



To: Bay Trail Board of Directors
From: Laura Thompson
Date: March 30, 2016
Subject: Spring 2016 Bay Trail Board Meeting

We are pleased to welcome you to the spring 2016 Bay Trail Board meeting in Hercules. The City of Hercules will host us at their City Hall.

At this meeting, the board will consider the appointment and vote on new board member candidate **Kevin Mulder** of MTC; consider the transition of **Maggie Wenger**, from alternate to primary representative for BCDC; appointment of board members **Juan Raigoza** and **Steve McAdam** to the Steering Committee; and designation of Raigoza as Treasurer and McAdam as Secretary.

We will have a special presentation by Lance Fung and John Talley of Fung Collaboratives, our consultants for the Bay Trail's regional public art program known as ***Migrations***.

The Board will also hear a presentation from consultants 2M Associates about the **Bay Trail Design Guidelines & Toolkit** and will consider approval of the document.

After our meeting, we will carpool to the Bay Trail and walk along the newest section, a one-mile stretch built in Hercules last year.



RSVP



2016 Spring Bay Trail Board Meeting
Wednesday, March 30, 2016
Noon – 4:00 p.m.
Hercules City Hall, Council Chambers
111 Civic Drive, Hercules

Please fax, phone or e-mail your availability by **Friday, March 25**. Indicate attendance for each option below.

To: Laura Thompson
Phone: (510) 464-7935
Fax: (510) 433-5535
E-mail: laurat@abag.ca.gov

Name: _____

I will attend:

_____ Lunch (12:00 PM – 1:00 PM)

_____ Board Meeting (1:00 PM – 3:00 PM)

_____ Bay Trail Walk (3:00 PM – 4:00 PM)

I cannot attend: _____

**Hercules City Hall
111 Civic Drive, Hercules, CA 94547
Council Chambers**

DIRECTIONS

Driving

Hercules City Hall is located on Civic Drive near the junction of Highway 80 and Highway 4. From I-80 East, follow signs for Exit 23, Willow Avenue in Hercules. Keep right at the fork, follow signs for Sycamore Avenue and merge on to Willow Avenue. Turn left onto Sycamore, drive for ½ mile and turn left onto Civic Drive. City Hall will be on the left. Visitor parking is located near the building.

See Google maps for complete driving directions.





**SAN FRANCISCO BAY TRAIL BOARD OF DIRECTORS
SPRING 2016 MEETING**

Wednesday, March 30, 12:00 PM to 4:00 PM
Hercules City Hall, City Council Chambers
111 Civic Drive, Hercules, CA 94547

AGENDA

*The Board may act on any item on this agenda. Attachment included**

Time	Topic	Facilitator
Noon	Lunch	
1:00 p.m.	Call to Order	Chair
	Introductions / Agenda	Chair/Board
	<ul style="list-style-type: none"> • <i>Adopt Agenda</i> • <i>Adopt July 24, 2015 meeting minutes*</i> • <i>Board announcements</i> • <i>Staff Announcements</i> 	
1:15 p.m.	Welcome <i>City of Hercules representatives welcome the Bay Trail Board of Directors.</i>	City of Hercules
1:20 p.m.	Bay Trail Board Officers/Candidates* <i>Consider appointment and vote for the following: new Board member Kevin Mulder of MTC; Maggie Wenger as primary member for BCDC; Juan Raigoza and Steve McAdam as members of the Steering Committee, serving as Treasurer and Secretary respectively.</i>	Board/Staff
1:30 p.m.	Overview of Bay Trail's Regional Public Art Program, Migrations* <i>Staff and consultants FC Projects will provide an overview of our regional Bay Trail public art program, highlighting curatorial vision, details on a recent dedication, and funding opportunities.</i>	Lance Fung & John Talley
2:00 p.m.	Bay Trail Design Guidelines & Toolkit Approval* <i>Staff and consultants will provide an overview of the Bay Trail Design Guidelines & Toolkit.</i>	2M Associates, Placeworks

continued on next page

3:00 p.m. Adjourn Meeting

3:00 p.m. – Hercules Bay Trail Walk

4:00 p.m.

Join Bay Trail staff and the City of Hercules for a 1-mile walk along one of the newest sections of Bay Trail near the BioRad facility in Hercules.

**San Francisco Bay Trail
Summer 2015 Board Meeting Minutes
Facebook Campus, Menlo Park
July 24, 2015**

Call to Order

Meeting was called to order at 1:00 p.m.

Attendance

Board Members

John Woodbury, Chair
Tom Huening, Co-Chair
Bruce Beyaert
Julie Bondurant
Corinne DeBra
Leo DuBose
Jim Foran
Cecily Harris
Minane Jameson
Ellen Johnck

Karen Langdon
Diane Ross-Leech
David Lewis
Bill Long
Julia Miller
Dave Mitchell
Betty Moose
Rick Parmer
Antoinette Romeo
Don Weden

Guests

Justin Murphy
Nikki Nagaya
Jane Mark
Mark Williams
Juan Raigoza
Will Fourt
Duane Bay
Lauren Swezey
Marlene Finley

City of Menlo Park
City of Menlo Park
Midpeninsula Regional Open Space District
Midpeninsula Regional Open Space District
County of San Mateo
Santa Clara County Parks Department
Association of Bay Area Governments
Facebook
San Mateo County Parks

Staff

Laura Thompson
Lee Huo
Maureen Gaffney
Ben Botkin

Bay Trail
Bay Trail
Bay Trail
Bay Trail / Water Trail

Introductions / Agenda

Woodbury brought the Board meeting to order and introductions were made.

Agenda/Minutes

ACTION: **Beyaert moved, Moose seconded adoption of the 7/24/15 agenda and Harris moved, Foran seconded adoption of the 10/9/14 minutes. The agenda and minutes were approved unanimously.**

Yes votes:

John Woodbury, Chair	Karen Langdon
Tom Huening, Co-Chair	Diane Ross-Leech
Bruce Beyaert	David Lewis
Julie Bondurant	Bill Long
Corinne DeBra	Julia Miller
Leo DuBose	Dave Mitchell
Jim Foran	Rick Parmer
Cecily Harris	Antoinette Romeo
Minane Jameson	Don Weden
Ellen Johnck	

No Votes: None

Abstentions: None

Announcements

Board Announcements

- Jameson Announced that the Hayward Area Recreation District was developing language for a plaque to honor Bill Lockyer for his role in creating the Bay Trail legislation.
- Bondurant Informed the Board that the East Bay Regional Park District was going through the process to rename a section of the Bay Trail along the Hayward shoreline after Bill Lockyer, and was coordinating with HARD.

There was a discussion about ensuring a transparent process for naming sections around the region and the desire for Bay Trail staff to be involved in reviewing plaque language since it is affiliated with our brand.

Staff Announcements

- Thompson Announced that Sean Co has stepped down from the board after leaving the Metropolitan Transportation Commission and joining Toole Design Group. Sophia Recalde has also left the board after leaving the Solano Transportation Authority. Staff will work with both organizations to identify new board members. Informed the board that ABAG selected a consultant, Fung Collaboratives, to implement our regional art initiative called *Migrations*. Informed the board that through a Ridge Trail partnership, the Silicon Valley Trail Loop demonstration project, funded

in part by a Climate Ready grant from the Coastal Conservancy, is underway and collecting data about how trails can offset greenhouse gas emissions.

- Gaffney Informed the Committee that the new Bay Trail website is in the works and is expected to go live at the end of the year. (Lewis suggested that Bay Trail staff use project partners to help market the new site and drive users to it.) Gaffney also announced that a new trail is now open at Pond 10 in Napa County and progress is being made to formalize it. Informed the Committee that the Elevation 66 brewery in El Cerrito has created a Bay Trail Pale Ale!

- Huo Announced that the San Pablo Wildcat Creek Trail has been completed as part of a Bay Trail/Coastal Conservancy grant. In May the Ferry Point Loop Trail was completed with great fanfare in Richmond. Conversations are still underway about the design of a 5-year pilot for a separated bicycle/pedestrian pathway on the Richmond-San Rafael Bridge. Informed the Committee that the Bay Trail Design Guidelines/Toolkit work is underway.

- Botkin Informed the Board about progress on the Water Trail and announced that both the Bay Trail and the Water Trail will

Welcome

Lauren Swezey of Facebook welcomed the Board of Directors and staff to the Facebook campus. She reviewed the two sections of Bay Trail recently built by Facebook as a condition of development approval. She also introduced a new trail project called the Dumbarton Rail Trail that will follow the SamTrans railroad alignment from Redwood City to East Palo Alto, connecting to the Bay Trail at the Ravenswood Open Space Preserve. Design is underway now with construction anticipated in 2018.

Bay Trail Board Candidates

Thompson introduced Juan Raigoza, Controller for San Mateo County, as a candidate for board membership. Raigoza gave the board of directors an overview of his work and interest in serving the project.

ACTION: Miller moved, Harris seconded confirmation of Juan Raigoza as a member of the Bay Trail Board of Directors. The vote was approved unanimously.

Thompson introduced Antoinette Romeo, a planner with Santa Clara County Parks, as a candidate for the designated representative on the Bay Trail Board after Elish Ryan's departure. Romeo has served as an alternate to Ryan. Romeo gave the board of directors an overview of her work and interest in serving the project.

ACTION: Foran moved, Parmer seconded confirmation of Antoinette Romeo as a primary member of the Bay Trail Board of Directors. The vote was approved unanimously.

Thompson introduced Will Fourt, a planner with Santa Clara County Parks, as a candidate for alternate on the Bay Trail Board to Antoinette Romeo. Fourt gave the board of directors an overview of his work and interest in serving the project.

ACTION: Weden moved, Long seconded confirmation of Will Fourt as an alternate member of the Bay Trail Board of Directors to Antoinette Romeo. The vote was approved unanimously.

John Woodbury, Chair	Karen Langdon
Tom Huening, Co-Chair	Diane Ross-Leech
Bruce Beyaert	David Lewis
Julie Bondurant	Bill Long
Corinne DeBra	Julia Miller
Leo DuBose	Dave Mitchell
Jim Foran	Rick Parmer
Cecily Harris	Antoinette Romeo
Minane Jameson	Don Weden
Ellen Johnck	

No Votes: None

Abstentions: None

Tom Huening Recognition

The Board recognized Huening for his tenure on the Bay Trail Board of Directors since 1993 as Supervisor and Controller of San Mateo County. Huening was a champion of Bay Trail along the San Mateo County shoreline and participated in key legislative meetings with staff. The board joined staff in thanking Huening for his dedication and contributions to the Bay Trail Project.

Completing the Ferry Point Loop Trail

Beyaert provided an overview of over fifteen years of work on the part of the Trails for Richmond Action Committee, City of Richmond, Port of Richmond, East Bay Regional Park District and the private sector to complete the 4.4-mile Ferry Point Loop Trail, dedicated at a public event on May 31, 2015 to a crowd of over 200 people. He provided examples of creative approaches and partnerships to completing the Bay Trail in Richmond. The Ferry Point Loop required acquisition of easements from four private property owners and 12 separate trail sections each with their own design/construction/permitting process. This project in Richmond serves as a model for Bay Trail completion region-wide.

Board Officers

Thompson walked through the Steering Committee recommendations for board consideration of officer positions. The board discussed appointing additional members to the Steering Committee, approval of a new co-chair and the importance of designating board officer positions of chair, co-chair, secretary and treasurer in accordance with the Secretary of State's regulations for non-profits.

ACTION: DuBose moved, Miller seconded the motion to add two members to the Steering Committee for a total of seven. The vote was approved unanimously.

John Woodbury, Chair	Karen Langdon
Tom Huening, Co-Chair	Diane Ross-Leech
Bruce Beyaert	David Lewis
Julie Bondurant	Bill Long
Corinne DeBra	Julia Miller
Leo DuBose	Dave Mitchell
Jim Foran	Rick Parmer
Cecily Harris	Antoinette Romeo
Minane Jameson	Don Weden
Ellen Johnck	

No Votes: None

Abstentions: None

ACTION: Weden moved, DuBose seconded the motion to appoint Julie Bondurant as the co-chair of the Bay Trail Board of Directors. The vote was approved unanimously.

John Woodbury, Chair	Karen Langdon
Tom Huening, Co-Chair	Diane Ross-Leech
Bruce Beyaert	David Lewis
Corinne DeBra	Bill Long
Leo DuBose	Julia Miller
Jim Foran	Dave Mitchell
Cecily Harris	Rick Parmer
Minane Jameson	Antoinette Romeo
Ellen Johnck	Don Weden

No Votes: None

Abstentions: Bondurant

Model Bay Trail Partnership: Menlo Park, East Palo Alto, Midpeninsula Regional Open Space District

Thompson provided an overview of the ongoing multi-agency partnership working to complete the Ravenswood Bay Trail connection in Menlo Park and East Palo Alto. The Ravenswood Bay Trail Connection is the last remaining gap in an 80-mile continuous stretch of Bay Trail that traverses three counties. The initial planning work was funded in part through a Bay Trail grant, and now the Midpeninsula Regional Open Space District is working to secure a trail easement with the SFPUC. Funding has been secured for all components of the project and construction is expected to begin in 2017.

Adjourn Meeting

Meeting was adjourned at 3:00 p.m.

Menlo Park/Facebook Bay Trail Ribbon Cutting & Trail Walk

Board members, Bay Trail staff, Facebook representatives and Menlo Park officials gathered to cut the ribbon on the new Bay Trail tunnel segment under Highway 84 connecting the two campuses. The group walked along the Bay Trail and viewed the campus on the southern side of the highway.

Kevin Mulder
Active Transportation & Complete Streets Planner
Metropolitan Transportation Commission
kmulder@mtc.ca.gov

March 18, 2016

Laura Thompson
Bay Trail Project Manager
Association of Bay Area Governments
laurat@abag.ca.gov

Dear Laura,

I would like to thank you very much for the opportunity to join the Bay Trail Board of Directors! I am excited to serve on the board of such an important regional asset and help to advance the important work that you do. The Bay Trail is a great example of the type of facility that every community should have to boost multimodal transportation for so many daily purposes.

In my current role as Active Transportation & Complete Streets Planner at MTC, I work to advance bicycle and pedestrian usage and access through policy, technical assistance, projects, and programming. From bike share to Complete Streets policies to bicycle and pedestrian counts, my work has a varying amount of interaction with the Bay Trail, but my professional goals match very closely with the Bay Trail mission and I would welcome the opportunity to develop the interaction even more.

I look forward to joining the rest of the Board in supporting walking and cycling around the Bay by connecting residents and visitors to amenities, jobs, and each other.

Sincerely,

Kevin Mulder
kmulder@mtc.ca.gov
510-817-5764
Metropolitan Transportation Commission
101 Eighth Street
Oakland, California 94607

San Francisco Bay Conservation and Development Commission

455 Golden Gate Avenue, Suite 10600, San Francisco, California 94102 tel 415 352 3600 fax 415 352 3606

2/29/16

Bay Trail Board of Directors
101 Eighth Street
Oakland, CA 94607

Dear Bay Trail Board of Directors,

I would like to express my interest in becoming a Board and Steering Committee Member with the Bay Trail Project as a representative of the San Francisco Bay Conservation and Development Commission.

I have worked in the planning division at BCDC for three years, first as a NOAA Coastal Fellow and now as a coastal plan analyst. I have worked with park districts and communities in the East Bay to preserve and improve shoreline recreation and public access in the face of sea level rise and storm events. For the past 18 months, I have served as our alternate on the Bay Trail Board and Steering Committee and will carry this experience into my future service. BCDC has a long history of approving (and requiring) public access along the Bay shoreline. Our partnership with the Bay Trail Project is integral to coordinated, high-quality shoreline recreation for the entire Bay Area population. I look forward to working with Bay Trail staff, the Board of Directors, and other partners to develop and maintain sustainable trails around the region.

In addition to my professional interest in the Bay Trail, I am a bike commuter and frequent user of the Bay Trail. I will attend the March 7th steering committee meeting and answer any questions about my background or role on the Board.

Sincerely,



MAGGIE WENGER
Coastal Plan Analyst II

August 25, 2015

Laura Thompson
Bay Trail Project Manager
Association of Bay Area Governments
101 Eighth Street
Oakland, CA 94607

Dear Laura,

As you know, I am interested in serving on the Bay Trail Steering Committee. Having been on the Project Board of Directors since its inception and having worked on San Francisco Bay issues for over 30 years, I feel that I can assist the Steering Committee in its important work.

I appreciate the Steering Committee's willingness to consider me for this task.

Sincerely,



Steve McAdam

Juan Raigoza
264 Elwood Street
Redwood City, CA 94062

August 27, 2015

Ms. Laura Thompson
Project Manager
San Francisco Bay Trail
101 Eight Street
Oakland, CA 94067

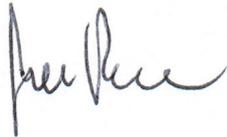
Dear Ms. Thompson

I am submitting this letter of interest to fill the role of Treasurer of the San Francisco Bay Trail (SFBT) Board of Directors, a non-profit, and to serve as a SFBT Steering Committee member.

As a long-time Bay Area resident who enjoys cycling, hiking and walking, I am very interested in working with others to help complete the 500-mile network of trails around the Bay. We are lucky to live in such beautiful surroundings which we need to conserve and make more accessible to individuals. I believe my formal education coupled with my work experience will enable me to contribute to the work done by the SFBT and its Steering Committee.

Thank you for your consideration.

Best Regards,

A handwritten signature in black ink, appearing to read 'Juan Raigoza', written in a cursive style.

Juan Raigoza



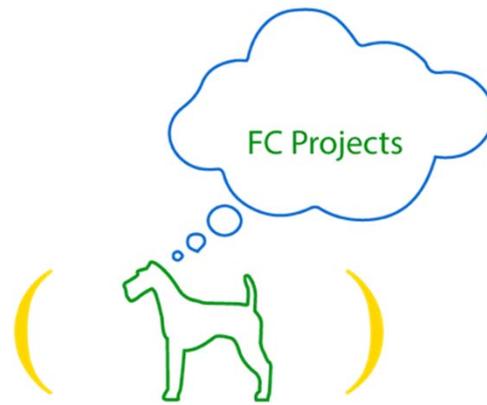
#

Migrations

Migrations will create destination art experiences along existing sections of the San Francisco Bay Trail that appeal to a broad audience, encouraging people to gather, connect and experience something new and inspiring along the shoreline, linked by over 340 miles of Bay Trail in all nine Bay Area counties. *Migrations* has the potential to involve 47 shoreline cities, nine counties, local, regional, state and national parks, ports, marinas and other shoreline management agencies, reinforcing the connectivity between cities and promoting the trail as a unique destination for art enthusiasts. Cities will serve as hosts of the artwork and will work closely with the Association of Bay Area Governments and FC Projects to initiate and implement art exhibits. Internationally renowned curator Lance Fung conceived *Migrations* and will oversee the ongoing exhibition. He has developed an art advisory committee of leading public art professionals from the Bay Area. An environmental advisory committee is being developed with a representative from the Bay Conservation and Development Commission as our first member.

Migrations was launched with a temporary project in Redwood City on October 25, 2015. Artist Michael Koler created a huge public event where residents of all ages participated in stomping in mud, sand, straw and water to create an adobe like substance. This material was applied to the artist's structural forms resulting in a community-made series of park benches for Redwood City.

