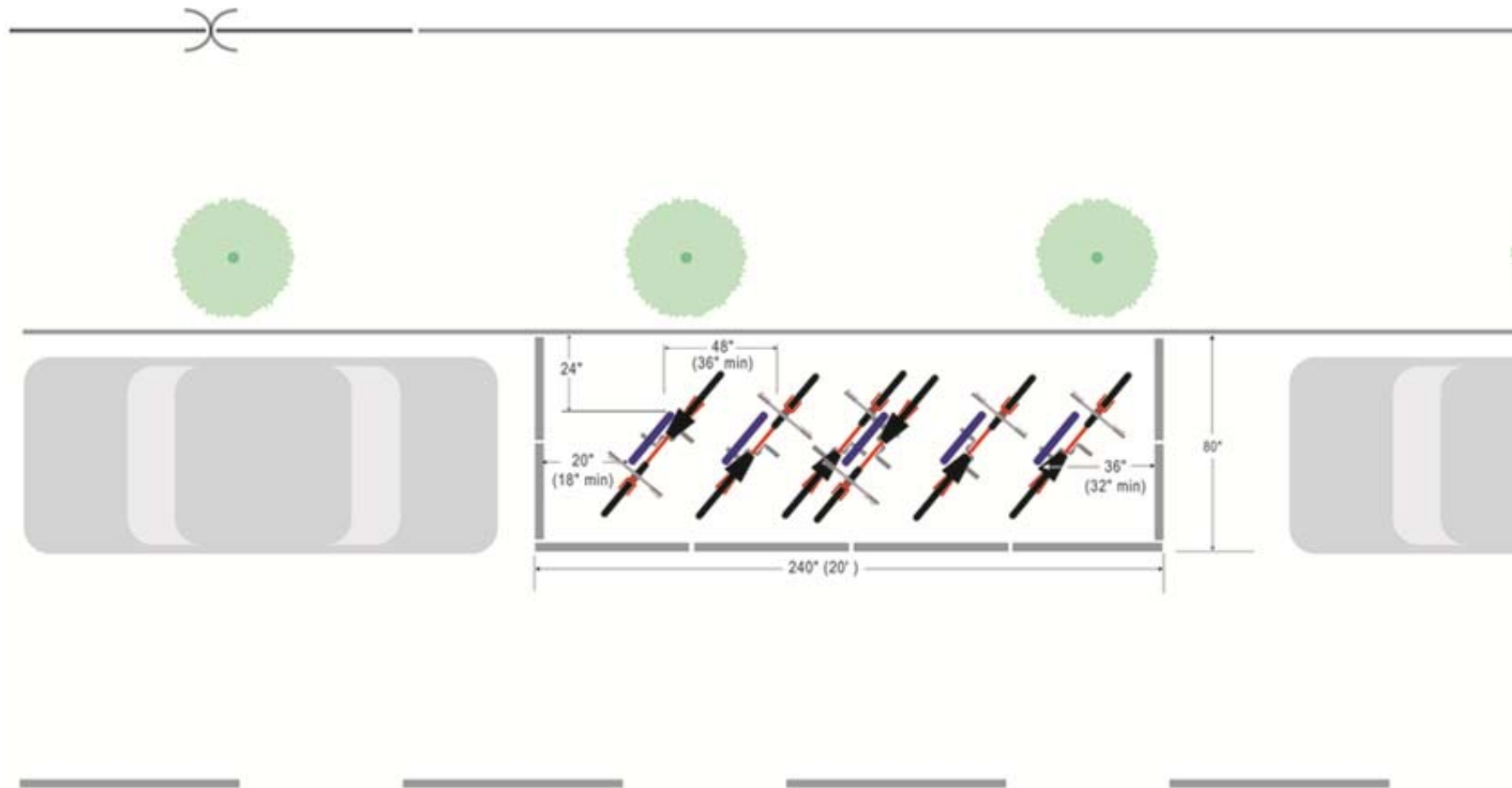
Parking lots near key destinations are ideal places for converting a few parking spaces into short term or long-term bicycle parking. Six racks can fit into the space occupied by one car. Adding U-racks with bollards and a covered or fenced area designates bicycle parking from vehicle parking. Bike cages can also be used in parking lots and provide security access through electric pass key systems. Simpler, less expensive modifications of surface lot parking spaces, such as a bike corral may be considered.