The *Migrations* team has introduced the initiative to many cities and will continue to do so with the hopes of developing partnerships to realize art installations that are relevant to the environment and community that it serves. Ongoing fundraising strategies are in place with the goal to create at least one new artwork per year.##



MIGRATIONS

Ephemeral, Temporary, Semi-Permanent, Permanent
Public Art Interventions and Installations on the
San Francisco Bay Trail

ABAG + Bay Trail + FC Projects + BCDC + Cities +

Create Community involved artworks about the environment

Bring people to nature in their own backyards

Add to the thriving experience of the Bay Trail

Educate and elevate the Bay Area's arts & culture scenes

Curatorial Advisory Committee:

Jennifer Easton, BART

Kristen Zarmeba, City of Oakland

Elise de Marzo, City of Palo Alto

Steven Huss, City of Walnut Creek

Peter Hutchinson, Earth Artist

Cai Guo-Qiang, Installation Artist

Environmental / Trail Advisory Committee

Laura Thompson, Bay Trail

Jaime Michaels, BCDC

Flexible projects based on:

Bay Trail needs

Sites / BCDC approvals

Community Desires

Funding

Fundraising efforts:

Outreach to cities

Outreach to local companies

Outreach to local foundations

Public Art Grant applications:

Bloomberg - \$ 1,000,000 – 2014

Kresge - \$ 1,000,000 – 2015

ArtPlace - \$ 250,000 – 2016

Harmambee by Michael Koliner in Redwood City – Oct 2015



Thrown Rope by Peter Hutchinson







Proposals by John Roloff for City of Palo Alto / Exploratorium

CONCEPTUAL STUDY: LANDSCAPE MIGRATION / SAN ANDREAS SHIP I (PLIOCENE > PLEISTOCENE > ANTHROPOCENE)
PALO ALTO SHORELINE / SAN FRANCISCO BAY / JOHN ROLOFF © 2013



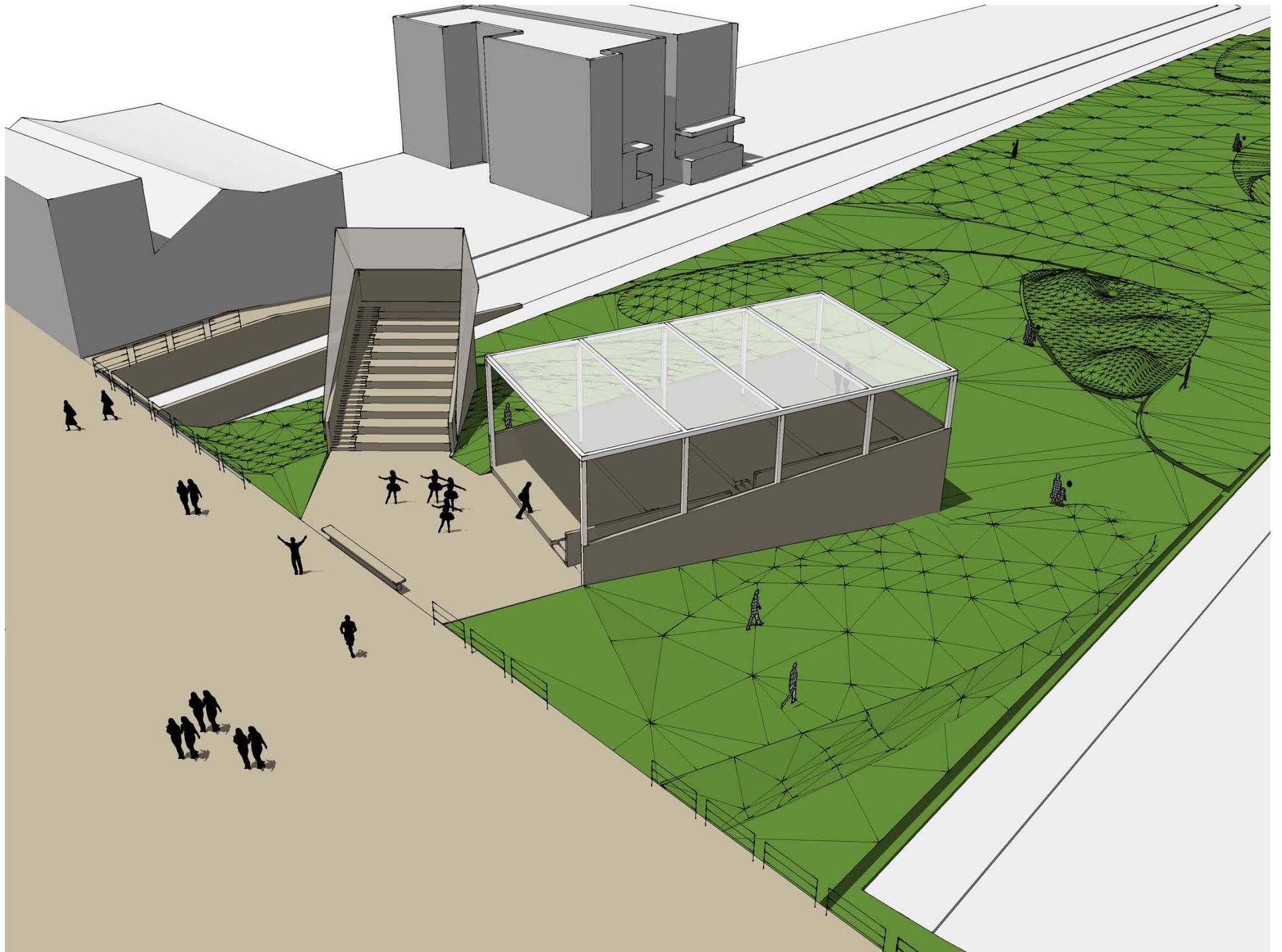
ALONG THE PERPETUAL TRAIL OF JOURNEY AND MIGRATION IS AN OASIS SHIP (OF EOCENE FLOEA IN ANTHROPOCENE TIMES) - A PARALLEL JOURNEY/MIGRATION SHELTERING THREE SPECIES: EQUIPPUS AGOSTIDENS (THE DAWN HORSE), CAMELOPS HESTERNUS (NORTH AMERICAN CAMEL) AND HOMO SAPIENS (OUT OF AFRICA) - THEIR TRACKS INTERMINGLE ON THE TRAIL.

EQUIPPUS AGOSTIDENS (DAWN HORSE)
EOCENE

CAMELOPS HESTERNUS
EOCENE > PLEISTOCENE

HOMO SAPIENS
PLEISTOCENE > ANTHROPOCENE

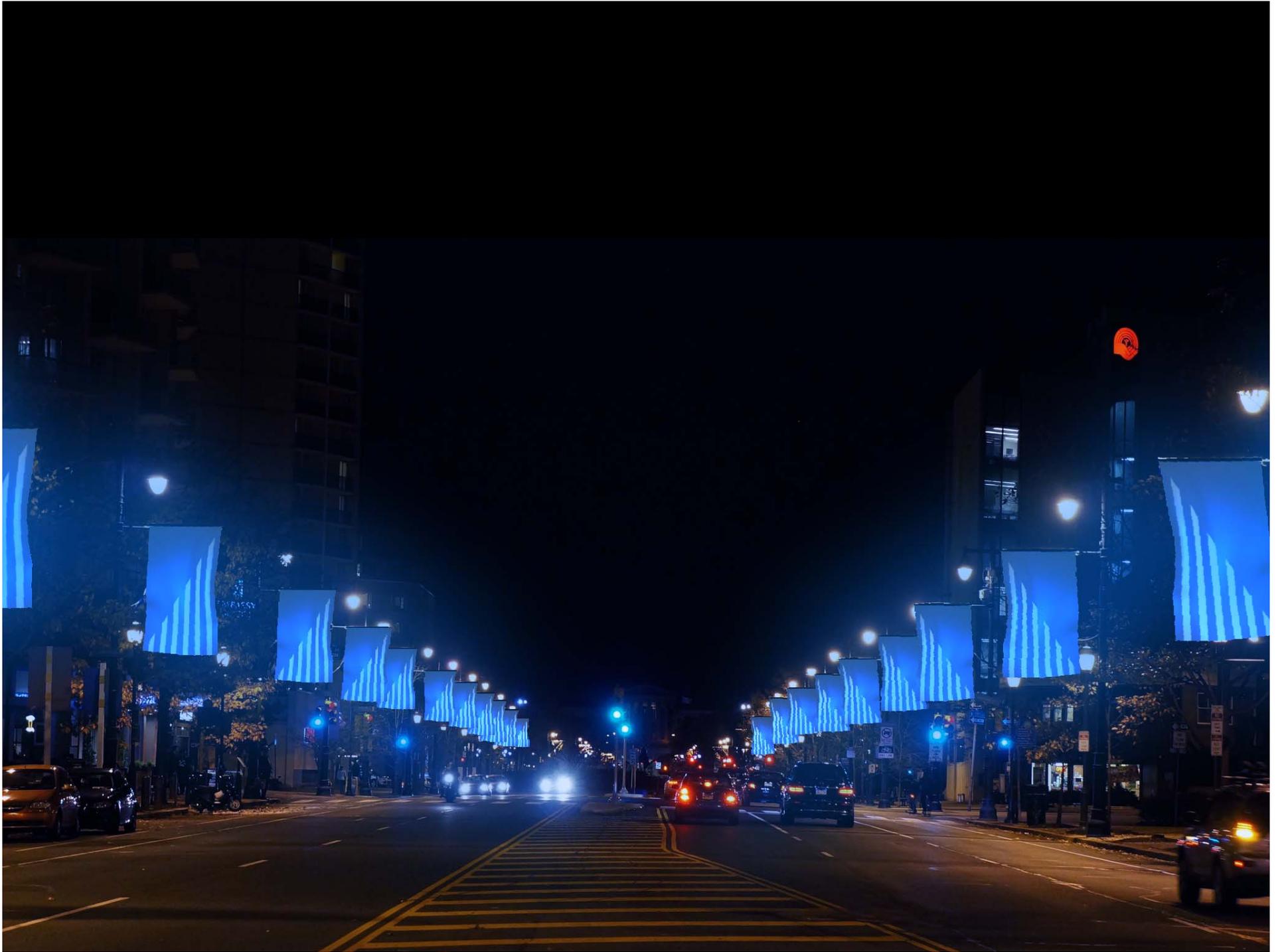
THE SHIP (MIGRATING LANDSCAPE) IS MOVING AT A DIFFERENT PACE. THE THREE MIGRA- TIONS OF LAND, FLORA AND FAUNA COALESCE AT A SITE ALONG THE PALO ALTO SHORE- LINE WHERE THE CONTEMPORARY VIEWER MAY SEEK REFUGE AND CONTEMPLATE CHANGES AND JOURNEYS OF DIFFERENT ORDERS.





Flags of Peace by Daniel Buren for new Facebook Corridor







Untitled by Robert Barry



The Ship of Tolerance by Ilya & Emilia Kabakov







Lance Fung, Founder & Curator

John Talley, Executive Director

501C3

www.fungcollaboratives.org

MEMO

Date: March 22, 2016
To: Bay Trail Board
From: Lee Huo
Subject: Approval of the Bay Trail Design Guidelines and Toolkit

BACKGROUND

Since the inception of the Bay Trail Project, the only design guidelines used by the Bay Trail are the Class I trail standards established by Caltrans in their Highway Design Manual. Over the years, this limited set of design guidelines has proven to be inadequate in addressing the complexities of designing the Bay Trail through many challenging environments and circumstances. It also proved insufficient in imparting the ultimate vision of the Bay Trail in a manner that would inspire trail designers and developers to create trails that fulfill the Bay Trail vision.

Over the last year, Bay Trail staff has been working with a consultant team led by 2M Associates, to develop a more robust Bay Trail Design Guidelines and Toolkit in order to assist Bay Trail staff in their everyday work as they engage a wide variety of stakeholders. The purpose of the Design Guidelines and Toolkit is to 1) impart the vision and principles of design for the Bay Trail and 2) provide design guidance and a design resource that will aid the development of the Bay Trail in a manner that results in a regional trail system that provides an enjoyable, safe, continuous, and useable experience for the broadest range of non-motorized users possible.

The Design Guidelines and Toolkit are intended as a guidance and technical resource to Bay Trail staff, public agencies, private developers, and the general public to assist in the planning and design of Bay Trail facilities, to provide general design solutions/recommendations for common trail design issues, and to provide a basis for discussions of Bay Trail design criteria. The Design Guidelines and Toolkit are not intended to provide a “one-size-fits-all” solution. The design for many trail projects are dependent on the specific circumstances of the project site. The Design Guidelines and Toolkit does provide solutions to many common design issues related to the Bay Trail, however the hope is that it will also inspire creative solutions to challenging Bay Trail design issues. Although the document will capture many design scenarios, it is impossible to capture them all.

However, the Design Guidelines and Toolkit are intended to be a “living document” that will be available in both a hardcopy format and an electronic format and that can be easily modified by Bay Trail staff over time to update and add to the Design Guidelines and Toolkit as new design issues, solutions, and practices arise.

The Design Guidelines and Toolkit provided with this memo is the culmination of almost a year of work between Bay Trail staff and the 2M Associates team. The Bay Trail Steering Committee reviewed the draft document at its March 7, 2016 meeting, and Bay Trail staff provided the draft to all Bay Trail Board members for review. As a result, the Design Guidelines and Toolkit includes changes based on comments provided at the Steering Committee Meeting and written comments provided by members of the Full Bay Trail Board. Although we were able to incorporate many of the suggested changes, some were beyond the scope and purpose of the Design Guidelines and Toolkit. Please refer to the Comments and Responses document provided with this memo for details.

RECOMMENDATION

Bay Trail staff is recommending that the Board approve the Design Guidelines and Toolkit and authorize staff to update it as needed over time. Although the Design Guidelines and Toolkit are intended to be a tool and resource for staff and not new policies or regulations, we are asking for the Board’s approval to confirm its support for the final document and concept.



3/18/16 REVIEW COMMENTS AND RESPONSES: 2-22-16 DRAFT REPORT

ANTOINETTE ROMEO

COMMENT	RESPONSE
<p>Introduction & Purpose : Suggest a statement similar to what is written on page 10 “Collaboration” to clarify that these design guideline are intended to be compatible with Federal, State and local agencies’ trail policies, standards, specifications/guidelines for segments of the Bay Trail within an agencies boundaries should be included. In instances when these differ, the agency policies/standards should take precedent although this doesn’t need to be stated. This intent is generally stated in the Introduction, and in the Design Comprehensively section, but I think it is important to restate it in the beginning so that users are aware that trail designs & standards may differ on segments of the Bay Trail. Lighting, signage, uses, and hours of operation are also influenced by the policies and standards of the managing (regional and local agencies) agencies and may vary on segments where the Bay Trail runs through agency property.</p>	<p>Phrase added on Introduction page: “are intended to complement federal, state and local standards and guidelines.”</p>
<p>Page 4, bullet point 2: “consists of either dedicated bicycle lanes or cycle tracks with complementary pedestrian walkways and promenades in some areas where a shoreline, off-street, multi-use trail may not be achievable.”</p> <p>The way this is stated implies that the Bay Trail is primarily a bicycle trail and that bicycle lanes take precedent over other uses, e.g. pedestrians, which is not the intent of the Bay Trail. I think the guidelines should emphasis that the Bay Trail is a multi-use trail as it is stated in 3.3.</p>	<p>Changed to read: “consists of a shoreline, off-street, multi-use trail, or in some cases where a trail may not be achievable, either dedicated bicycle lanes or separated bikeways with complementary pedestrian walkways and promenades.”</p>
<p>Page 10, Collaboration: “Designing the Bay Trail should not be done in a vacuum. There are numerous local and regional agencies whose individual policies and standards about the Bay Trail and its setting need to be considered. These will vary from trail segment to trail segment. Communication among involved professionals is paramount to a successful design that can be both permitted and constructed.”</p> <p>Appreciate recognition that other agencies policies and standards need to be considered in the bay trail design guidelines. Users should understand that trail surfaces and widths may not be uniform on all segments of the Bay Trail depending on the policies and standards of the local and regional agencies through which the Bay Trail may</p>	<p><u>Response:</u> Agreed. However, while existing policies and standards of local jurisdiction may be all over the map, these Guidelines are intended to help “lead” local agencies and jurisdictions to a more common understanding of design for the Bay Trail that enhances the user’s experience. We are recommending no changes.</p>

COMMENT	RESPONSE
<p>pass. Accessibility and trail classifications (e.g. multi-use) may also be influenced by the standards of the individual agencies</p>	
<p>Page 13. Section 3.1: provide safety and security lighting (add in certain areas, or where feasible) Stated in this way implies that lighting would be along the entire trail – lighting can impact wildlife as well as affecting then aesthetics of a bay front trail.</p>	<p>Changed to read: “Providing safety and security lighting where needed to facilitate use 24 hours where appropriate.”</p>
<p>Page 18. Section 3.6 Wildlife Habitat: The design of the Bay Trail and adjacent habitat area should complement each other however habitat and species protection should take precedent over siting the Bay Trail.</p> <p>Locating the Bay Trail and related use areas to avoid habitat fragmentation, vegetation trampling, and erosion. If there are sensitive species that may be impacted by human disturbance then the species’ needs should dictate the siting of the Bay Trail and the trail should be sited to avoid such areas.</p>	<p>Introduction changed with new sentence as follows: “In some locations, the Bay Trail’s setting is composed of the Bay’s open waters, tidal mudflats and wetlands, seasonal wetlands, and upland edges used by migratory waterfowl and resident wildlife species, some of which are threatened or endangered. The design of the Bay Trail and adjacent habitat conditions should complement each other through thoughtful trail siting and design to minimize or eliminate public access and wildlife compatibility concerns. In some cases, the Bay Trail may be a benefit to habitat conditions by directing use away from random informal access that disrupts habitat.”</p>
<p>Page 32, General Locale: The managing agencies may also have regulations or use restriction which differ, for example Santa Clara County Parks have a 15 mph (or lower depending on conditions) bicycle speed limit on our trails and on multi-use trails, bicycles must yield to hikers/pedestrians. I didn’t see a statement in the guidelines that reflects this. Perhaps there should be an additional paragraph under <i>General Locale</i> that speaks about this. In addition, not all segments of the Bay Trail may accommodate or allow bicycle commuter lanes.</p>	<p>On Page 32 in Horizontal Trail Alignment the text was changed to read: “ The Bay Trail is one of the most popular shared-use trails in the Bay Area. The horizontal alignment of the Bay Trail is defined in part by a bicycle design speed. Lower . . . <u>Response:</u> The “general locale” section is essentially an overview of settings. Specific design tools, like speed limits, are discussed in Chapter 5.</p>
<p>Page 22, General Locale: add a Regional Parklands section.</p>	<p><u>Response:</u> The text already includes “regional” . . . parks and recreation areas. We debated this. In trying to differentiate all the different types of public land nomenclatures used by various agencies it became a lengthy discussion and ultimately led to the decision to not try and have different sections for urban plazas, local parks, regional parks, regional open space areas, state parks, national parks etc.</p>
<p>Page 23, Secure Land Uses: 5th line “ports” misspelt as “portsl”</p>	<p>Text changed</p>
<p>Page 51 and 55: The two statements regarding lighting</p>	<p>Page 53 changed to read:</p>

COMMENT	RESPONSE
<p>are somewhat conflicting, perhaps use the statement on page 55 for consistency or something along the lines of Avoid lighting in sensitive habitat areas wherever possible, if lighting is necessary, locate night lighting away from sensitive habitat areas.</p> <ul style="list-style-type: none"> • Page 51 Lighting: Locate night lighting away from sensitive habitat areas. • Page 55: Avoid lighting that would conflict with wildlife habitat or sensitive species. 	<p>“Avoid lighting that would conflict with wildlife habitat”</p> <p><u>Response:</u> Agree. Page 51 is about wildlife compatibility so the tool should be to simply “avoid” lighting if it is shown to be incompatible with adjacent wildlife. That is not the same as a mandate to “not” have lighting. So the option is there based on local agency requirements.</p>
<p>Page 53, Landscaping: some management or regulatory agencies have specific lists of allowable plants & trees which can be planted along the bay, this should be reflected in the design guidelines. Bullet Point 4: perhaps stated as: use native plants & trees local to the area or that are approved for use in bay-marsh, riparian or upland riparian areas and that provide habitat for wildlife, whenever possible.</p>	<p>Changed to read: “Use native plants local to the area that provide habitat for wildlife whenever possible.”</p>

BRUCE BEYAERT

COMMENT	RESPONSE
<p>Overall Comments: The generalized, philosophical Guidelines will be read and considered primarily by consultants and government agencies working with a blank slate, e.g. in preparing master plans and specific plans or planning big-buck projects. It is the Tool Kit which will be useful for most Bay Trail gap closure projects undertaken by government agencies and the private sector, because it contains expectations for trail design parameters. The first question asked by government regulatory agencies, as well as by agencies and developers planning to build a Class I Bay Trail, is how wide does it need to be. The Tool Kit also will be important in addressing other critical needs such as horizontal & vertical clearances and separation from roadways — needs that too often fail to receive early consideration.</p>	<p>The graphic on page 31 has been amended with “BAY TRAIL” to show that the overall width is 18 feet, the paved section plus the shoulders.</p> <p><u>Response:</u> Pages 32 and 33 describe horizontal and vertical clearances.</p>
<p>The Tool Kit should be expanded to cover important engineering design parameters such as trail cross slope, thickness of AC, thickness & compaction of AB rock and compaction with polymer stabilization of DG, plastic boards at outer edge of DG shoulders, etc.</p>	<p>Graphics of page 52 have been changed to show cross-slope.</p> <p><u>Response:</u> Every section of trail is different and one common set of recommendations about detail engineering design parameters is not appropriate or feasible for the Guidelines due to varying soil conditions and topography at each project site. Detail design parameters need to be based on geotechnical recommendations (see Pages 19 and 52).</p>
<p>A table should be added to the Tool Kit containing all of the trail design parameters for ready access — analogous</p>	<p><u>Response:</u> There are too many design variables to put clearly into one succinct table where the</p>