Figure B-22 | Bicycle Parking Layout for an In-street Parking Space (Perpendicular)



(Image source: The Association of Pedestrian and Bicycle Professionals)

Figure B-23 | Bicycle Parking Lay-out for an In-street Parking Space (Diagonal)



(image source: The Association of Pedestrian and Bicycle Professionals)

Bicycle Lockers

Bicycle Lockers are covered storage units that can be locked individually, providing secure parking for one bicycle. Bicycle cages are secure areas with limited-access doors. Occasionally, they are attended. Each of these means is designed to provide bicyclists with a high level of security so that they feel comfortable leaving their bicycles for long periods of time. They are appropriate for employees of large buildings and at transit stations. Lockers provide a secure place for bicyclists to store their helmets or other riding gear. Showers are important for bicycle commuters with a rigorous commute and/or formal office attire.

Bicycle Locker Materials

Stainless Steel is the best material because it is the strongest and most durable, it reflects sunlight well, and requires the least amount of maintenance because stainless steel never needs painting. Increasingly, perforated panels are being used for security purposes to make the contents of the locker visible. Perforated panels reduce the weather protection of the locker, and the top of the locker should always be solid. Also, consider placing perforated lockers in areas less exposed to the elements.

Powder Coated Steel is the second best option. Although not as durable as stainless steel, powder coat will last many years and gives the purchaser a broad range of color options (note: dark colors should be avoided due to heat absorption in the summer.)

Composite Materials such as resin based materials, chip-board, and particle board should be avoided. These materials photo-oxidize and break down quickly, and are easier to break into than steel lockers. However, lockers made of non-metallic sheet molding composites, such as the Cycle-Safe brand, are achieving new levels of quality, performance and cost-effectiveness.

Electronic Lockers



19th Street & Broadway Downtown Oakland BART
(Photo by Jason Patton, City of Oakland)

Electronic bike lockers provide secure individualized parking that can be accessed with an electronic card. Unlike standard key lockers, which provide one key for one renter, a single e-locker can be rented by multiple cyclists each week

by using smart card technology. The improved efficiency translates into greater availability, and is a popular option at transit stations throughout the Bay Area.

Bicycle lockers come in a variety of shapes and sizes depending on the need and the amount of space available. The most common bicycle locker size is approximately 40" wide by 48" high by 72" long. These typically have a diagonal divider inside the locker so that they will accommodate two bikes. Lockers with diagonal dividers are designed to open from two sides, so there should be adequate room on both sides of the locker to comfortably open the door and slide the bicycle in and out, which equates to six feet of clearance from both doors (see graphic below.)

Wedge-shaped locker units accommodate one bicycle, and are a useful design for corner areas. They can also be placed against walls in areas with a constrained public right-of-way.

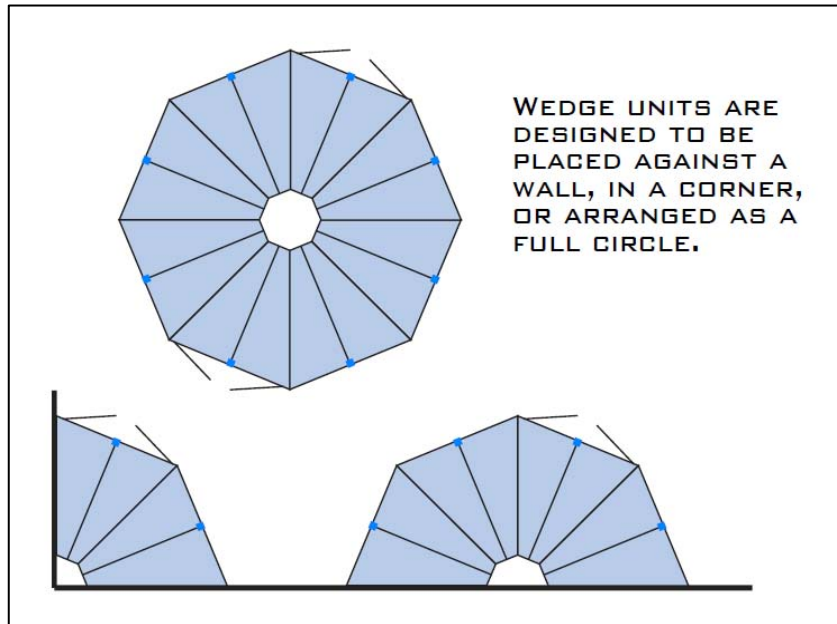
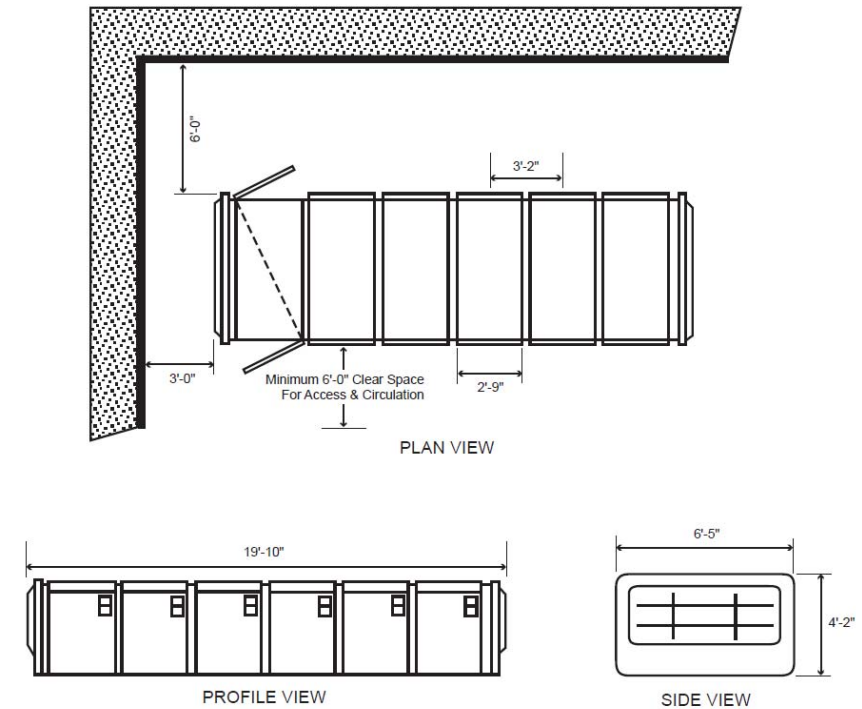


Image courtesy of BikeLink eLock-

Figure B-24 | Bike Locker Placement Guidance



Enclosed Facilities

This section describes several types of typical off-street and enclosed parking facilities.

Bicycle Cage

Bike cages are shared access storage areas in which cyclists lock their own bikes. Bike cages are often used by transit centers and large employers or universities to provide an extra layer of security for long-

term bike parking. Cages are a popular option for bike commuters because they provide a high degree of security and they protect bikes. Bike cages can be accessed by registered users at any time, and with unlimited ins and outs.



High security bike cages
Photo sources: J. Luton & J. Stanley

cages have used conventional lock-and-key systems, but these have proved cumbersome from an administrative standpoint. Magnetic pass keys also allow parking managers to monitor who goes in and out of the bike cages. Local jurisdictions or local non-profit organizations are typically responsible for implementing and maintaining this type of facility.

While cages provide additional security over U-racks or other on-street parking facilities, many people may have access to the facility. Small cages are preferred to limit the number of people with access to any single cage. Security may be bolstered by surveillance cameras and monitoring. A single cage of 18' by 20' occupies the same footprint as two standard parking stalls (or 9' by 20' each.)

Cyclists gain access to the bike cage by signing up in advance for a key or a key code. Historically, bike

Bicycle Rooms

Bike rooms provide enclosed and sheltered parking and protection from theft. A bike room is an excellent option for a transit terminal, but any available building floor space can be converted into a bike room. Bike rooms may have wall racks or floor racks, and should allow easy access by elevator or ramp to the ground level. Adding self-serve features such as bike pumps, bike stand and basic tools creates extra amenities to cyclists. They also require little maintenance and an attendant is not needed because users are provided with an access code to enter facility.