COMMENT	RESPONSE
to the design guidelines table now used. Also, a Table of Contents also is needed for the entire document.	philosophy being presented is that design should be thought of comprehensively. If such a table were developed, people would likely only look at the table without reading the rest of the guidelines and use the numbers in the table as the bare minimum necessary to construct the Bay Trail, which defeats the purpose of the Guidelines.
Page 2: The second paragraph should recognize that the Bay Trail also goes around San Pablo Bay.	“San Pablo Bay” and “San Francisco Bay” has been added to the map graphic.
Page 5: Referring to item 4, the "other national, state and local guidelines” could be deleted as few would leisure time to explore them.	Change made.
Page 10: The Width & Sightlines section should include or at least refer to the specific recommendations contained in the Tool Kit. Horizontal and vertical clearances, as well as Class I trail separation from roadways, also should be covered in this design section.	<u>Response:</u> The first four chapters are purposefully void of technical considerations, as they are intended to impart the vision and design principles of the Bay Trail. More detailed design recommendations are covered in Chapter 5, the Toolkit.
Page 22: The Oakland Park St. bridge area photo is a bad example of condos or apartments crammed close to the trail. Delete it and use an example with greater setback from trail, e.g. the attached photo of Marina Bay in Richmond.	This photograph on page 22 seems fine. Kept.
Page 23: The Heron’s head park photo is a very bad piece of guidance with strands of barbed wire topping a chain link fence. For obvious reasons, the Richmond Municipal Code prohibits barbed wire on fencing.	Photo changed.
Page 30: The definition of “Trail” should be revised to include shoulders, which are often preferred by pedestrians, especially those with foot problems such as neuromas and arthritis. Also, note that horizontal clearances should be measured from outer edges of shoulders.	Text changed to “paved and/or natural surface”.
Page 30: The discussion of the “Trail Shoulder” first sentence should state clearly that it is an integral part of the trail, rather than a safety buffer for bicyclists whatever that might mean. Rather, it is a safety area for pedestrians to avoid being run down by cyclists.	Text has been changed.
Page 30: Cycle Tracks aren’t only for a "street environment", i.e. they may be adjacent to a Class I multi-use or ped trail.	Text has been changed.
Page 31: Referring to comment above, the shoulder should be defined as part of the trail. Given the discussion of planning for growth in trail use, I’m surprised that the 18’ minimum overall width remains the same as current guidance of 10’ paved with 2’ shoulders plus 2’ minimum horizontal clearance from outer edge of shoulders. This is less than Caltrans recommended 3’ horizontal clearance. Clearance of 3’ should be recommended between fences/walls and the outer edge of trail shoulders, because	The graphic on page 31 has been amended with “BAY TRAIL” to show that the overall width is 18 feet, the paved section plus the shoulders. <u>Response:</u> The suggestion that the trail be defined as paved, shoulders for pedestrians (and bicycle clear space) and additional clear space would make the trail corridor 22 feet wide. These Guidelines do not preclude any

COMMENT	RESPONSE
those using the shoulder can't walk or jog against a fence or wall.	jurisdiction from providing more horizontal space than identified.
Page 32: Please delete form paragraph 1 the bad example of 20 mph or higher bicycle speeds, because many, e.g. EBRPD, have ordinances with a 15 mph limit.	On Page 32 in Horizontal Trail Alignment the text was changed to read: "The horizontal alignment of the Bay Trail, as a paved shared-use facility, is defined in part by a bicycle design speed decided on a project by project basis. Low design speeds. . .
Page 32: Add to the Alternative Surfaces section that stabilizers should be used with compacted DG and that coarse crushed rock should be avoided as painful to those with foot problems such as neuromas and arthritis. It would be helpful to recommend standards for compaction of DG and use of polymer stabilizers.	<u>Response:</u> Text states that the surface should be "firm and stable" which is a legal requirement and implies "stabilized". These are guidelines and not intended to be a primer on the detail engineering of the Bay Trail. There are too many varieties of DG and gravel, either stabilized or not, and types of stabilizers on the market to detail these when such decisions are subject to the conditions of the local environment and the regulatory agency. Staff is considering a separate document to answer questions from jurisdictions about surface options.
Page 33: The Obstructions section seems to state that it is OK to have a curb, wall, railing, etc. within 3' of the paved surface, i.e. adjacent to edge of trail shoulder. Rather, such obstructions should be 3' recommended and 2' minimum from outer edge of shoulder. People can't jog or walk against a wall, railing, etc.	Text changed to read " When an obstruction is unavoidable within the trail shoulder, a solid white stripe should be located along the edge of the trail to visually notify the Bay Trail user about the presence of the obstruction." <u>Response:</u> The suggestion is not to put an obstruction in the trail or shoulder; just the opposite. However, there are often obstructions that while not desirable or wanted, need to be addressed. And in other conditions, such as in a tunnel, there is no "shoulder".
Page 34: Based on TRAC'S experience, bollards should be installed when the trail is built. When bollards weren't installed initially, retrofit always has been necessary due to motor vehicle incursions.	<u>Response:</u> The direction is to discourage bollards. The timing of including bollards is up to the managing agency.
Page 35: The separation distance specified should be from outer edge of trail shoulder, rather than the paved surface. Caltrans' minimum is 5' without a physical barrier.	<u>Response:</u> The Highway Design Manual Chapter 1000 has a mandatory design standard that states: "The minimum separation between the edge of pavement of a one-way or a two-way bicycle path and the edge of traveled way of a parallel road or street shall be 5 feet plus the standard shoulder widths." The standard shoulder width is 2 feet. 5+2 = 7.
Page 36: Center lines don't add enough value to justify the cost of installation and maintenance. None of Richmond's 32 miles of Bay Trail has a center line with	<u>Response:</u> Agree that centerlines are not necessarily desirable and most agencies try to avoid them. However, there are many

COMMENT	RESPONSE
the exception of decorative lines with a ship symbol already fading on the Shipyard 3 Trail. Re underground utilities, it is common to have Bay Trail, sidewalks and roads built over petroleum product pipelines in Richmond. Delete the Point Richmond photo showing the bad situation of stop signs on the Bay Trail.	conditions where centerlines need to be used as mitigation for not meeting mandatory design standards, or to direct use.
Page 37: The water quality section should recognize that runoff permeates trail shoulders. What is a HDM as discussed in the Mandatory Design Safety section?	Text changed. HDM has been spelled out.
Page 40: I suggest a wider 6' bike lane for all roadways as is recommended in Richmond's Bicycle Master Plan. I also suggest deleting the section on destination trails stating that 8' width is acceptable for a bidirectional multi-use trail. It is a bad idea to give gravel a blanket endorsement, because it can be very coarse, painful and slippery for walking as well as cycling. This needs to be fleshed out with a recommendation against coarse gravel and for top dressing with fines where it is used.	Text changed to 6 feet wide. Qualification of "short" added to point access trails.
Page 43: I question the worth of placing arrows in advance of trail intersections. Note that the arrow seems to be inverted in the upper right image suggesting that the trail goes underground.	The intent of placing arrows is for instances where it's necessary for wayfinding along the Bay Trail where it may not be clear where to continue to stay on the Bay Trail. Graphic changed.
Page 52: Recommend adding 2% slope for paved surface and plastic board edging at outer edge of DG shoulder. The Drainage section should recognize that trail shoulders are permeable.	"Slope" and arrows added to graphics.
Page 56: Specify that fencing should not be topped by barbed wire, e.g. the Richmond Municipal Code prohibits it. It would be impractical in many cases to have a setback so great that "an object" couldn't be thrown into an area.	Text changed. <u>Response:</u> Somewhat regretfully, the use of barbed wire of any sort is up to the managing agency. There are a number of high security land uses that dictate barbed / concertina wire be used.

JULIE BONDURANT

COMMENT	RESPONSE
Chapter Dividers: Do not like fuzzy photos.	Layout and design of chapter dividers are imbedded in design of the document and would require significant work and time to change appearance.
Page 10, Photo: Better example of paved jogging.	Photo being reviewed for better example. However, this one does show a jogger.
Page 12: Box numbers hard to read	Box numbers enlarged for readability and drop shadows added.
Page 13: Providing security for lighting conflicts with habitat requirement and most park standards. Maybe modify to say "In highly urban areas with night activity and /or where trail serves as primary transportation	A qualifier "where appropriate" was added.

COMMENT	RESPONSE
corridor and as a security measure in tunnels”	
Page 14: There are two objectives with different solutions. On has to do with the design of the trail. The second is to provide direct pedestrian and bicycle connections that will increase the use of the trail.	Sub-headings “Continuity” and “Connectivity” added to text.
Page 14: Design of amenities associated with connecting transit should include bike racks, on-bus /ferry/train wayfinding to station including real-time app, bike stations.	An additional objective was added.
Page 15: Photo and Graphic. Fuzzy? Leader line not pointing appropriately. Font size and color distracting, But I do like highlighting key points.	Leader line changed. Font size and color reevaluated.
Page 15: Last Bullet. Reword.	Text changed.
Page 17: Photo. Where is the pedestrian sidewalk? Leader line not pointing appropriately. Consider removing solutions form other areas (Austin).	Photo being reviewed for better example.
Page 18: Change to read “Directing trail lighting away from habitat areas, <u>or do not light at all.</u> ”	Text changed.
Page 18: Middle Photo. Show a more positive sign such as “Resource Protection Area, Stay on Trail”	Photo changed.
Page 19: Redundant sentence.	Removed first sentence. Changed second to read” While scientific uncertainty remains regarding the pace and amount of future sea level rise, the Bay Trail design should use the most current regional sea level rise projections available”
Page 23, Photo Upper Left: Showing the welcoming sign juxtaposed with barbed wire fence gives two messages and does not provide the most aesthetic solution to a security concern.	Photo changed.
Page 23, Photo Upper Right: This guardrail would hardly be considered a security measure.	Label refers to “barriers”.
Page 23, Photo Lower Left: No security measures shown.	Replaced with photo from Stanley crossroad in Napa.
Page 23, Photo Lower Right: Does not explain how habitat is protected.	Replaced with photo of San Mateo shoreline with habitat buffer.
Page 24: Photos do not show BT passage through an urban plaza.	The lower photo at Cryer Site goes through a plaza.
Page 25, Photo Lower Left: Cannot tell where Class II bikeways are.	Label changed to included “green”.
Page 34: Do fold down include retractable to allow maintenance vehicles through? Photo: Remove “Austin Texas”	Text changed.
Page 34, Photo: Remove “Austin Texas”	Locations of photos outside of Bay Area removed.
Page 37: Permeable gravel?”	Removed the word “permeable”.
Page 38, Figure 5-6: At first thought, the green shape was indicating landscaping not different scenarios, Confusing. Second from left: separated by use or direction?	Graphic changed.

COMMENT	RESPONSE
Page 41: Bottom paragraph left column needs rewording for clarity.	Text changed.
Page 41: Cast iron utility covers?	<u>Response:</u> Discussed at Bay Trail Steering Committee meeting and determined to leave in.
Page 41, Other Applications, Third bullet: On interpretive signs and brochures. Photo is blurry and does not show BT logo clearly.	Photo being reviewed for better example.
Page 44, Street Crossings: midblock? Generally do not want to encourage.	<u>Response:</u> Understand but there are many locations where the Bay Trail crosses streets not at intersections. We need to provide a solution for instances where midblock crossings are unavoidable.
Page 46, Photo: Maybe this matrix explanation approach instead of leader line messages.	<u>Response:</u> In consultation with Bay Trail staff, it was determined that the combination of matrices and use of leader lines are effective in conveying the intended design concepts.
Page 49, Elevation, third bullet: If boats can go under would that no qualify it as a bridge?.	Text changed to just say “underneath”.
Page 49, Graphics: 2050? Diagrams show both 2050 and 2100. Using Breuner Marsh example, it is only designed to 2050, some sections will be viable to 2100. The purpose is to encourage designers to think long-term.	<u>Response:</u> Discussed at Bay Trail Steering Committee meeting and graphics will remain the same.
Page 52, Trail Structure, first bullet: Concrete is hard on feet and joints. Can create bumpy surface for bikes.	<u>Response:</u> Concrete needs to be considered an option since it provides a low maintenance and long-lasting option when done correctly.
Page 52, Drainage, Third bullet: Permeable paving not necessarily accepted by Agencies and has a shorter life cycle.	Text changed to “permeable paving systems where allowable.”
Page 55, Drinking Fountains: 2-mile intervals? Unrealistic most places.	<u>Response:</u> Bay Trail staff intended these intervals to be aspirational while realizing that it may not ultimately be possible in some circumstances.
Page 55, Restrooms: 1-mile intervals? Unrealistic most places.	<u>Response:</u> Change to 2-mile intervals to be consistent with drinking fountains.
Page 56: EBRPD is moving toward security cameras at a staging areas..	<u>Response:</u> Text already includes security cameras.
Page 56, Middle graphic: There are not many types of trees that will grow along the Bay.	<u>Response:</u> The BCDC guidelines for shoreline plants include trees.
Page 56, photo credit: “Portland” typo.	Name removed.

BAY TRAIL STEERING COMMITTEE MEETING

COMMENT	RESPONSE
General: Change ‘cycle track’ to ‘separated bikeway’ While both terms are referenced in “ Caltrans Design Information Bulletin (DIB) 89 - Class IV Bikeway Guidance ,” the term “separated bikeway” has been preferred by many stakeholders and practitioners in California. (Sergio Ruiz)	Change made. Reference added in Appendix.
Page 3: Recommend that we mention the role of the Bay	Text changed to include “education”

COMMENT	RESPONSE
Trail Project as an educator, and acknowledge that there are conflicts between wildlife and public access. Working to offset slightly compromised habitat and slightly compromised trail in some places. Add to page 3 under natural resources. (Woodbury)	
Recommends that regarding future sea levels, not limit discussion to vertical issues, but emphasize that horizontal movement of the Bay Trail can occur over the long term. The Bay Trail may include multiple alignments in some areas. (Wenger)	<u>Response:</u> Page 19 states “Where possible, dedicating a linear public access corridor for the Bay Trail with sufficient width to allow the trail in the future to migrate to higher elevations should sea level rise threaten the trail.” Requiring multiple alignments is felt by Bay Trail Staff to be too ambitious.
Suggest a matrix summarizing toolkit. In the City of Richmond, the alignment has been set by the City’s Design Review Board, Planning Commission and City Council. BCDC typically reviews the Bay Trail alignment after the city’s approval. Therefore, a key part of this document will be the toolkit and decision-makers will use this part of the report. They want to know the bottom line requirements of width, clearances, etc. Recommends a table that highlights all the key design parameters, i.e. pavement width. It is not reasonable to expect them to read through entire document. (Beyaert)	<u>Response:</u> There are too many design variables to put clearly into one succinct table where the philosophy being presented is that design should be thought of comprehensively. If such a table were developed, people would likely only look at the table without reading the rest of the guidelines and use the numbers in the table as the bare minimum necessary to construct the Bay Trail, which defeats the purpose of the Guidelines. Perhaps a table/matrix could be developed as a separate document that is a “Guide to the Guidelines”.
Page 15: Regarding universal access, there is a difference between urban and rural environments. Most places can be made ADA compliant, but some places where cannot, and in some places it is questionable, i.e. along the American Canyon landfill loop, the gravel does not comply with ADA, yet the trail has been opened. Does the report essentially preclude this type of project from even opening? (Woodbury)	Text changed to read that the Bay Trail should be designed to be useable “by as many people as possible”. Also “to the maximum feasible extent” has been added as a qualifier. <u>Response:</u> ADA is the law. Bay Trail staff often relies on the local jurisdiction to apply the required ADA standards. Please note that accessibility standards do include “exceptions”. As with Chapter 1000 of the HDM, it is the intent of these Guidelines to only reference accessibility requirements.
Rural trails may not comply with urban guidelines. Can we include a caveat? Refuges and non-urban experiences need to be included. Levee trails won’t be paved because it is not the experience people are looking for. (Bondurant)	Text added “from urban to rural” in the introduction to Chapter 4.
Page 32, Bollards: <ul style="list-style-type: none"> • The Ideal is to not have bollards. But they are needed in some places. Must include yellow diamond stripes and reflective striping on the bollard. (Bondurant) • The potential safety of bollard installation outweighs the need to put a bollard in after the fact. (Huo) • Don’t mention flexible bollards because they give a false 	Text has been changed.

COMMENT	RESPONSE
sense of security. If needed, flexible bollards can be raised as an option at the staff level. (Woodbury)	
Page 36, Photo with centerlines: Delete photo on page 36 in Pt. Richmond. (Beyaert)	<u>Response:</u> Left in place after consideration. The image shows how the trail may interact with local streets. Sometimes local jurisdictions make the decision that the trail user should stop.
Page 37: In the section on Mandatory Design <i>Safety</i> Standards (page 37), I recommend removing the term “safety” when describing mandatory design standards. For one, it is not a term used in the Highway Design Manual in this manner. Also, it may imply that nonconformance to these standards would result in unsafe conditions, which is not necessarily true if mitigated. (Sergio Ruiz)	Word “Safety” removed.
Page 37: Without drawing out this section too much, consider including language on design flexibility, how a “one size fits all” approach in applying standards may not always be appropriate. If you’d like to reference Caltrans’ guidance on design flexibility, please see our <u>Flexibility in Multimodal Design Memorandum</u> . (Sergio Ruiz)	<u>Response:</u> The text does not include any “standards” and is specifically a “guideline” document. By definition “guidelines” are flexible.
Page 44, Section 5.4 - Integration Into the Local Street System, consider listing Protected Intersections as a potential tool when transitioning from one facility to another or at intersection. (Sergio Ruiz)	Added “protected intersections” to text.
Page 56, Security/privacy: The goal is to minimize graffiti through design, i.e. vegetation vs. blank walls. (Woodbury)	Text added to include anti-graffiti objective.
Appendix A, “Caltrans DIB 89 – Class IV Bikeway Guidance” be included in the list of references. (Sergio Ruiz)	Reference added.

GRETCHEN LAUSTSEN, MROSD

COMMENT	RESPONSE
<p>Often the Bay Trail provides access to sites with significant habitat for a variety of plant and animal species. The potential impacts of lighting and 24 hour access on these natural resources should be evaluated carefully on an individual project basis, based on the specific setting and habitats.</p> <p>Given the District's mission, we respectfully request that the objectives clarify that the guidelines for these improvements or uses are intended to be flexible and may not be appropriate in all settings. We suggest this point be highlighted earlier in the Design Principles and Objectives Chapter of the Bay Trail Design Guidelines and Toolkit document.</p> <p>Objective 3.1: User Experience and Safety: Objective 7: Providing safety and security lighting to accommodate 24 hours a day, 7 days a week access. May not be appropriate for Bay Trail.</p> <p>Objective 3.3: Universal Access: Objective 4:</p>	References to lighting have been changed throughout on pages 13, 15, 18 (with reference to habitat),

COMMENT	RESPONSE
<p>Recognizing the role of the Bay Trail as a commuter route that can be used all the time and that may benefit from specialized signs and lighting. May not be appropriate for Bay Trail.</p> <p>Objective 3.6: Compatibility with Wildlife: Objective 5: Directing trail lighting away from habitat areas. May not be appropriate for Bay Trail.</p>	

SAN FRANCISCO BAY TRAIL

DESIGN GUIDELINES
AND TOOLKIT

ASSOCIATION OF BAY AREA GOVERNMENTS





SAN FRANCISCO BAY TRAIL DESIGN GUIDELINES AND TOOLKIT

ASSOCIATION OF BAY AREA GOVERNMENTS

March, 2016

PREPARED BY:

2M Associates

PlaceWorks

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FUNDED BY:

California Coastal Conservancy

ACKNOWLEDGEMENTS

BAY TRAIL BOARD OF DIRECTORS

A 28-member board that governs the Bay Trail. The Board of Directors represents a broad range of public agency, non-governmental organizations, and private interests.

A smaller steering committee of the Board addresses program, planning, design, use, and management issues particular to the Bay Trail.

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CONTENTS

1. INTRODUCTION	1
WHAT IS THE SAN FRANCISCO BAY TRAIL?	2
WHY IS THERE A SAN FRANCISCO BAY TRAIL?	3
BAY TRAIL FACTS	3
PURPOSE OF THESE DESIGN GUIDELINES AND TOOLKIT	4
WHO WILL USE THESE GUIDELINES AND TOOLKIT?	4
HOW TO USE THESE GUIDELINES AND TOOLKIT	5
2. DESIGN APPROACH	7
UNDERSTAND WHO USES THE BAY TRAIL	8
UNDERSTAND BAY TRAIL USE DYNAMICS	9
DESIGN COMPREHENSIVELY	10
3. DESIGN PRINCIPLES AND OBJECTIVES	11
USER EXPERIENCE AND SAFETY	13
CONTINUITY AND CONNECTIVITY	14
UNIVERSAL ACCESS	15
PROXIMITY TO THE BAY	16
EXPECTED LEVELS OF USE	17
COMPATIBILITY WITH WILDLIFE	18
SEA LEVEL RISE	19
4. A GALLERY OF SETTINGS	21
GENERAL LOCALE	22
SPECIFIC CONDITIONS	24

5. TOOLKIT	29
SELECTED TERMINOLOGY USED IN THE TOOLKIT	30
THE ESSENTIAL BAY TRAIL	31
BAY TRAIL IN SPECIAL CIRCUMSTANCES	38
WAYFINDING AND THE BAY TRAIL LOGO	41
INTEGRATION INTO THE LOCAL STREET SYSTEM	44
RAIL AND LIGHT-RAIL LINES	47
OVER OR UNDER	48
SEA LEVEL RISE	49
WILDLIFE COMPATIBILITY	50
SUSTAINABILITY	52
TRAIL AMENITIES	54
SECURITY, VANDALISM, AND PRIVACY	56

APPENDIX

ADDITIONAL STANDARDS AND GUIDELINES APPLICABLE TO THE BAY TRAIL



Introduction

These guidelines offer direction and define goals to facilitate the design and development of a San Francisco Bay Trail system that is safe, connected and continuous; provides a positive user experience that encourages people to use the trail; and maximizes access to and use by the broadest spectrum of people possible. The guidelines are general in scope due to the varied conditions through which the San Francisco Bay Trail passes and the variety of users and types of uses that occur along the trail. They are applicable to all development of the San Francisco Bay Trail and are intended to complement national, state, and local design standards and guidelines. Different segments of the San Francisco Bay Trail will likely need to address different site opportunities and constraints.