Bike rooms are ideal in business parks or apartment or condominium complexes. Individual businesses or apartment complexes would be responsible for providing bike room facilities.

Bicycle Station

The ultimate safety and security option for bike commuters and their bikes is the bike station, which combines all the safety features of good racks, the security of a bike cage, and attended parking; typically only the staff person may check bikes in and out. Users may or may not have to pre-register. In addition to high security bike parking, most bike stations also sell basic bike accessories, some sell bikes, and the majority provide basic bike repair while the cyclist is at work. These extra repair and retail services generate revenue to offset staffing costs and provide additional services for users. All of these options provide further incentives for cyclists to leave their bikes at the station. However, the hours of operation can be limited by funding constraints. Cyclists who want to retrieve their parked bike after hours can only do so by prior arrangement with the staff operator. There is usually no charge for regular day or overnight parking in the first few years of operation, since there are usually grant subsidies for operations. Bike

stations would be appropriate at major transit hubs such as a ferry terminal.



Bicycle Station at 4th & King Caltrain Station, San Francisco
Photo Source: Jim Dyer

Bicycle stations have high capital and operating costs and may not be feasible unless co-located with other attractors such as major transit hubs, high-density housing and retail. A short- to medium-range improvement for bicycle parking would be an unstaffed high capacity bicycle cage(s). The Richmond Intermodal Transit Village would be an ideal location for a bicycle station.

BICYCLE SIGNAGE

Several new bicycle guide signs, along with information on their use, will be added to the 2009 CA MUTCD guidelines. These signs provide flexibility and may reduce costs for signing bicycle routes in urban areas where multiple routes intersect or overlap.

Wayfinding and Destination Signage



Among these signs are a new Alternative Bike Route guide sign and new Bicycle Destination signs, which indicate direction, distance in miles and destinations along bicycle routes.

In July 2009, the City of Oakland adopted a new system for bicycle wayfinding signage² based on these new MUTCD sign standards, with the addition of the City of Oakland logo (see image, right). The City of Richmond should consider adopting a similar system, and should consider a logo or City seal that reflects local qualities.

The green sign system includes three sign types:

- **Confirmation Signs:** Confirm that a cyclist is on a designated bikeway. Confirmation signs are located mid-block or on the far side of intersections, and include destinations and distances
- **Turn Signs:** Indicate where a bikeway turns from one street on to another street. Turn signs are located on the near side of intersections, and include directional arrows.

² The City of Oakland's Design Guidelines for Bicycle Wayfinding Signage can be found at <http://www.oaklandpw.com/AssetFactory.aspx?did=3528>

- **Decision Signs:** Mark the junction of two or more bikeways. Decision signs are located on the near-side of intersections, and include destinations and directional arrows.

Destination symbols, such as to the Richmond BART Station, shoreline access, bridge approaches and community destinations may be used. The figure on the next page illustrates these sign types.

Signs for Shared Roadways



Share the Road Signage: A “Share the Road” sign assembly (W11-1 + W16-1P) is intended to alert motorists that bicyclists may be encountered and that they should be mindful and respectful of them. However, the sign is not a substitute for appropriate geometric design measures that are needed to accommodate bicyclists. The sign should not be used to address reported operational issues, as the addition of this warning sign will not significantly improve

bicycling conditions. The sign may be useful under certain limited conditions, such as at the end of a bike lane, or where a shared use path ends and bicyclists must share a lane with traffic. The sign may also be useful during construction operations, when bicyclists may need to share a narrower space than usual on a travelway. This sign should not be used to indicate a bike route. A fluorescent yellow-green background can be used for this sign.

Another sign that may be used in shared lane conditions is the BICYCLES MAY USE FULL LANE sign (R4-31 11). This sign may be used on roadways without bike lanes or usable shoulders where travel lanes are too narrow for cyclists and motorists to operate side by side within a lane.