Background: Berkeley

WHAT IS THE SAN FRANCISCO BAY TRAIL?

San Francisco Bay, one of the largest estuaries in North America, influences and enhances the natural, aesthetic, and economic vitality of the entire Bay region, much to the benefit of millions of residents and visitors. The San Francisco Bay is the dominant open space amenity of the Bay Area.

When completed, the San Francisco Bay Trail (the Bay Trail) will be a 500-mile green transportation and recreation route for walking and cycling around the entire San Francisco Bay. The Bay Trail will run through all nine Bay Area counties, 47 cities, and across seven toll bridges. As a long-distance trail, the Bay Trail links people and communities with each other, links people with their environment, and links people with their own sense of well-being and health. Because the Bay Trail leads to and runs along the shoreline of the Bay, it also provides access for fishing, picnicking, windsurfing, boating, nature education, and other waterfront activities.



WHY IS THERE A SAN FRANCISCO BAY TRAIL?

Legislative History

Senate Bill 100, authored by former State Senator Bill Lockyer and passed into law in 1987, created the vision of the Bay Trail and directed the Association of Bay Area Governments (ABAG) to develop a plan for a “ring around the Bay”. The Bay Trail Plan, adopted by ABAG in July 1989, includes a proposed alignment, a set of policies to guide the future selection and implementation of routes, and strategies for implementation and financing. Since its inception, the Bay Trail Plan has enjoyed widespread support. The majority of counties and cities through which the Bay Trail passes have included the Bay Trail in General Plans, specific plans, bicycle plans, and/or pedestrian plans.



Needs and Public Benefits

The importance of the Bay Trail to the quality of life for millions of Bay Area residents and visitors cannot be overstated. The San Francisco Bay Trail is a one-of-a-kind signature amenity for the Bay Area. At over 500 miles in length the completed Bay Trail and the benefits it provides will be unparalleled in the nation. Public benefits of the Bay Trail include:

- **Transportation:** As a transportation facility, the Bay Trail serves as an important commute alternative for cyclists and pedestrians, and connects to numerous public transportation features, including ferry terminals, airports, light-rail lines, bus stops, Caltrain, Amtrak, and BART.
- **Recreation:** The Bay Trail provides scenic recreation for a wide variety of users including hikers, joggers, bicyclists, skaters and wheelchair users, among others.
- **Health:** The Bay Trail facilitates physical activity through settings that provide multiple benefits for the body and mind.
- **Natural Resources:** Following the Bay’s shoreline, the Bay Trail allows the public to discover, experience and appreciate the Bay’s waters and wildlife. The Bay Trail fosters education and public support for Bay resource protection, including habitat acquisition and restoration.

- **Connections:** The Bay Trail offers access to commercial, industrial and residential neighborhoods; points of historic, natural and cultural interest; and recreational areas like beaches, marinas, fishing piers, and boat launches. The Bay Trail connects over 130 parks and wildlife areas totaling over 57,000 acres of open space. It links highly urbanized areas like downtown San Francisco to remote natural areas like the Don Edwards San Francisco Bay National Wildlife Refuge.
- **Tourism:** The Bay Trail is a scenic route that visitors from throughout the world use to experience the Bay.

BAY TRAIL FACTS

- Over 2.7 million people, nearly 40% of the local population, live within 2 miles of the Bay Trail.
- There are now 1.6 million jobs within the same 2-mile area, accounting for over 50% of all the jobs in the Bay Area.
- The completed Bay Trail will be accessible to over 7,000,000 people living in the Bay Area in 2015 and over 9,250,000 projected to live in the area by 2040.



Richmond Marina
Source: Flickr (San Francisco Bay Trail Project)

PURPOSE OF THESE DESIGN GUIDELINES AND TOOLKIT

The purpose of these guidelines and toolkit is to provide the San Francisco Bay region with a design resource applicable to any project that includes the San Francisco Bay Trail. These guidelines provide goals and direction for site planning and trail design to facilitate achievement of the Bay Trail vision. These guidelines establish a set of design principles aimed at developing and managing the San Francisco Bay Trail while providing for the protection of Bay resources, regional livability, and local economic prosperity.

These Guidelines and Toolkit reflect a Bay Trail that:

- is intended to be a system of shoreline multi-use paths separated from vehicular traffic.
- consists of a shoreline, off-street, multi-use trail, or in some cases where a trail may not be achievable, either dedicated bicycle lanes or separated bikeways with complementary pedestrian walkways and promenades.
- is to be sustainable over time, reflect current safety standards, accommodate future use levels when the entire Bay Trail system is completed, and recognize changing needs and environmental conditions such as sea level rise.

These guidelines and tools should not constrain inspiration when an opportunity exists for a trail design that is visionary.

WHO WILL USE THESE GUIDELINES AND TOOLKIT?

The Bay Trail Design Guidelines and Toolkit have been developed for use by:

- **Design Team** – Developers, land planners, landscape architects, engineers, architects and other members of professional teams designing projects along the shoreline with access to and along it.
- **Public Agencies** – Cities, counties, special districts, and regional, state, and federal agencies involved in resource protection, land use planning, and the development of transportation and recreation trail facilities.
- **San Francisco Bay Conservation and Development Commission** – Staff, Design Review Board members, and Commission members when considering the siting and design of shoreline public access proposals.
- **The Public** – Community groups and individuals where understanding the goals of the Bay Trail and ways it may be implemented will facilitate completion of the trail system and upgrading trail facilities over time.

HOW TO USE THESE GUIDELINES AND TOOLKIT

The Design Guidelines are broad statements about trail dynamics that should be considered in designing any segment of the Bay Trail. The Toolkit presents design scenarios for the Bay Trail and general performance specifications.

The four-step process below should help everyone plan, design, and evaluate the Bay Trail for its effectiveness in creating a valuable multi-use trail.

1. Comprehend the **Design Approach** considerations outlined in Chapter 2.
2. Meet the **Design Principles and Objectives** found in Chapter 3.
3. Understand the variety of settings and context for the Bay Trail as characterized in Chapter 4: **A Gallery of Settings**.
4. Refer to The **Design Toolkit** in Chapter 5 and develop a Bay Trail design that reflects the setting within which it occurs while meeting the Bay Trail Design Principles and Objectives.

THE BAY TRAIL, PUBLIC ACCESS, AND THE SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

The San Francisco Bay Conservation and Development Commission (BCDC) was created by the California Legislature in 1965 under the McAteer-Petris Act in response to broad public concern over the future of the San Francisco Bay. The Commission is charged with, among other activities, regulating new development within 100 feet of the Bay shoreline to ensure that maximum feasible public access to the Bay is provided. As defined by the Commission's *San Francisco Bay Plan*, "public access" includes physical public access to and along the shoreline of the Bay and visual public access (views) to the Bay from other public spaces. In most cases, this public access involves accommodating the San Francisco Bay Trail.

The BCDC publication *Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay* provides general guidance about the design variables that the Commission addresses in conducting its design review of permit applications, including reference to the Bay Trail. The Bay Trail Design Guidelines and Toolkit are intended to be complementary to those of BCDC relating to shoreline access.

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Design Approach

Background: Emeryville | Source: BCDC



UNDERSTAND WHO USES THE BAY TRAIL

The Bay Trail, simply defined, accommodates pedestrian, bicycle and other non-motorized forms of movement. However, Bay Trail users cannot be easily characterized as simply bicyclists or pedestrians. The goal of the Bay Trail is to accommodate and provide access to the largest spectrum of non-motorized users possible.

Bay Trail users can be:

- any age with any level of physical, auidal, and visual ability.
- solo travelers, small groups that might be traveling side-by-side, or part of a bicycle club or large group led by a docent or teacher.
- on individual bicycles, tandem bicycles, bicycles with trailers, or tricycles.
- using skateboards, rollerblades, or non-motorized scooters.
- carrying nothing or carrying picnic baskets, coolers, fishing equipment, surf and windsailing equipment, or kayaks.
- pushing strollers or pulling wagons with children in them.
- walking, running, or bicycling with one or more dogs.

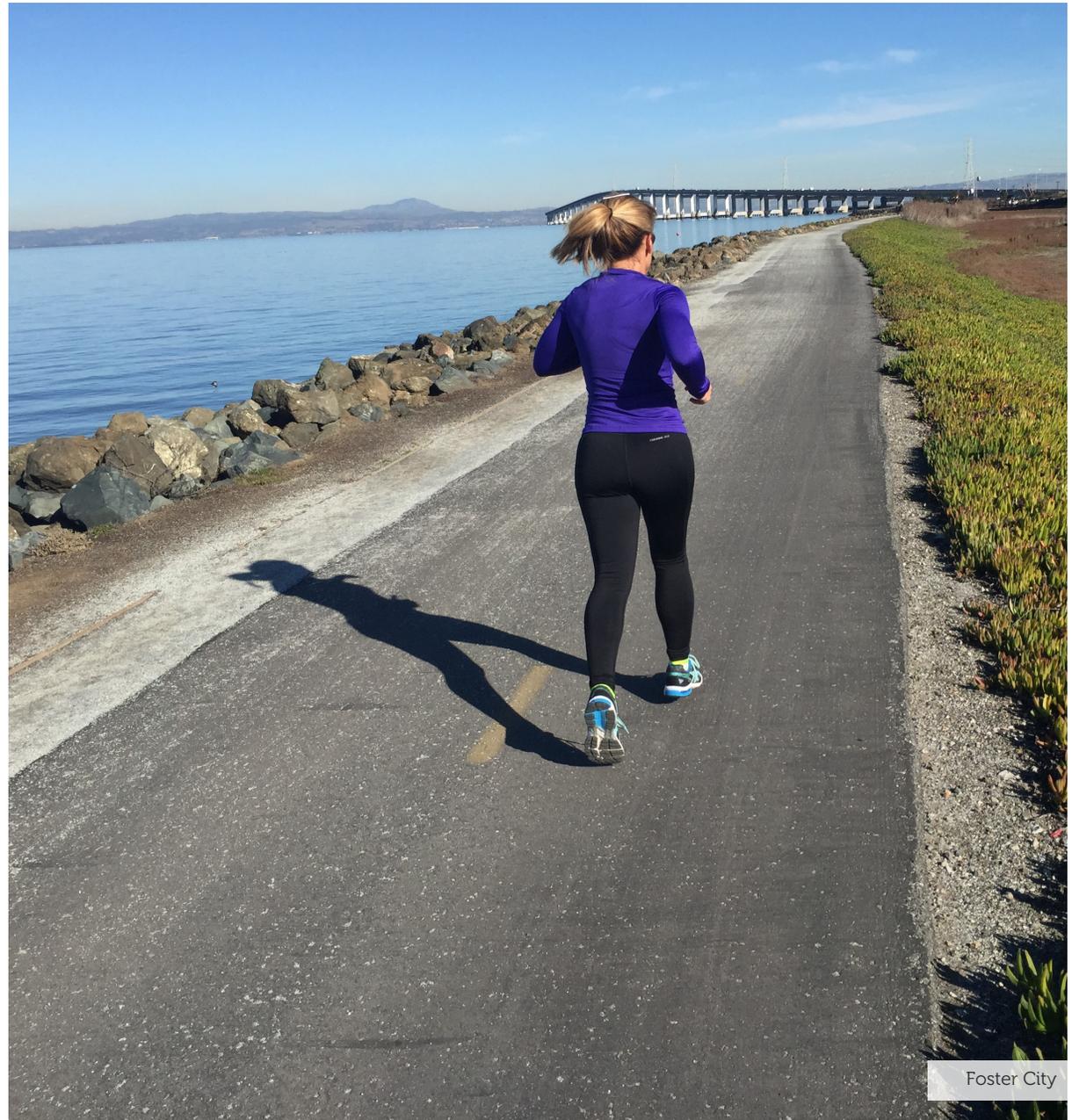
1. Hamilton Wetlands Preserve
Source: SF Bay Trail Project
2. Hamilton Wetlands Preserve
Source: Pamela via marinmommies.com
3. Mission Bay, San Francisco
4. Berkeley Marina
5. Oakland | Source: Flickr (Robert Prinz)
6. Richmond | Source: Flickr (SF Bay Trail Project)
7. San Francisco
8. Palo Alto Bayland
Source: Flickr (SF Bay Trail Project)
9. Tiburon | Source:SF Bay Trail Project
10. Berkeley
11. Crissy Field | Source: Presidio Trust
12. Foster City

UNDERSTAND BAY TRAIL USE DYNAMICS

Bay Trail users can be:

- moving quickly such as when commuting to work on a bicycle.
- not moving at all to take in views of the Bay and the activities occurring on it.
- moving along at any speed in between.

Because of this varied use, the paramount design consideration related to the Bay Trail is understanding the dynamics of shared-use and user safety. The most significant design challenge is that trail use cannot be easily categorized. A chief Bay Trail design goal is to provide sufficient future capacity, width, line of sight, and in some cases delineating the trail corridor to accommodate this variety of use and help minimize conflicts among uses. A critical concept in design of the Bay Trail is consideration of its use level when the entire Bay Trail system is completed and linked to nearby communities.



Foster City



DESIGN COMPREHENSIVELY

Design implies intent, and each segment of the Bay Trail involves a wide range of opportunities and constraints requiring careful investigation and thoughtful design decisions.

Sometimes trail design choices are clear and straightforward, as when a perennial stream must be crossed and a bridge is needed. Sometimes the choices are more complex. Key design considerations include:

- **Collaboration:** Designing the Bay Trail should not be done in a vacuum. There are numerous local and regional agencies whose individual policies and standards about the Bay Trail and its setting need to be considered. These will vary from trail segment to trail segment. Communication among involved professionals is paramount to a successful design that can be both permitted and constructed.
- **Width and Sight Lines:** With some exceptions, the Bay Trail rarely travels in a straight line. It turns because of topography, to avoid obstacles, or to capture important views of the Bay. The Bay Trail travels up and down slopes, over and under roads, railroads, and streams, and follows the contours of the Bay itself. The Bay Trail corridor, i.e., the right-of-way around the actual trail, should be planned and designed to be wide enough

to accommodate the expected future level of use when the Bay Trail system is fully completed.

- **Surface:** The Bay Trail surface will typically be paved but may also include non-paved jogging shoulders. In limited cases, such as in areas of sensitive habitat or on levees with particular maintenance conditions, the entire trail tread may be composed of stabilized natural materials. See also Sections 5.1 and 5.2.
- **Water Quality:** To protect the Bay, storm water runoff from the trail should be managed with sheet drainage directed to a system of water quality control features or through use of permeable paving materials.
- **Constrained Right-of-Way:** On occasion, the planning and design of the Bay Trail involves adapting to existing physical conditions. In these instances, creative solutions are required such as reducing the width of adjacent road travel lanes, eliminating trail shoulders, or adding signage or other safety measures.



Design Principles and Objectives

Background: Berkeley



Benicia State Recreation Area

In designing the Bay Trail, there are seven essential principles that should be considered and addressed for any trail segment. These principles include:

- 3.1** User Experience and Safety
- 3.2** Continuity and Connectivity
- 3.3** Universal Access
- 3.4** Proximity to the Bay
- 3.5** Expected Levels of Use
- 3.6** Compatibility with Wildlife
- 3.7** Sea Level Rise

The following sections elaborate on the above principles and provide design objectives for each.

3.1 USER EXPERIENCE AND SAFETY

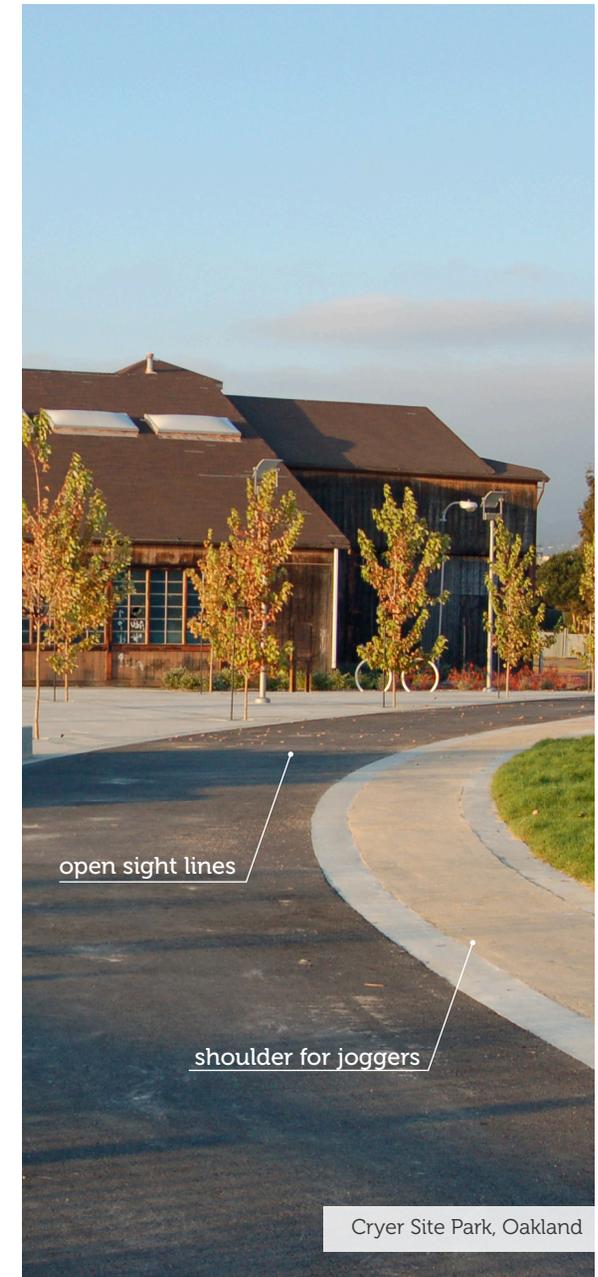
MAKE THE BAY TRAIL ENJOYABLE AND SAFE FOR ALL

Safety will always be the prime directive of Bay Trail design. A well-designed trail is a safe trail that minimizes conflicts between trail users and other nearby activities. At the same time a well-designed trail encourages use, improves the user experience, and reduces the managing agency's liabilities.

OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Developing a complete trail around the Bay that is separate from motor vehicles.
- Providing an adequate buffer to create a safe and positive user experience that considers design elements of sights, sounds and fresh air.
- Designing a trail wide enough to accommodate expected future levels and types of use, and to provide adequate capacity in order to minimize conflicts between trail users.
- Developing the Bay Trail with open sight lines so that existing and future users can more easily avoid obstructions and also for personal safety.

- Specifying trail and shoulder surfaces that accommodate different users such as bicyclists and joggers.
- Avoiding constraining trail conditions such as being enclosed by fences or other vertical features that reduce the functional width of the trail.
- Providing safety and security lighting to facilitate 24 hours a day, 7 days a week access where appropriate.
- Providing essential public amenities such as benches, drinking fountains, bike repair stations, and restrooms that encourage and support long-distance travel.
- Providing clear and visible wayfinding and distance signage at all decision-making points to identify the Bay Trail and at regular intervals as needed when the Bay Trail is located on-street.





3.2 CONTINUITY AND CONNECTIVITY

ASSURE A CONTINUOUS LINEAR EXPERIENCE

Continuity

The Bay Trail is about continuous linear travel. The Bay Trail will be fully functional when it provides a continuous loop around the Bay and connects all 9 counties of the Bay Area and the 47 cities that front the Bay. From a functional standpoint, the Bay Trail design must consider all the dynamics involved with two-way circulation for bicyclists and pedestrians including continuity of travel, lines of sight, turning movements, user interactions, traffic signs and signalization, and physical obstructions.

Connectivity

Direct pedestrian and bicycle connections with adjacent cities, activity centers, park and recreation areas, and public transit facilities, including BART, light rail, and ferry service, will exponentially increase Bay Trail use by the general public.

OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Incorporating the Bay Trail into all shoreline projects and providing clear, continuous and seamless transitions to adjacent segments of the Bay Trail and local and regional trail systems.

- Working with property owners and local jurisdictions to provide clear transitions to the Bay Trail from other pedestrian and bicycle facilities.
- Providing clear transitions when bicycle and pedestrian facilities shift between Class I multi-use pathways, Class II bicycle lanes, Class IV separated bikeways, and sidewalks.
- Connecting the Bay Trail to all transit sources within walking and bicycling distance, such as water taxis, ferries, buses and rail systems.
- Connecting the Bay Trail with schools, civic areas and government offices, commercial districts, businesses, and other activity centers in adjacent cities.
- Coordinating Bay Trail staging areas and access points with regional parks and open spaces and local municipal parks.
- Providing clear wayfinding signs at all decision points.
- Coordinating with transit agencies to include amenities such as bike stations, bike racks, and real-time applications that encourage use.

3.3 UNIVERSAL ACCESS

ACCOMMODATE ALL USER GROUPS

The Bay Trail in its entirety, including all associated trail features, should be designed to be usable by as many people as possible including all the user types described in Chapter 2.

OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Incorporating accessibility into the design of the Bay Trail and all related trail amenities, to the maximum feasible extent. For additional information, refer to the *U.S. Access Board's Design Guidelines* (www.access-board.gov), the California Building Code, and local regulations on accessibility.
- Designing the trail for all forms of non-motorized use.
- Ensuring the trail design width accommodates bi-directional bicycle and pedestrian use for the expected level of future use when the Bay Trail is completed.
- Recognizing the role of the Bay Trail as a commuter route that may benefit from specialized signs and lighting.





overlook platforms provide opportunities to safely view wildlife and the water

San Mateo

3.4 PROXIMITY TO THE BAY

PROVIDE ACCESS TO THE BAY AND ITS SHORELINE

Access is both physical and visual. Development of the Bay Trail should take maximum advantage of opportunities to see the Bay and use its waters for a variety of recreational and educational activities.

OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Locating the trail as close to the shoreline as possible.
- Providing the public with opportunities to safely view:
 - ▶ Wildlife
 - ▶ All kinds of water-based recreation activities such as swimming, sail boating, wind surfing, kite-surfing, kayaking, and the like
 - ▶ Airplane comings and goings
 - ▶ Port activities
 - ▶ Bridges
 - ▶ City skylines, mountain peaks, and ridgelines
- Ensuring that the design affords views to the water and provides access to shoreline amenities, such as beaches, tidal stairs, ramps, and floating docks where possible.
- Encouraging designs where shoreline structures do not visually separate the Bay Trail from the Bay or opposite shores and landmarks, such as islands, bridges, city skylines and backdrop mountains.

3.5 EXPECTED LEVELS OF USE

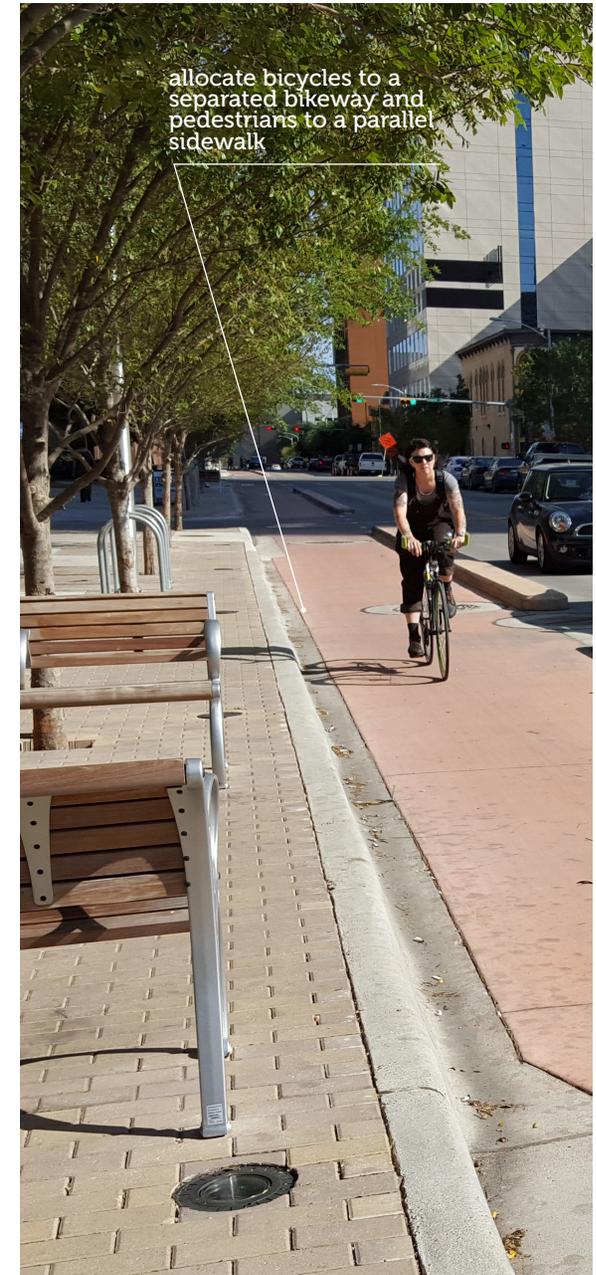
REFLECT FUTURE USE CONDITIONS

Since its inception, the Bay Trail has drawn a growing number of users each year. With every additional segment of the Bay Trail completed, and more direct connections from other bicycle and pedestrian systems being made, more connectivity is created and even more use occurs. The higher the user numbers and the greater the variety in users traveling at different speeds for different purposes, the more the need will increase for designs that expand the capacity and width of the Bay Trail. The trail must be designed to accommodate the growing population of the Bay Area and the expected increased use of the Bay Trail system. Once it is fully completed, the idea of embarking on a trip around the entire 500-mile loop will draw a significant number of people onto the Bay Trail.



OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Providing a wider trail where the anticipated volume of use is expected to be higher than typical.
- On wider trails, separating faster-moving wheeled use (bicycling, rollerblading, or skateboarding for example) from slower-moving pedestrian use employing one of the following options.
 - ▶ Indicating the separation by striping.
 - ▶ Visually distinguishing the pedestrian path from the bike path by using different pavement surface types/colors.
 - ▶ Providing two physically separate trails, one for bicycles and other faster-moving wheeled use and one for pedestrians.
 - ▶ Allocating bicycles to a separated bikeway within a road right-of-way while directing other users to a parallel promenade or sidewalk.



3.6 COMPATIBILITY WITH WILDLIFE

ENSURE THE BAY TRAIL IS COMPATIBLE WITH WILDLIFE THROUGH SITING AND DESIGN

In some locations, the Bay Trail's setting is composed of the Bay's open waters, tidal mudflats and wetlands, seasonal wetlands, and upland edges used by migratory waterfowl and resident wildlife species, some of which are threatened or endangered. The design of the Bay Trail and adjacent habitat conditions should complement each other through thoughtful trail siting and design to minimize or eliminate public access and

wildlife compatibility concerns. In some cases, the Bay Trail may be a benefit to habitat conditions by directing use away from random informal access that disrupts habitat.

OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Locating the Bay Trail and related use areas to avoid habitat fragmentation, vegetation trampling, and erosion.
- Employing appropriate design features within the Bay Trail corridor to minimize or eliminate adverse human and wildlife interactions. See also Section 5.8.
- Using durable materials to reduce erosion impacts on adjacent habitats. See also Section 5.9.
- Providing designated trails in desirable areas to deter users from creating informal access into and through sensitive locations.
- Directing trail lighting away from habitat areas and in areas where lighting would impact sensitive species, no lighting at all.
- Incorporating educational and interpretive elements about the value of habitat resources and related species.





3.7 SEA LEVEL RISE

ADDRESS SEA LEVEL RISE THROUGH TRAIL DESIGN

While scientific uncertainty remains regarding the pace and amount of future sea level rise, the Bay Trail design should use the most current regional sea level rise projections available.

OBJECTIVES TO ACCOMPLISH THIS PRINCIPLE:

- Siting the Bay Trail to:
 - ▶ Be elevated above expected extreme tides, storm surges, and flood levels.
 - ▶ Where needed, designed to tolerate occasional flooding.
- Where possible, dedicating a linear public access corridor for the Bay Trail with sufficient width to allow the trail in the future to migrate to higher elevations should sea level rise threaten the trail.
- Integrating the Bay Trail into the design of new protection structures and assuring that the top elevations are sufficiently wide to accommodate the Bay Trail.
- Involving knowledgeable geotechnical and civil engineering professionals in the design of the trail.
- Including adjacent structural (e.g., levees, seawalls) and non-structural erosion control measures (e.g., wetlands, vegetative buffers) to protect the Bay Trail from damage.

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A Gallery of Settings

A combination of diverse urban growth patterns and active resource stewardship actions in the San Francisco Bay Area over the last fifty years has created a wide diversity of settings, from urban to rural, through which the Bay Trail navigates. The design of the Bay Trail should respect and understand the spectrum of surroundings and the intended land uses through which it traverses.

Background: South San Francisco | Source: Corinne DeBra



landscaped buffer for privacy

Near Park Street Bridge, Oakland | Source: Flickr (SF Bay Trail Project)

GENERAL LOCALE

Urban Land Use Fabric

Located within the highly urbanized Bay Area, the Bay Trail often passes by, and sometimes through, urban residential, office, retail, hotel, and industrial land uses. For most of these settings, connecting to the Bay Trail is desirable as the trail is both a recreation and commute amenity for residents and workers alike. At the same time, design solutions need to address privacy and security concerns that may exist.

Urban Parklands

The Bay Trail is used to access the many national, state, regional, county, and city parks and recreation areas that front the Bay. These range in scale from thousand-acre urban parklands to parks less than one acre. These lands provide opportunities for both active and passive recreation.



opportunities for passive recreation

1,300-acre Presidio, San Francisco | Source: Presidio Trust



0.8-acre Cryer Site Park, Oakland

Secure Land Uses

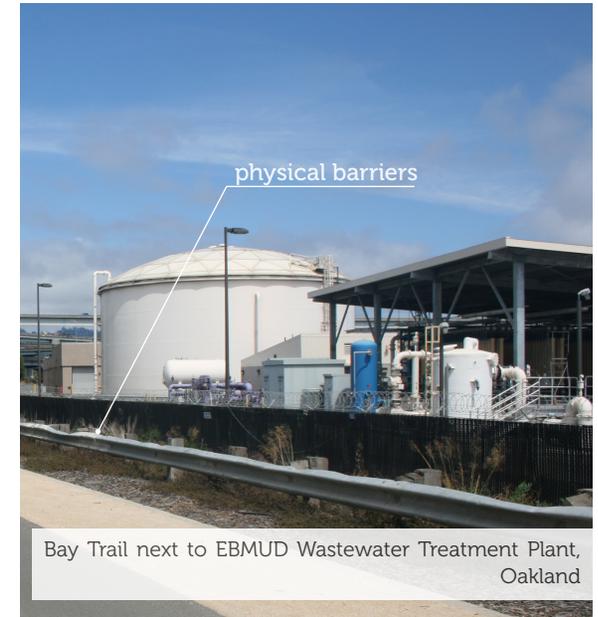
There are many land uses along the margins of the Bay that fall directly under the policies of the Department of Homeland Security or warrant extraordinary security considerations. These include military bases, ports, airports, highways, refineries, and energy production facilities among others. There may be design requirements for the Bay Trail such as setbacks and physical buffers, fencing, and user information to consider.

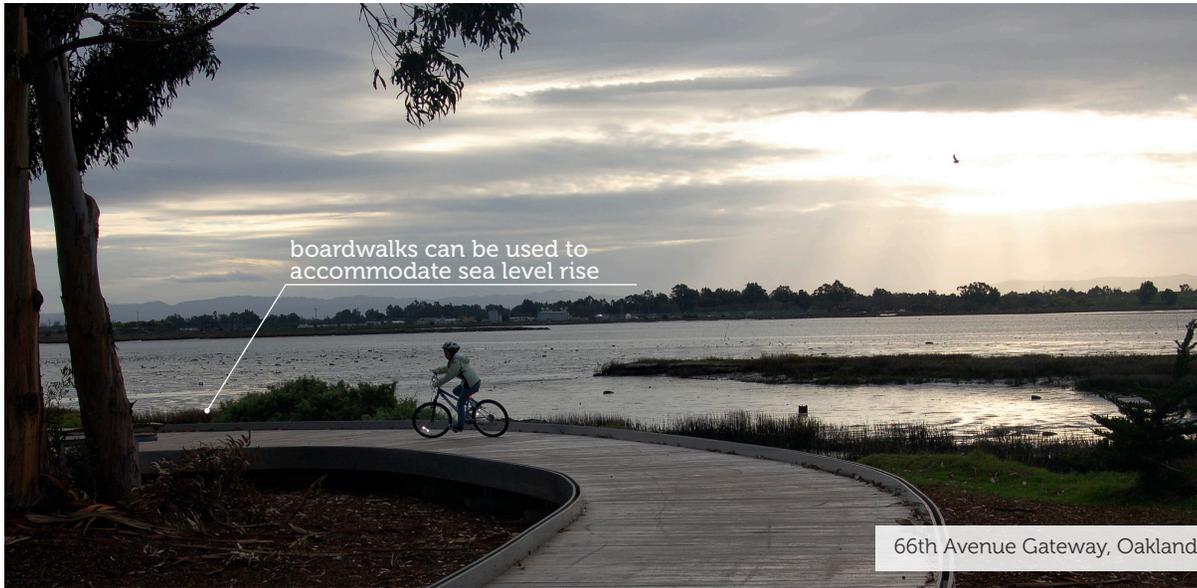
Rural and Agricultural Lands

The Bay's margins include privately held farms and ranchlands used for a variety of purposes. These include rural residential developments, grazing lands, and active agriculture such as vineyards or grain production. These land uses may necessitate that the Bay Trail design includes specific privacy and security measures.

Wildlife Habitats

The open space system of the Bay Area provides for passive recreation in a variety of natural, relatively undeveloped settings rich in habitat resources. Access provided by the Bay Trail and conservation of wildlife habitat are both important concepts that support each other. Wildlife and its varied habitats attract Bay Trail users, enhance the outdoor human experience, and in turn build public support and interest in protecting wild areas and funding restoration projects. The design of the Bay Trail and adjacent habitat areas should complement each other.





boardwalks can be used to accommodate sea level rise

66th Avenue Gateway, Oakland

SPECIFIC CONDITIONS

Levees and Boardwalks

Anticipating the advent of sea level rise is an important design scenario for the Bay Trail. Parts of the existing Bay Trail are built on levees around the margins of the Bay and the rivers and streams that drain into it. As new Bay Trail segments are designed or existing segments are redeveloped, there will be a need to raise the Bay Trail to a benchmark elevation that will accommodate sea level rise, such as through the use of levees or boardwalks.

Plazas

The Bay Trail may be part of civic, memorial or historic places. There may be a plaza that is part of the Bay Trail such as at intersections with connector trails where gathering places, wayfinding information, or other trail amenities are provided. Visually informing the trail user about congested areas and providing clear cues as to where the trail is located are necessary design considerations.



wayfinding information

Cryer Site Park, Oakland
Source: Flickr (San Francisco Bay Trail Project)



trail amenities, such as trash receptacles and lighting

Aquatic Park, Berkeley

Promenades

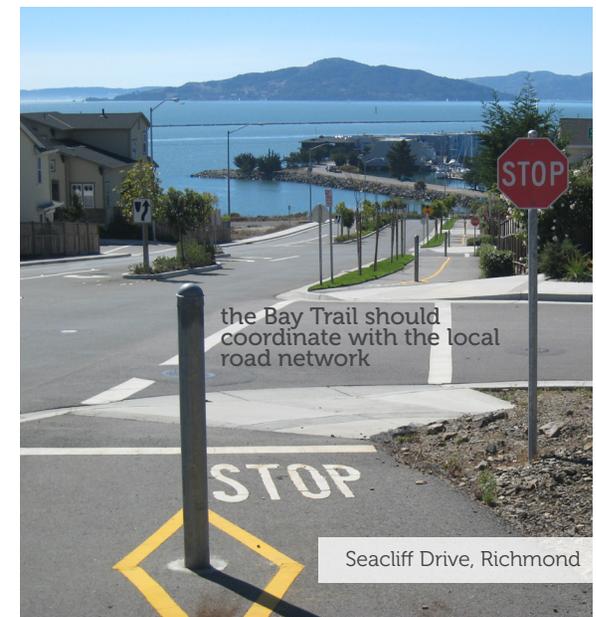
More and more cities around the Bay are developing linear promenades that promote civic functions and support the local economy. Land uses along promenades can range from office industrial parks to multi-use family and apartment complexes to shops and restaurants taking advantage of the Bay views. The Bay Trail user's speed will vary as some may want to sit and rest, some window-shop, some stop and talk, and some want to just be able to pass through easily and quietly.

Streets

There will be some urban segments along the Bay Trail route where a corridor for a shared-use trail cannot be created that is sufficiently wide to accommodate the anticipated volume of use without affecting existing development patterns. In these circumstances, either sidewalks with a Class IV separated bikeway or a designated Class II bicycle lane will be required to assure trail connectivity.

Street Intersections and Crossings

As one component of a comprehensive transportation system, the Bay Trail's circulation function needs to interact with local pedestrian and bicycle systems that connect with it and with the surrounding road network. At-grade connections and transitions present different design challenges that need to be coordinated using traffic control devices such as signs, crosswalks, flashing lights, or signalization depending on the circumstances.



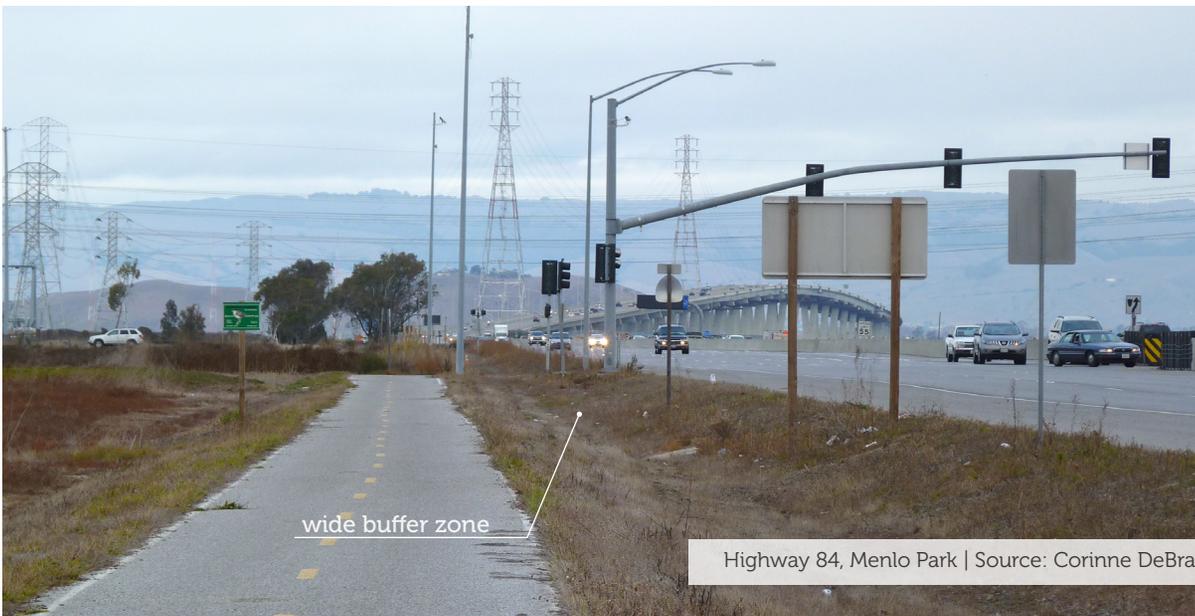


Highways

In some locations, the Bay Trail will be adjacent to freeways, highways, or major thoroughfares. Traffic safety for both motorized vehicles and trail users will be of foremost importance. Typically a barrier will be required. Line of sight, noise, visual distractions, air quality, personal and physical safety, and other issues will need to be investigated and resolved. This often involves analysis by a traffic engineer in consultation with Caltrans and/or the roadway owner.

Bridges and Undercrossings

There are many barriers to the Bay Trail that must be surmounted through design to have a continuous transportation facility and user experience. Often these are natural barriers like the Bay itself or the hundreds of creeks that flow into it. Sometimes they are freeways, major thoroughfares, or train or light-rail rights-of-way. The design choices are relatively straightforward, either to go over or under these facilities. Each has implications for accessibility, views, experience, capital cost, and operations.