Wrong Way Riding: Where wrong-way riding by cyclists is a frequent problem, the MUTCD provides a bicycle WRONG WAY sign and RIDE WITH TRAFFIC plaque (R5-1b and R9-3cP) that can be mounted back-to-back with other roadway signs (such as parking signs) to reduce sign clutter and minimize visibility to other traffic. This sign assembly can be used in shared lane situations, as well as on streets with bike lanes and paved shoulders.

Figure B-25 | Bicycle Sign Types for the City of Oakland

(source: City of Oakland Design Guidelines for Bicycle Wayfinding Signage, July, 2009)



MAINTENANCE STANDARDS

Since most cycling occurs on public roads, roadway maintenance is an important part of accommodating cycling. Below are some types of targeted maintenance.³

Surface Repairs: Inspect bikeways and road shoulders regularly for surface irregularities, such as potholes, pavement gaps or ridges. Such hazards should be repaired quickly.

Sweeping: Prioritize bike routes when establishing a street sweeping schedule. Sweeping road shoulders of accumulated sand and gravel in the springtime, and fallen leaves in the autumn where they accumulate. Sweepings should be picked up rather than just pushed aside in areas with curbs. Driveway approaches may be paved to reduce loose gravel on paved roadway shoulders. Off-street bike facilities should have an established maintenance schedule that includes routine sweeping.

Pavement Overlays: Where new pavement is installed, extend the overlay to the edge of the roadway. If this is not possible, ensure that no ridge remains at the edge of the road shoulder or bike lane. Do not leave a ridge within the bike travel area. Drain grates should be within 6 millimeters of the pavement height to create a smooth travel surface. Special attention should be given to ensure that utility covers and other road hardware are flush with new pavement.

³ Todd Litman, Robin Blair, Bill Demopoulos, Nils Eddy, Anne Fritzel, Danelle Laidlaw, Heath Maddox, and Katherine Forster. *Pedestrian and Bicycle Planning: A Guide to Best Practices*. Victoria Transport Policy Institute (2010)

Rail Crossings: Rail crossings can be hazardous to cyclists, particularly if they are at an oblique angle. Warning signs and extra space at the road shoulder can allow cyclists to cross at a 90° angle. A special smooth concrete apron or rubber flange may be justified at some crossings.

Vegetation: Vegetation may impede sight lines, or roots may break up the travel surface. Vegetation should be cut back to ensure adequate sight lines, and invasive tree roots may be cut back to preserve the travel surface.

Street Markings: Bike lane markings signal loop indicators may become hard to see over time. These should be inspected regularly and retraced when necessary.

Markings: Whenever roadway markings are used, traction or non-skid paint should be used to avoid the markings becoming slippery in wet weather.

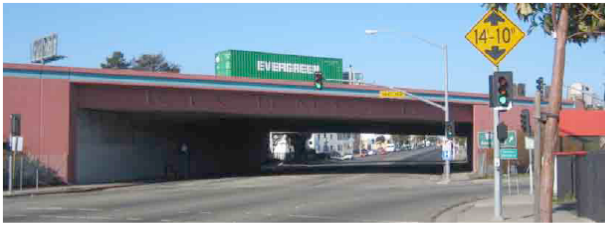
Utility Covers and Construction Plates

Utility covers and construction plates present obstacles to bicyclists due to their slipperiness and change in surface elevation with the surrounding pavement. While covers and plates can be replaced with less slippery designs, as discussed below, to minimize their adverse impacts on bicyclists, it is best to design the roadway so that they are not located within the typical path of bicyclists riding on the roadway. Therefore, new construction should endeavor not place manhole and other utility plates and covers where bicyclists typically ride (i.e. within the six feet adjacent to the curb, or between 7 and 12.5 feet from curb if parking is permitted). These guidelines require a minimum of 2.5 feet straight and clear.