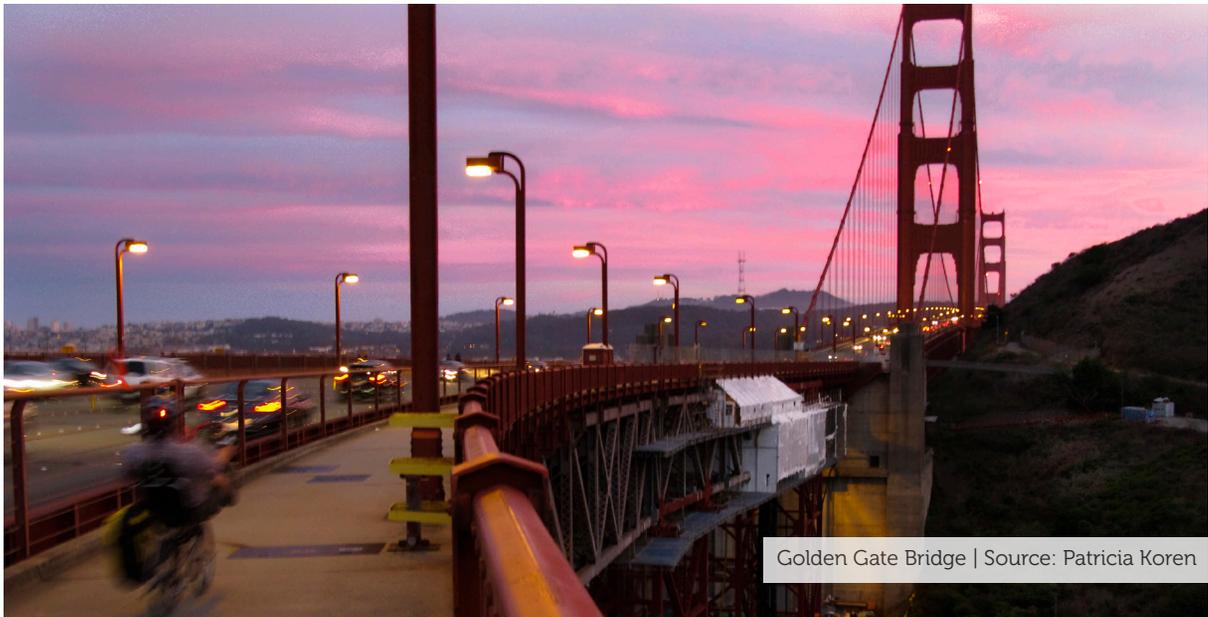
Bay Bridge
Source: Flickr (SF Bay Trail Project)



Heron's Head Park, San Francisco



San Mateo Shoreline Parks
Source: Flickr (Martin Taylor)



Golden Gate Bridge | Source: Patricia Koren

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Toolkit

The Bay Trail Toolkit (Toolkit) describes and illustrates design solutions that represent creative responses and best practices for use by government agencies and developers, as well as their qualified trail design professionals in planning, designing, and developing any Bay Trail segment. The Toolkit is intended as an aid in addressing common design issues that could exist along the Bay Trail. Although the Toolkit provides examples of design solutions, it is not meant to preclude creativity in design based on individual project site and contextual considerations or as exemplified in other agency or industry standards and guidelines.

The Toolkit is to be used in combination with the California Department of Transportation's standards and additional guidelines contained in the Highway Design Manual (HDM) for bikeways, as well as other national, state, regional and local municipality guidelines about shared-use trails. Appendix A includes a partial list of references for more information.

SELECTED TERMINOLOGY USED IN THE TOOLKIT

“**Shared-Use Trail**” is used to describe the Bay Trail where it provides a completely separated right-of-way for exclusive non-motorized use with cross-flow minimized to the extent possible. A shared-use trail is used by people of all shapes, sizes, ages, and abilities generally defined as either bicyclists or pedestrians. A shared-use trail is analogous to the terms “Class I Bikeway” and “Bike Path” used in the HDM and the term “Shared-Use Path” used by the American Association of State Highway Transportation Officials.

“**Trail**” refers to the paved and/or natural surface portion of the Bay Trail that defines the user’s travel space. In cases where the Bay Trail passes through heavily used areas such as urban plazas, striped pavement edge markings may define the trail.

“**Trail Shoulder**” refers to a clear level area immediately adjacent to the trail that provides a safety buffer for the trail bicyclist. The trail shoulder is often specifically designed for use by pedestrians for jogging or walking out of the path of bicycles and other higher-speed trail users.

“**Separated Bikeway**”, also referred to as a “Class IV” bicycle facility or “cycle track,” is an exclusive bicycle facility that mimics the experience of a bike path, but in a street environment. A cycle track is physically separated from motor traffic and distinct from a sidewalk used by pedestrians. Pedestrian facilities must be provided in conjunction with a separated bikeway to be considered a completed Bay Trail segment.

This section addresses the following topics:

-  5.1 The Essential Bay Trail
-  5.2 Bay Trail in Special Circumstances
-  5.3 Wayfinding and the Bay Trail Logo
-  5.4 Integration into the Local Street System
-  5.5 Rail and Light-Rail Lines
-  5.6 Over or Under
-  5.7 Sea Level Rise
-  5.8 Wildlife Compatibility
-  5.9 Sustainability
-  5.10 Trail Amenities
-  5.11 Security, Vandalism, and Privacy

5.1 THE ESSENTIAL BAY TRAIL

Trail Geometrics

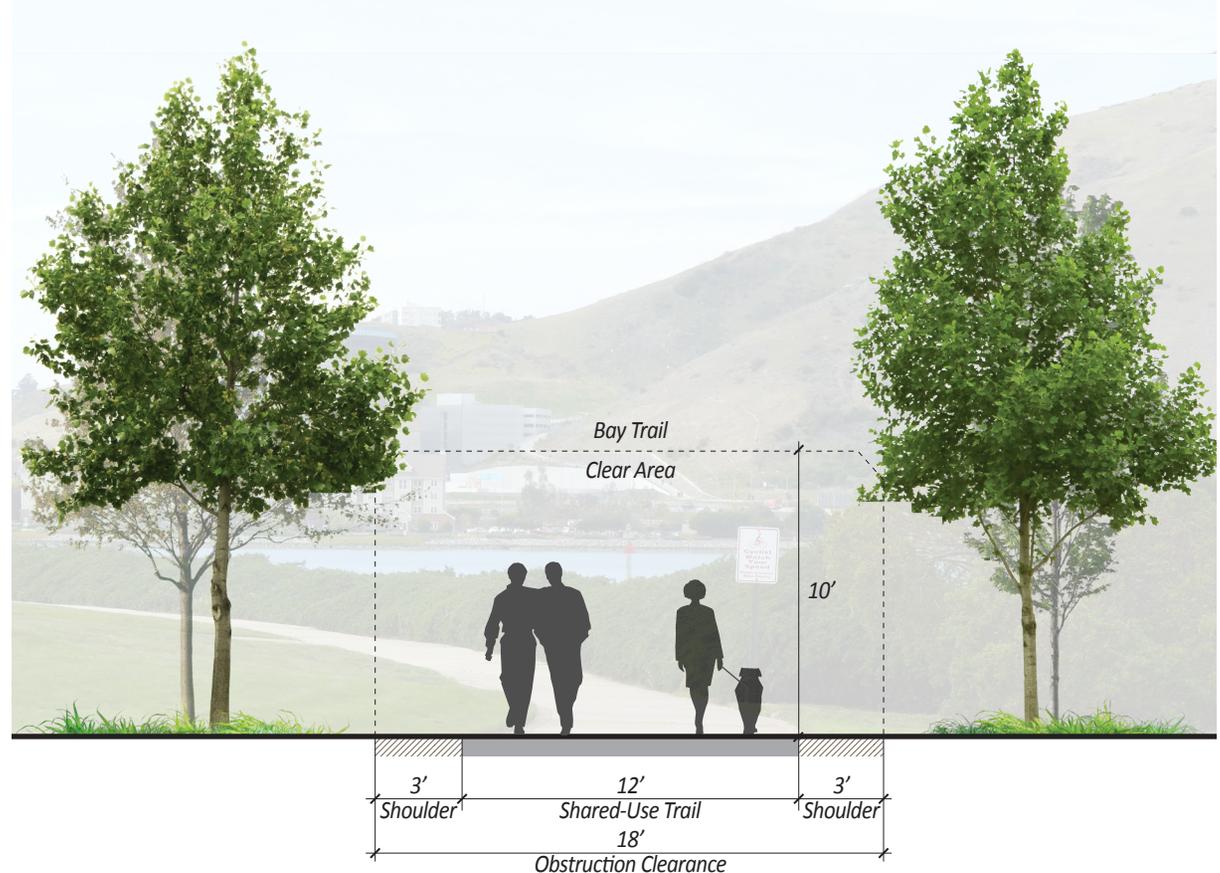
- **Trail Width:** The standard width of the Bay Trail is 12 feet whether paved or natural surface materials. An additional 3-foot shoulder free from obstructions should be provided on each side. The Bay Trail and its clear space should consist of a minimum 18-foot width. The trail and shoulder widths are considered minimum standards necessary to



accommodate a typical level of use along the Bay Trail when completed. In many instances, projected use levels may be high, and therefore Bay Trail width should be wider, such as along urban waterfront promenades. If use levels are anticipated to be extremely high, consideration should be given to separating fast-moving users (e.g., bicyclists,

rollerbladers, or skateboarders) from slower-moving pedestrians. There are a variety of methods to do so, such as pavement striping or inclusion of physical barriers (see Section 5.2. Bay Trail in Special Circumstances). In any case, all Bay Trail users should be able to enjoy a Bay experience, including Bay views.

FIGURE 5-1: BAY TRAIL WIDTH



- Horizontal Trail Alignment:** The Bay Trail is one of the most popular shared-use trails in the Bay Area. The horizontal alignment of the Bay Trail is defined in part by a bicycle design speed decided on a project-by-project basis. Low design speeds and trail traffic calming devices could be considered for 1) crowded areas, 2) locations where considerable cross-traffic is projected, and 3) locations with sharp horizontal curvatures where right-of-way widths are constrained.
- Alternative Surfaces:** In limited circumstances, natural materials that meet accessibility requirements may be appropriate. Depending on soil type and other site-specific conditions, the design could involve compacted gravel, decomposed granite, and/or native soil and may incorporate any number of stabilizing agents. Examples include a trail near sensitive habitats where paving is discouraged by the managing agency, or along levees where a paved trail would require frequent maintenance and may present safety concerns.

Obstructions and Clearances

The Bay Trail includes a zone around the trail free of any perpendicular or overhead obstructions. Obstructions may present hazards to safe, unimpeded trail use. Obstructions may also limit sight lines and/or funnel trail users toward the center of the trail, hence effectively narrowing the width of the usable trail surface.

Horizontal Obstructions

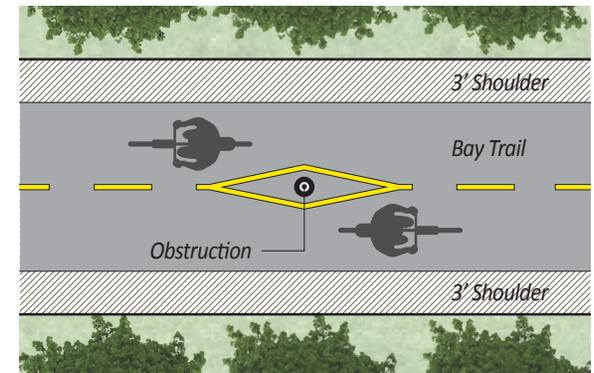
There are many types of horizontal obstructions such as:

- Bollards
- Lights poles and fixtures
- Sign poles and signs of all types
- Bicycle racks
- Benches and drinking fountains
- Fences and walls
- Railings
- Utility boxes
- Curbs
- Boulders
- Landscaping
- Drains
- Trees



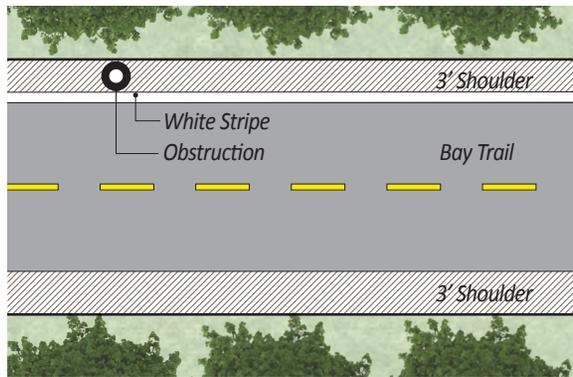
Obstructions within the Trail

When obstructions are within the trail, solid yellow diamond pavement markings should be used. The obstruction should also be identified with yellow reflective tape.

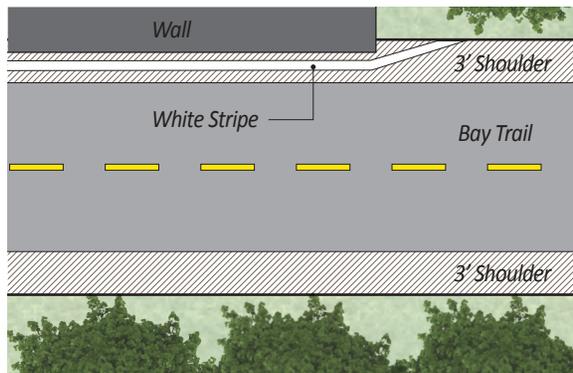


Obstructions within the Trail Shoulder

When an obstruction is unavoidable within the trail shoulder, a solid white stripe should be located along the edge of the trail to visually notify the Bay Trail user about the presence of the obstruction.

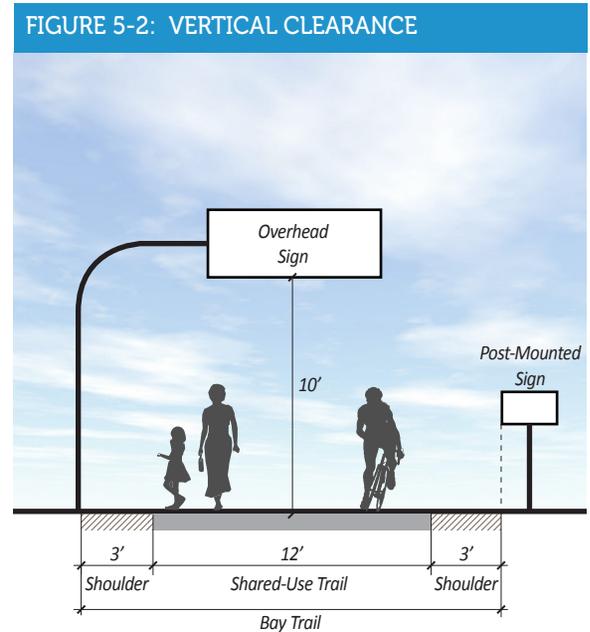


When located within 3 feet of the paved trail, all curbs, freestanding walls, railings on bridges and boardwalks, and retaining walls should be treated as obstructions. There should be a continuous white stripe at the edge of the trail for the length of the feature.



Vertical Clearance

- Vertical clearances include such items as:
 - ▶ Undercrossing and tunnel ceilings
 - ▶ Overhanging trees
 - ▶ Signs
 - ▶ Overhead security fencing
- A 10-foot vertical clearance across the width of the Bay Trail and shoulders is desirable. This clearance applies to signs, overhead fencing, tunnel ceiling heights, and vegetation.

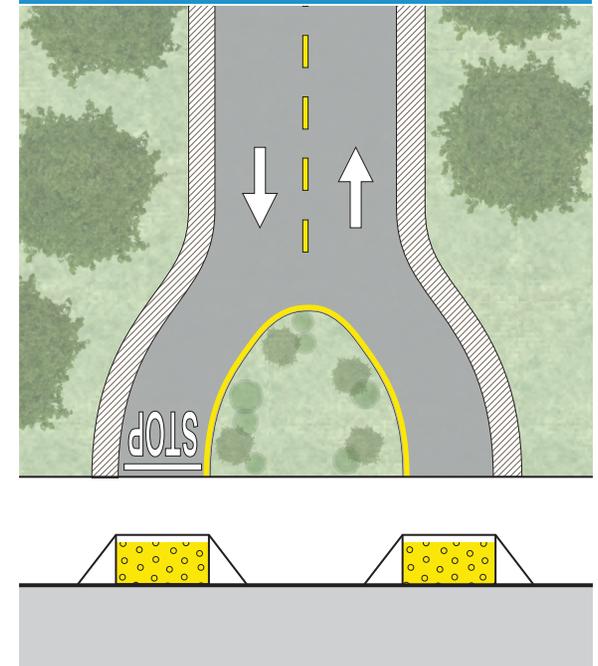


Barrier Treatments for Trail Entryways

- **Bollards** can be removable, fixed, retractable, or flexible. Whether stand-alone or grouped together, bollards are often used to discourage non-authorized motor vehicles from accessing the Bay Trail. Installing bollards should be considered only as a last resort.
- **Fold-down/collapsible bollards** should not be installed along the Bay Trail because they can be a hazard to users, even when left in the down position.
- **Other design elements** that would help discourage motorized vehicles from entering the Bay Trail are:
 - ▶ Gateway design with a strong sense of identity and transition.
 - ▶ Entry signage.
 - ▶ Prohibition signage with associated fine for violations.
 - ▶ Ramps and trail shoulders that look like a shared-use trail, not driveways.
 - ▶ Split-path entry into inbound and outbound lanes divided by a narrow median. This has the added benefit of alerting cyclists about the intersection ahead and the need to slow down.



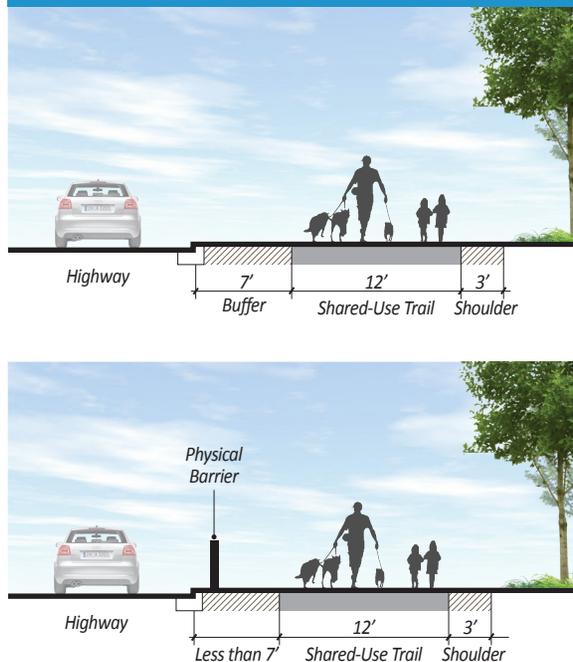
FIGURE 5-3: TYPICAL SPLIT-PATH ENTRY DESIGN



Clearance Between the Bay Trail and Streets and Highways

- The separation between the edge of the Bay Trail and the edge of a parallel road or street should be at least 7 feet.
- If the trail is less than 7 feet away from the street, a fence or other physical barrier separation should be included to prevent the Bay Trail user from straying into the street. A physical barrier should be at the outside edge of the shoulder (3 feet away from the trail) unless obstacle striping is used at the edge of the trail.

FIGURE 5-4: CLEARANCE BETWEEN THE BAY TRAIL AND STREETS



Railings and Visibility

In some situations, the Bay Trail may need to include protective railings. Generally, railing design and materials should preserve views to the Bay and should relate to the architectural or landscape style of the surrounding area. There are three types of railings that could be used along the Bay Trail:

- **Guard Rails:** used to prevent the trail user from falling off a bridge or boardwalk. The height above the adjacent ground or water surface that is used is established by local code. Typically this height is 30 inches. The guard rail should be between 42 and 48 inches in height with no opening greater than 4 inches. Design considerations about guard rails include:
 - ▶ Allowing maximum views, especially on bridges. Using vertical pickets or horizontal wire cables is recommended.
 - ▶ Providing additional hand rails for accessibility purposes.

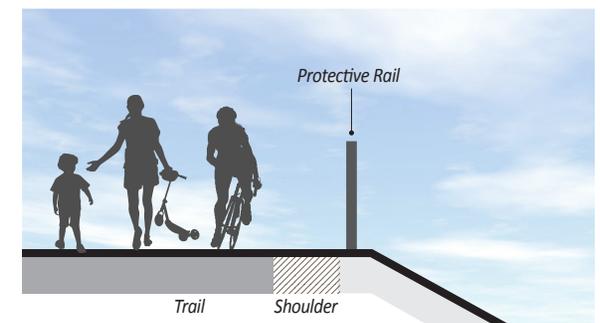


- ▶ Including wide “rub rails” in some settings to reduce the likelihood that a bicyclist’s handlebar might be caught by the railing.

- **Hand Rails:** used for accessibility purposes on slopes and to help prevent the trail user from going off the trail. Hand rails must meet the dimensioning requirements of the U.S. Access Board and may have broad openings that do not constrain views.



- **Protective Rails:** used to help prevent the trail user from going off the trail into a dangerous situation such as a steep side slope. Like hand rails, protective rails may have broad openings, but should be between 42 and 48 inches in height.



Signs and Markings (see also Wayfinding and the Bay Trail Logo)

- **Signs:** Prohibition, regulatory, and warning signs are an integral part of the Bay Trail. While they are a key component in managing Bay Trail use, signs should be used only when needed. The use and placement of signs and markings are dependent on specific site circumstances.
- **Pavement Markings:** Common pavement markings stenciled on the trail and used to direct and manage use along the Bay Trail include:
 - ▶ Solid yellow center lines to separate directions of travel and indicate no passing by trail users. A solid center line stripe is commonly used in heavily travelled sections of trail or around blind turns.



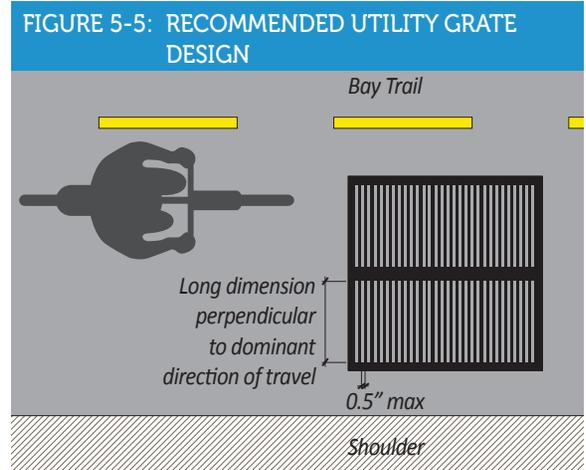
- ▶ Striped yellow center line to separate directions of travel along heavily used sections of trail but where view lines allow passing.
- ▶ Solid yellow markings to inform the trail user of obstructions within the trail (see “Obstructions and Clearances” in Section 5.1).
- ▶ Solid white shoulder stripes to delineate the edge of the trail or to inform the trail user of obstructions.
- ▶ Solid white stripes to separate users into individual lanes.
- ▶ White bicyclist and pedestrian symbols with arrows stenciled on the trail to indicate individual lanes and direction of travel.
- ▶ White railroad crossing, road crossing, stop, or yield markings.
- ▶ Multiple colors and patterns at crosswalks (see “Intersection Crossings” in Section 5.4).



Underground Utilities

These consist of electrical, communications, water, sanitary sewer, or stormwater utility systems.

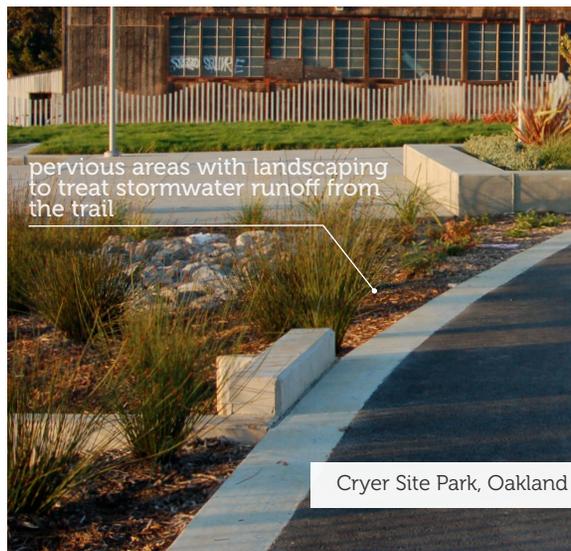
- Where underground utilities exist within the Bay Trail corridor, utility lines and access covers should be located away from the Bay Trail and shoulders, not within the trail.
- If unavoidable and when within the Bay Trail or shoulders:
 - ▶ Utility covers must meet accessibility guidelines.
 - ▶ Utility grates with openings, such as catch basins or drop inlets for stormwater, must be bicycle-safe to prevent a bicycle wheel from catching or falling into the slots of the grate.



Managing Water Quality

A paved Bay Trail has runoff and, where the trail is used by service vehicles, that runoff may enter the Bay. Design of the Bay Trail should:

- Reduce trail runoff by minimizing impervious areas that are directly connected to a storm drain system.
- Use permeable paving systems such as porous concrete, porous asphalt, or permeable pavers, where possible. If appropriate to the surrounding setting, use gravel.
- Direct runoff from the trail's impervious areas to pervious areas, including permeable trail shoulders, and/or small swales or retention areas that are outside the trail shoulder.



Mandatory Design Standards and Common Design Exceptions

The California Highway Design Manual contains selected mandatory design standards that apply to bikeways. “Mandatory Design Standards” are those requirements presented in the HDM that are considered most essential to achievement of overall design objectives and use the word “shall”. Many pertain to requirements of law or regulation.

In certain instances the Bay Trail will need to accommodate the mandatory design standards. Mandatory standards related to trails address:

- Width of paved trail and shoulders
- Horizontal clearance to obstructions
- Bicycle-safe drainage grates



- Clear width between railings on structures
- Vertical clearance to obstructions
- Separation between the edge of the trail and the edge of a roadway
- Design speed
- Stopping sight distance
- Location in the median of a freeway or expressway

Where mandatory design standards required by the managing or funding agency for the Bay Trail cannot be achieved, a design exception should be documented and additional design considerations should be taken into account. The common scenarios include:

- Horizontal alignment geometrics and the need to reduce speed limits, provide center line striping, and assure visibility around curves.
- Reduced trail widths and the need to provide smooth transitions, safety signs, and/or pavement markings.
- Obstacles within the shoulder of the trail and the need to provide pavement markings and /or signs to notify the user of their presence.

5.2 BAY TRAIL IN SPECIAL CIRCUMSTANCES

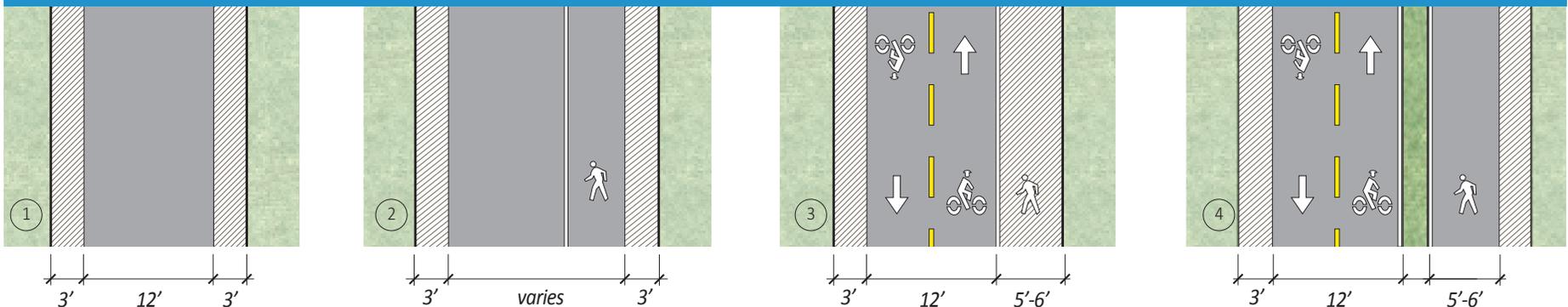
Bay Trail in High Use Areas

On high-volume sections of the Bay Trail, consider separating bicycle and pedestrian use of the trail to both facilitate use and to discourage user conflicts related to different travel speeds. In all cases separated facilities need to provide all trail users with a Bay experience. Separating bicycle and pedestrian use of the trail can be done in a variety of ways, each of which involves a wider trail corridor. Design options are:

- a wider trail with striping and pavement markings to separate bicyclists from pedestrians (Figure 5-6, #2).
- 5- to 6-foot shoulders on one side of the trail or both, with signs and/or pavement markings directing pedestrian use to the shoulder (Figure 5-6, #3).
- two paths separated by landscaping (Figure 5-6, #4).



FIGURE 5-6: OPTIONAL TRAIL DESIGNS



Bay Trail in a Limited Right-of-Way

In some locations, it is not feasible to fit the Bay Trail into the available right-of-way. Alternatives to consider that would assure continuity of the Bay Trail include:

- **Separated Bikeways (Class IV Bikeways):** In some areas, Bay Trail bicyclists may need to ride on city streets. In these instances, it may be necessary to redesign an adjacent street right-of-way to create a dedicated bikeway with pedestrians using the sidewalk. This is particularly relevant where there is a limited number of driveway crossings that would conflict with bicycle use. Bay Trail separated bikeways should include:
 - ▶ A 12-foot-wide two-way bicycle facility.
 - ▶ A parallel physical barrier (guardrails, raised medians, large planters, or permanent bollards) to protect Bay Trail cyclists from adjacent motor vehicle traffic. Permanent physical barriers are preferred to parked cars.
 - ▶ A yellow dashed center line stripe and white edge striping.
 - ▶ Where the separated bikeway is at the same grade as either parking or a pedestrian sidewalk, different pavement color/texture could be used to visually separate the bikeway.
 - ▶ While two-way separated bikeways are recommended, in some instances one-way protected bikeways on each side of the street could be considered. An example would be updating existing Class II Bicycle Lanes to one-way protected bikeways to avoid reconfiguring intersections.

FIGURE 5-7: SEPARATED BIKEWAY BUFFERED BY PERMANENT BOLLARDS AND PARKING

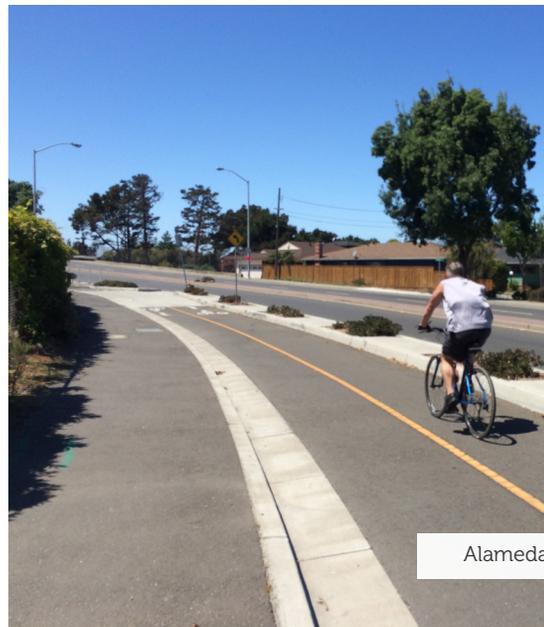
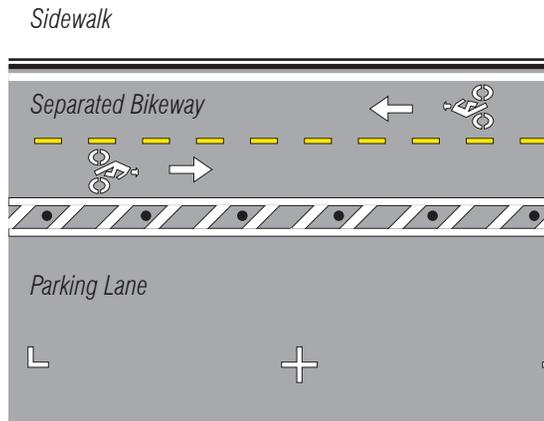
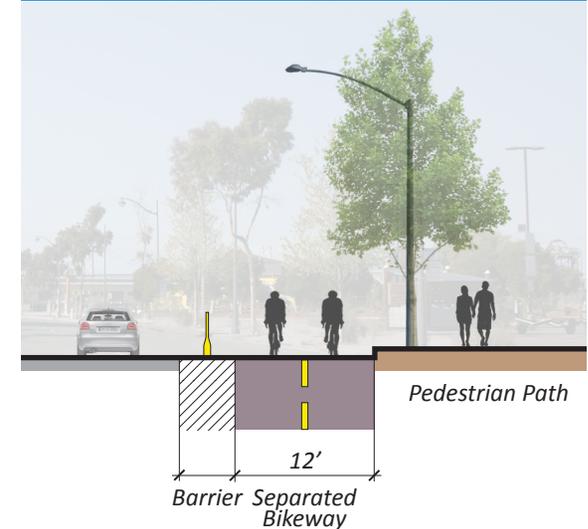


FIGURE 5-8: SEPARATED BIKEWAY WITH BARRIER



- Class II Bicycle Lanes:** In some urban cases there may be physical conditions where it is not possible to develop a separated bikeway within the width of the road right-of-way, even with the option of reconfiguring or downsizing traffic lanes. In such situations, consider a Class II Bicycle Lane with pedestrians using the sidewalk. A Class II Bicycle Lane serving as the Bay Trail should begin and end at traffic controlled intersections. The Bay Trail bicycle lane should be 6 feet wide. The bike facility should be signed as the Bay Trail with appropriate directional signs, safety signs and markings, and/or other bicycle signal control devices at intersections to safely connect with the shared-use portions of the Bay Trail.



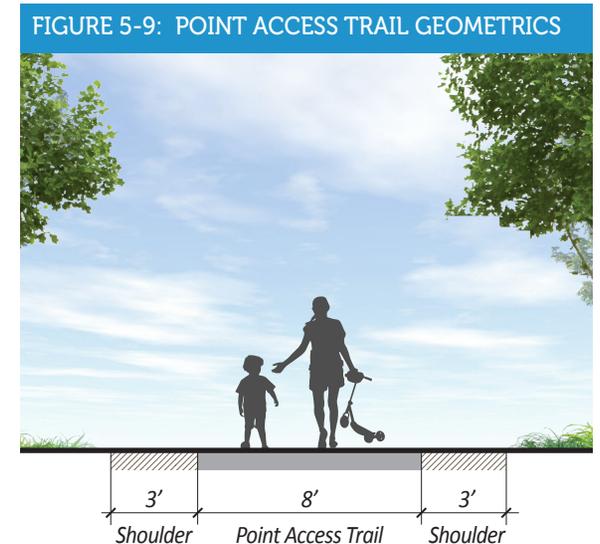
Bay Trail to Destinations

There are settings where the Bay Trail takes on the role of a short point access trail leading to a destination but not continuing beyond it. Examples include connections to ferry terminals, a visitor center, marinas, or wildlife overlooks. These segments of the Bay Trail, depending on the managing agency involved, may have restrictions about use or requirements regarding types of trail surfacing.

- Trail Geometrics:** Generally the trail geometrics should be the same in these situations as any segment of the Bay Trail. In those segments the width of the trail should be at least 8 feet to accommodate pedestrians, bicyclists, and service and emergency vehicle access.



- Alternative Surfaces:** In selected circumstances, compacted gravel surfacing or other natural material, such as decomposed granite that is firm and stable and meets accessibility requirements, may be possible.



5.3 WAYFINDING AND THE BAY TRAIL LOGO

The Bay Trail is a significant public circulation feature and should be visually identifiable. The primary means of identification is through use of the Bay Trail logo signage. The length of the Bay Trail and diversity of environments through which it weaves makes it a spectacular trail, as well as a challenge to mark. With this in mind:

- The Bay Trail logo should be easy for anyone to recognize from near (small signs) or far (large signs).
- Recognition of the Bay Trail is critical to inform users that they have arrived at the trail, direct users along the trail, and in some cases, to inform users that they are still on the trail and have not made a wrong turn.

The Bay Trail logo identifies trails within the Bay Trail system as distinct from other connecting trails. As an icon, the logo sign may be used for both identification and directional purposes. It should be used in conjunction with other directional, management, prohibition, and warning signs of the managing agency. The Bay Trail logo should only be used on the Bay Trail itself. Signs not on the Bay Trail itself but directing people to the Bay Trail should not use the logo and should instead spell out “San Francisco Bay Trail.”

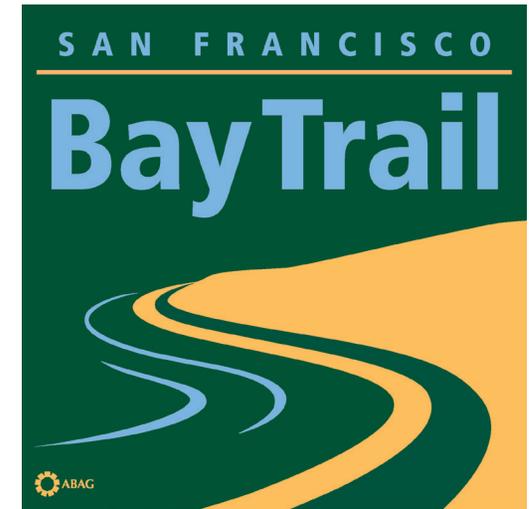
Identification Logo Sign

The size of a Bay Trail logo sign should be based on scale of the surrounding environment and infrastructure as well as the user group.

There are three standard sizes of Bay Trail logo signs:

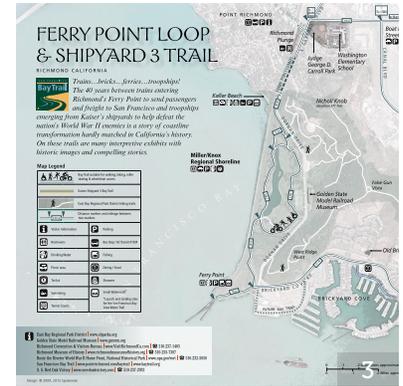
- **Large** Bay Trail logo signs (18" x 18") should be located within the user's view at the entrance from a trailhead to each Bay Trail segment, and where a large visible sign is needed to identify the trail crossing a street. This size of logo sign is useful to both trail users and passing motorists.
- **Medium** Bay Trail logo signs (12" x 12") should be located at intersections with other trails, on long trail stretches with intersections, and along urban streets where the Bay Trail consists of sidewalks and either Class II bicycle lanes or a Class IV separated bikeway.
- **Small** Bay Trail logo signs (3" x 3") should be used in park settings and also be located along the trail or when either: the pedestrian portion of the Bay Trail is along sidewalks with adjacent separated bikeways or Class II bicycle lanes; or there are long segments of Bay Trail that run on or parallel to city streets where there are many intersections.

FIGURE 5-10: VARIOUS TYPES AND SIZES OF BAY TRAIL SIGNS



Ideally, there should be one of the above Bay Trail signs at appropriate intervals to reassure trail users they are still on the Bay Trail. Once a user has entered the trail and where long segments exist without intersections, no further Bay Trail signs are needed. However Bay Trail logo signs are needed at entryways and for wayfinding/direction purposes. In urban areas where the Bay Trail crosses streets or intersects with other pedestrian and bicycle facilities, Bay Trail logo signs are needed at more frequent intervals. While a 1/4 mile interval is reasonably appropriate, shorter intervals may be needed where there are numerous intersections or along Bay Trail separated bikeways.

1. Bay Trail Logo, Wayfinding, + Management Signs, Palo Alto | Source: SF Bay Trail Project
2. Bay Trail Logo + Bicycle Lane Sign, Alameda Avenue, Oakland | Source: SF Bay Trail Project
3. Bay Trail Logo + Wayfinding Sign, Ferry Point Loop, Richmond
4. Bay Trail Logo + Directional Signs, Larkspur Ferry Terminal | Source: Flickr (SF Bay Trail Project)
5. Bay Trail 3' Diameter Surface Plate Concept
6. Bay Trail Logo + Funding Partners, Oakland
7. Bay Trail Logo + Directional Signs, Emeryville | Source: Flickr (SF Bay Trail Project)
8. Bay Trail Logo + Management Signs, American Canyon | Source: SF Bay Trail Project
9. Bay Trail Logo, Management Signs, + Wayfinding Map, Emeryville



The Bay Trail identification logo sign may be used on its own or in combination with other management or creative wayfinding signs. Examples include combining signs with that of the San Francisco Bay Water Trail or the San Francisco Bay Conservation and Development Commission’s public shoreline access signage. When possible, place Bay Trail logo signs on existing sign or utility poles if such location clearly meets wayfinding sign needs and goals.

Using the Bay Trail logo as a painted pavement marking is discouraged unless long-term maintenance can be assured. Large logos made of a durable material and embedded in the trail pavement, similar to cast iron utility covers, could be a viable alternative to pavement logo paintings.

Directional

Along the Bay Trail, the logo sign could be complemented with arrows in advance of a trail intersection to indicate the direction of the Bay Trail.

FIGURE 5-11: DIRECTIONAL BAY TRAIL SIGNAGE



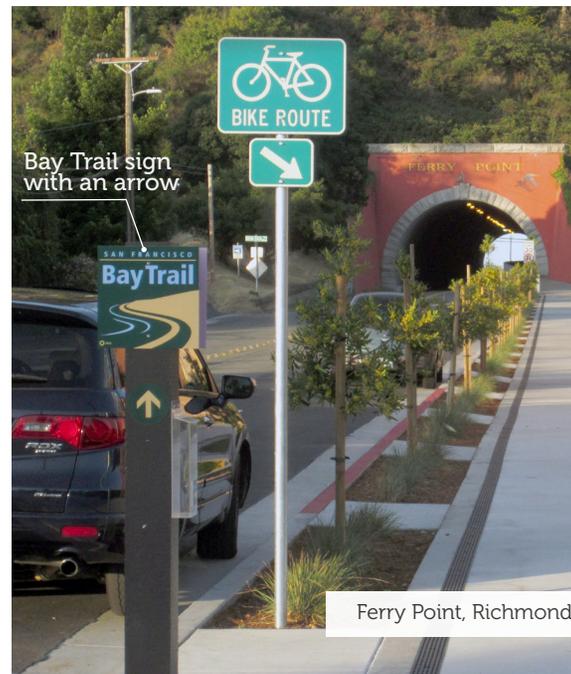
Other Applications

- Where the construction of a segment of the Bay Trail is recognized as a collaboration of many public and non-profit organizations.
- Where construction of a segment of the Bay Trail has been supported by a grant from the Bay Trail Project.
- On interpretive signs and brochures that inform and educate visitors about historical, cultural and natural features along the trail.
- On wayfinding map signs.
- On a temporary construction sign along the Bay Trail.