Wet utility covers and construction plate materials can be slippery. Plain steel plates are slippery and should not be used for permanent installation on the roadway. Temporary installations of construction plates on the roadway should endeavor to avoid using plain steel plates if possible. The placement of construction plates should consider bicycles and if possible, be located to provide a clear zone for cyclists to avoid the plates. An example of an effective method for covers and plates (both steel and concrete) to have acceptable skid resistance is for the manufacturer to imprint waffle shaped patterns or right-angle undulations on the surface. The maximum vertical deviation within the pattern should be 0.25 inch (6 mm).⁴

⁴ Santa Clara Valley Transportation Authority Bicycle Technical Guidelines

C . Proposed Underpass Improvements

Overpass:	Lighting:	Pedestrian Railings:	Sidewalk Condition:	Walls/Abutments:	Plantings:	Bridge Facings:
 San Pablo Avenue North of Barrett	24/7 Illumination should be installed above sidewalks	Install pedestrian railings on both sides of the street	Sidewalks should be widened by narrowing width of San Pablo Ave.	East side has mural by J. Wurle. West side must have similar mural	Abutments are currently planted.	"Richmond" is painted on each facing (should be maintained)
 Barrett Avenue	24/7 Illumination should be installed above sidewalks on both sides of the street	Install pedestrian railings on both sides of the street	Sidewalks should be widened by installing pavers in existing area intended for planting	Overpass rests on dirt embankments that should be covered with decorative pavers.	Areas exposed to sunlight have been planted with 'rock roses' and other plants. Palms or Redwoods should be added to create 'gateways'	Street name should be painted on facings
 Macdonald Avenue	Lighting was recently installed on south wall. Must also be installed on the north wall	Bollards were installed on the south wall. Bollards or railings should be installed along the sidewalk on the south side of the street.	Sidewalk on north side of the street must be widened. Street embedded lights should be installed in the cross walk where northbound traffic exits I-80.	The south wall has an intact mural by John Wurhlie. A similar mural should be painted on the north wall	A Coastal Redwood grove should be planted in the center of the exit circle. Redwoods should be planted on the east side of the overpass.	Street name should be painted on Facings. A second option would be to encourage vines to grow across the face of the overpass.

Overpass:	Lighting:	Pedestrian Railings:	Sidewalk Condition:	Walls/Abutments:	Plantings:	Bridge Facings:
 Cutting Boulevard	24/7 Illumination needed above sidewalks	Install pedestrian railings on both sides of the street. Add safety devices because of commute lane exit	Sidewalks should be widened. Additional pedestrian safety devices should be installed because of commute lane exit.	The overpass rests on dirt embankments that should be covered with decorative pavers	Some planting is already in place	Street name or district should be painted on the bridge facings
 Potrero Avenue	24/7 Illumination should be installed above sidewalks	railings should be installed on each sidewalk to separate pedestrian and motor vehicles	Sidewalks should be widened using decorative pavers	The overpass rests on dirt embankments that should be covered with decorative pavers	Some planting is already in place. Redwoods or Palms should be planted to create gateway	Street name or district should be painted on the bridge facings
 Carlson Boulevard	24/7 Illumination should be installed above sidewalks	Install pedestrian railings on both sides of the street	Widen sidewalks by narrowing street by 18" to 24" on each side.	Install <u>ceramic tile</u> murals on each concrete abutment	Some planting is <u>already in place</u> .	"Richmond Annex" has been painted on the facings of the bridge. This should be maintained

Overpass:	Lighting:	Pedestrian Railings:	Sidewalk Condition:	Walls/Abutments:	Plantings:	Bridge Facings:
 Central Avenue	24/7 Illumination should be installed above sidewalks	Pedestrian railing have been installed	Fill any available area with decorative pavers	The overpass rests on dirt embankments that should be covered with decorative pavers	Upgrade current planted areas	Street name or district should be painted on the bridge facings
 2nd Street @ I-580	24/7 Illumination should be installed above sidewalks	Install pedestrian railings on both sides of the street	Fill any available area with decorative pavers	The overpass rests on dirt embankments that should be covered with decorative pavers	Areas should be planted with Redwoods	Street name or district should be painted on the bridge facings
 I-580@ Canal	24/7 Illumination should be installed above sidewalks	Install pedestrian railings on both sides of the street	Fill any available area with decorative pavers	Install <u>ceramic tile</u> murals on each concrete abutment	Upgrade current planted areas	Encourage continued growth of vines that are beginning to cover facings

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