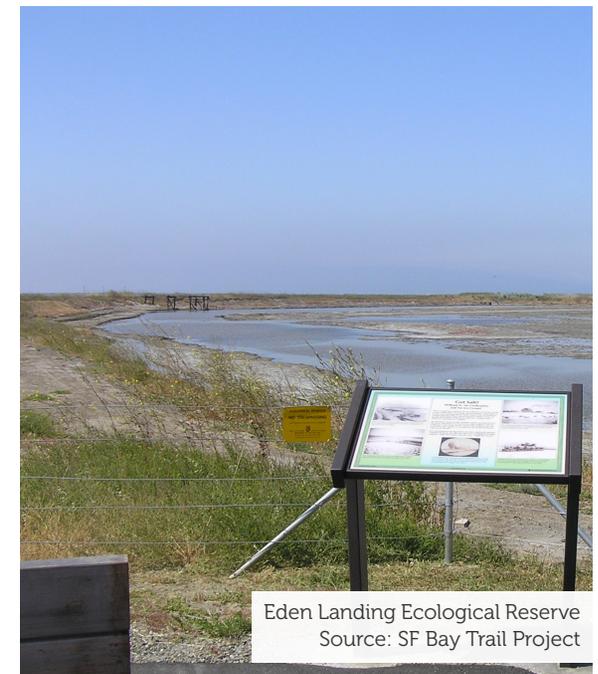
Bay Trail sign on an interpretive sign

Marina Bay
Source: SF Bay Trail Project



Bay Trail sign with an arrow

Ferry Point, Richmond



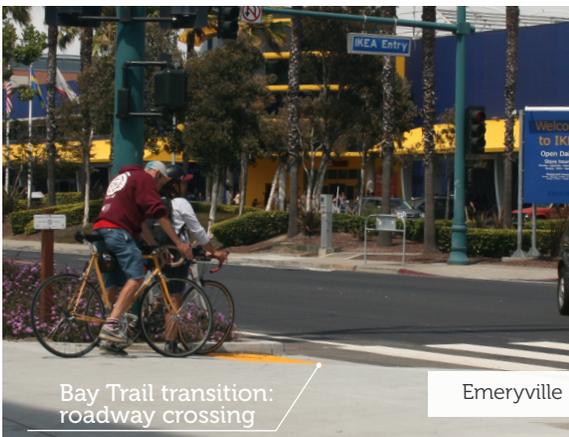
Eden Landing Ecological Reserve
Source: SF Bay Trail Project

5.4 INTEGRATION INTO THE LOCAL STREET SYSTEM

Transitions to/from On-Street Facilities

There are locations where the Bay Trail will transition from a separate shared-use trail to an on-street bicycle facility and sidewalk. To ensure a smooth and safe transition, different design considerations should be given to pedestrians and bicyclists.

FIGURE 5-12: BICYCLE CROSSING WARNING SIGNS



- **Pedestrians**
 - ▶ Provide wayfinding signage at decision-making points.
 - ▶ Where pedestrians need to cross the street to get to the Bay Trail, design crosswalks as specified in the next section, “Street Crossings.”
- **Bicyclists:** It is a challenge to provide a safe roadway crossing when bicyclists need to cross the street to join the trail. If not adequately designed, then bicyclists may ride illegally on the sidewalk or the wrong way in a bicycle lane. Bicycle transitions to the Bay Trail from a street should:
 - ▶ Be made at a location where the motorists have positive traffic control (e.g., stop signs or signalized crossings and intersections).
 - ▶ Provide advance warning signs to inform motorists on the roadway that the Bay Trail crossing is approaching and to look for bicyclists as well as pedestrians.
 - ▶ Provide advance warning signs to inform bicyclists on the roadway that the Bay Trail is approaching and that they need to cross the street.

Street Crossings

The Bay Trail at times crosses local streets. Trail design for street crossings varies depending on whether the crossing is midblock or at an existing intersection of two streets. Both cases meet the definition of a “Bicycle Path Crossing” as defined

by the California Vehicle Code (CVC 231.6). Stop controls, other warning signs, or designs to slow cars and/or trail users at the crossing could be considered.

- Where there is no traffic signal, then design of the Bay Trail crossing should employ any number of tools including high visibility pavement markings, trail and roadway crossing signs, and median pedestrian (and bicycle) refuges if possible. This applies to scenarios both when the motorists have the right-of-way and when they don’t.
- If the motorist does have the right-of-way, additional design tools such as rectangular rapid flashing beacons or pedestrian hybrid beacons should be considered.

Assigning the Right-of-Way

The total and relative volumes of use between the trail and roadway determine who has the right-of-way and the type of traffic controls to use at a particular intersection of the Bay Trail with a roadway. All trail users (pedestrians, bicyclists, others) should be counted in the trail volume.

- When the Bay Trail intersects a local or collector street, the right-of-way typically goes to the roadway. If sight distance is adequate, a YIELD sign can be used in lieu of a STOP sign for the trail user. Where the volume on the roadway increases and becomes more difficult to cross, a median

- **Trail not Shared by Bicycles and Pedestrians:**

When bicyclists and pedestrians are on two separate trails or on the same trail separated through pavement markings:

- ▶ Use ladder/zebra style pavement markings for the pedestrians and outside parallel lines for the bike crosswalk with no markings in the center where the bicyclists would ride. Each crosswalk should be approximately the width of the approaching pedestrian and bicycle trails, respectively.
- ▶ Use a non-slippery green-colored pavement surface when not signalized, understanding that use of a solid colored pavement surface presents ongoing maintenance requirements.

Intersection Crossings

Guidelines for mid-block crossings also apply to where the Bay Trail crosses at an existing intersection of two roadways. Additionally, the following three design scenarios can be applied to intersection crossings.

- Providing bicycle-specific traffic signals (also known as signal “heads”). These should be used in conjunction with standard pedestrian signals at a signalized intersection with timing appropriate to the trail users.
- Coordinating existing crosswalk or protected intersection designs on a site-specific basis.
- Assuring curb cuts and truncated domes cover the full width of the trail.



1. Bicycle-specific traffic signals
2. Pavement markings indicating a bicycle crosswalk
3. Outside parallel lines for a bicycle crosswalk
4. Colored paving for bike crossing
5. Protected intersection | Source: City of Davis
6. Mid-block crossing on Cove Road, Richmond
7. Colored paving for bike crossing | Source: Flickr (Dylan Passmore)

5.5 RAIL AND LIGHT-RAIL LINES

No national standards or guidelines dictate rail-with-trail facility design. Therefore special care must be taken to ensure that the safety of trail users is protected when near a rail facility. Safety includes preventing physical contact and, depending on the speed of the train, the possibility of ballast or other material being ejected from the train onto the trail.

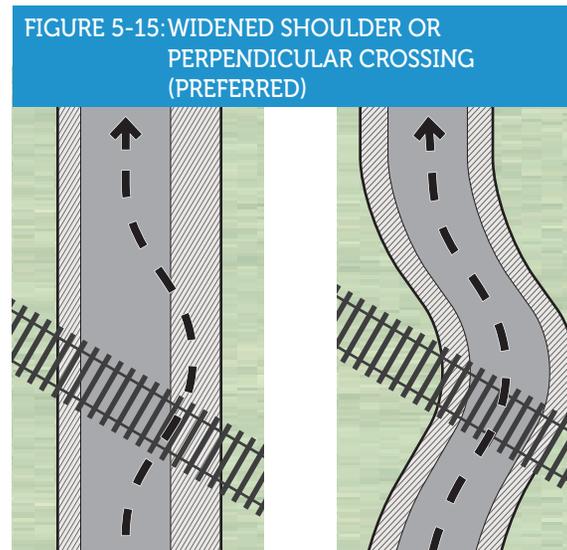
■ Paralleling an Active Rail Line

- ▶ The maximum setback possible should be made between the Bay Trail and an active railroad track.
- ▶ A 6-foot-high fence or physical barrier should separate the trail from active



railroad tracks. Fence meshing or rails should be sized and spaced to prevent climbing. Depending on the surrounding land use circumstances, there may be additional safety requirements placed on the managing agency (see also Security, Vandalism, and Privacy in Section 5.11).

- ▶ A combination of vegetation, ditches, berms and elevation changes combined with fencing could be used to enhance the separation.
- **At-Grade Rail Crossings:** All railroad crossings are regulated by the California Public Utilities Commission (CPUC) and all new trail crossings must be approved by the CPUC. An at-grade rail or light-rail crossing could be considered where bridges or undercrossings are not feasible, or where trail use levels are low. The crossing should:
 - ▶ Be at least as wide as the trail and shoulders.
 - ▶ Be straight and at right angles to the rails.
 - ▶ Have clear line-of-sight up and down the track corridor.
 - ▶ Include a smooth surface transitioning over the tracks.
 - ▶ Include flangeway filling strips to accommodate U.S. Access Board guidelines for pedestrians.
 - ▶ Include active crossing warning systems (crossing guards and signals) as required.
 - ▶ For trail segments crossing railroad tracks and where a skewed angle is unavoidable, the shoulder width of the trail could be widened to permit bicyclists to cross at right angles.



5.6 OVER OR UNDER

The edges of the San Francisco Bay include many circumstances where the Bay Trail must go over or under obstacles, such as freeways, streets, railroads, rivers, and the Bay's waters to achieve continuity.

Ramps

- Going either up or down involves ramping. Accessibility guidelines for ramps related to grades, rails, and resting places apply to the Bay Trail.

Bridges, Viaducts, and Boardwalks

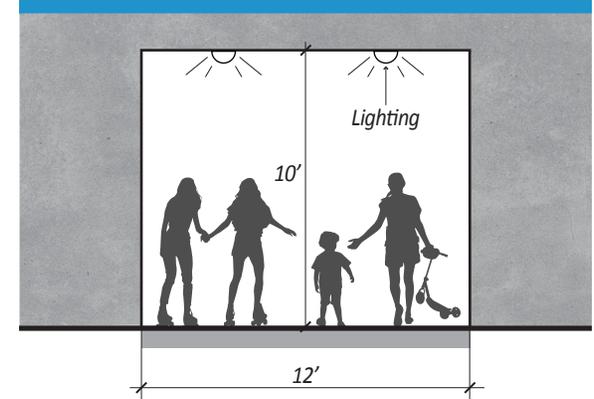
- The clear, unobstructed width of the Bay Trail between railings should be at least 12 feet.
- Structures could be designed to carry service and emergency vehicles.
- The clearing height from overhead obstructions, including fencing, should be 10 feet.
- The design style of these Bay Trail features should be one that is compatible with surrounding land uses, habitats, and adjacent developments.

Tunnels

- The clear, unobstructed width of the Bay Trail between tunnel walls should be at least 12 feet.

- The ceiling height should be at least 10 feet.
- Additional lighting or security cameras may be required by the managing agency.
- If the tunnel is prone to flooding, cautionary signs and/or possible trail closure mechanisms (e.g., red and white striped gate arms, warning lights) should be considered along with adequate drainage and pump designs.

FIGURE 5-16: TUNNEL CLEARANCE

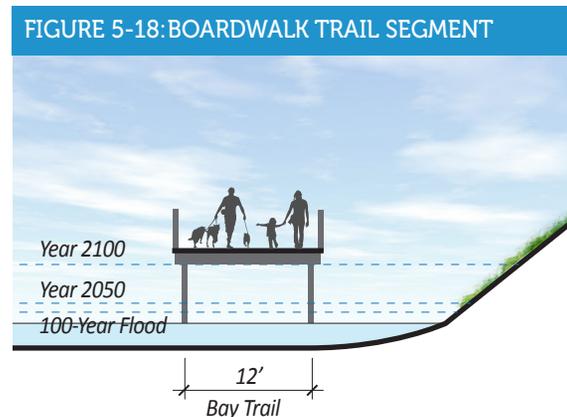
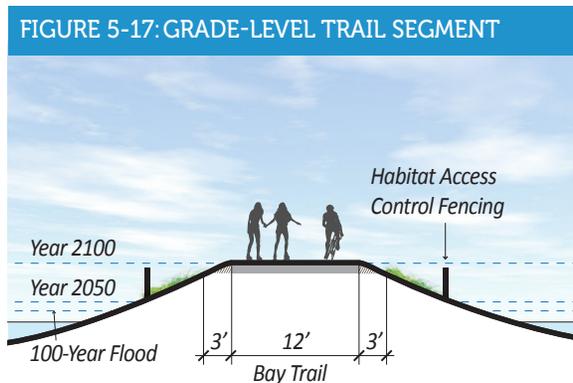


San Mateo Creek Bridge

5.7 SEA LEVEL RISE

While the Bay Trail is ideally located at the edge of the Bay to enjoy views of the water, that proximity often creates a vulnerability to rising sea levels. When at the edge of the Bay, a new segment of the Bay Trail may also afford the opportunity of protecting inland areas from the effects of sea level rise.

- **Elevation:** The elevation of the Bay Trail should accommodate projected future sea level rise and should be coordinated with the San Francisco Bay Conservation and Development Commission and other regulatory agencies.
 - ▶ The base trail elevation should ideally be set above the projected high water line.
 - ▶ For bridge and boardwalk segments of the Bay Trail, the lower support surface should be set above the projected high water line.
 - ▶ Where space is limited, the Bay Trail may



need to be cantilevered or elevated above the shoreline. In some instances, additional clear vertical space should be allotted so that boats may navigate underneath.

- ▶ Selected segments of the Bay Trail may be designed as a “floating trail” changing elevations with the tides.
- **Materials:** Bridges and boardwalk sections of the Bay Trail that may be subject to direct tidal effects should be concrete or other suitable materials that can withstand the corrosion effects of salt water. Boardwalks should be constructed either with a concrete surface or planks that are oriented horizontally to the direction of bicycle travel and placed closely together to essentially have no gaps. Where the Bay Trail is located on top of a levee:
 - ▶ Riprap revetments should be constructed of properly sized and placed materials that meet sound engineering criteria for durability, density and porosity. The material should be generally spheroid-shaped and placed outside the trail shoulder width of 3 feet.
- ▶ Concrete rubble, asphalt concrete, concrete pieces with exposed rebar and large or odd-shaped pieces of concrete should not be used.
- ▶ Riprap material should be placed so that a permanent shoreline is established by means of an engineered slope not steeper than a ratio of two (horizontal) to one (vertical).
- ▶ Riprap erosion control structures should include the placement of a filter layer protected by riprap material of sufficient size to withstand wind and wave conditions at the site.
- ▶ Where marsh establishment has a reasonable chance of success, the design of the trail’s protective structure should include provisions for non-structural methods, such as establishing marsh and transitional upland vegetation as part of the protective structure.

5.8 WILDLIFE COMPATIBILITY

By its very definition and location adjacent to the San Francisco Bay, the Bay Trail physically and visually shares the margins of the Bay with hundreds of aquatic, terrestrial, and avian species. Some of these species are endangered, and without stewardship, face decline. Depending on the site circumstances, there are a number of tools the managing agency can use to minimize public access and wildlife compatibility conflicts.



Alignment: The Bay Trail should be configured to provide trail users with a fulfilling, varied, and interesting access experience while encouraging users to stay in designated areas and limiting the creation of informal routes. The Bay Trail alignment should follow the perimeter of sensitive habitat areas rather than bisecting them.



Parking and Staging: Because use levels along the Bay Trail typically decrease the further away from a trailhead, Bay Trail parking and staging areas should be sited away from the most sensitive habitats.



Education: Interpretive signs should be located at staging areas, and at transition points where the Bay Trail nears or is adjacent to sensitive habitat areas to:

- ▶ Increase knowledge of users (regarding wildlife and the implications of users' actions).
- ▶ Foster public support for conservation and restoration programs.
- ▶ Educate the visitor about the natural resources of the area.



Observation Points: At strategic locations observation points off of the Bay Trail could be provided to direct use, allow desired visual access, and limit direct proximity to wildlife. Observation points would help provide predictability of human use, increasing the ability of wildlife to adapt to human activity. The observation points should accommodate both the individual trail user and small groups. They may include interpretive panels to educate the user and provide telescopes that will allow views and further discourage access into the habitat area.



Materials Used for Perching: Not providing raptors perching opportunities near Bay wetlands is important to protect many species. To avoid perching habitat within or near protected species habitat the Bay Trail should:

- ▶ Avoid use of tall signs as much as practical.
- ▶ Assure the diameter of the top rail of bridge and boardwalk railings are scaled to be a “no perch” feature for raptors.



Lighting: Locate night lighting away from sensitive habitat areas if it is shown to be incompatible with adjacent wildlife.

Physical and Visual Separation: One or a combination of the following features should be used to physically and visually separate the Bay Trail from habitat areas.



Habitat Access Control Fencing: 4-foot-high wildlife-friendly fencing that includes a gap of 4 to 6 inches at the base to allow wildlife movement underneath. Signs should be posted at regular intervals along the fence stating “no access; protected wildlife area”. The fencing should be set back from the trail and located at a lower elevation to allow users to experience unobstructed distant views to the Bay.



Open Space Buffers: An upland buffer between the Bay Trail and wetland areas. The width should vary and could include screening vegetation and habitat access control fencing.



Moats and Wetlands: A series of seasonal wetland areas and extended drainage channels parallel to the Bay Trail. These can provide additional physical barriers to discourage users from leaving the trail and entering sensitive habitat areas.



Vegetation: Screening vegetation strategically used near the trail to physically separate the Bay Trail from selected high value Bay habitats while still allowing views to the surrounding mountains and ridgelines. Vegetation can:

- ▶ Provide a physical barrier to keep Bay Trail users out of sensitive areas.
- ▶ Provide a “natural” barrier that also enhances native plant communities.
- ▶ Help control erosion.
- ▶ Provide additional wildlife habitat/wildlife cover.



1. Observation point, Alviso | Source: SF Bay Trail Project
2. Vegetation buffer, San Rafael | Source: SF Bay Trail Project
3. Education, Hamilton Wetland Restoration Project
4. Open water buffer, Don Edwards San Francisco Bay National Wildlife Refuge
5. Wetland moat and stabilized gravel trail surface, Hayward Regional Shoreline
6. Fencing and stabilized decomposed granite trail surface, Hamilton Wetland Restoration Project | Source: SF Bay Trail Project
7. Staging areas, Don Edwards San Francisco Bay National Wildlife Refuge

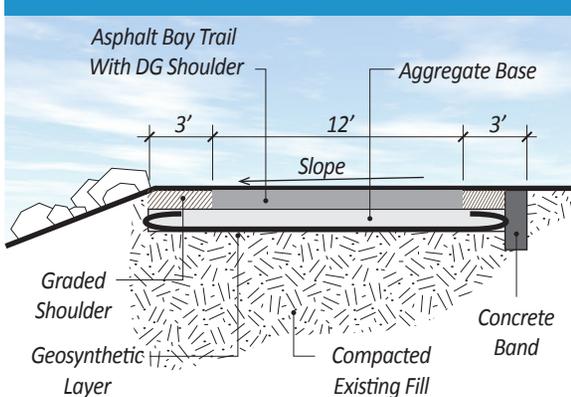
5.9 SUSTAINABILITY

The Bay Trail should be designed to maximize sustainability in terms of materials selection and design. For many managing agencies, the typical project life of an asphalt trail is 25 years. There are a number of design considerations that can reduce ongoing maintenance costs and extend the life of the trail.

Trail Structure

- ▶ Over time, a concrete trail will need less maintenance than asphalt; and an asphalt trail less maintenance than a gravel or natural surface one.
- ▶ Base the trail cross-section on geotechnical recommendations emphasizing durability whether for pedestrian/bicycle loads or accommodating use by service and emergency vehicles.
- ▶ Design foundations/footings for

FIGURE 5-19: TRAIL STRUCTURE



retaining walls and bridge structures on a conservative assumption regarding earthquake hazards. Where possible, avoid designing for a pedestrian load only.

Drainage

- ▶ Assure there is no overspray from adjacent irrigation systems onto the trail.
- ▶ Assure there is positive drainage away from the trail and that there are no standing puddles created from stormwater, storm surges, or irrigation.
- ▶ Direct all trail drainage through water quality systems or use permeable paving systems where allowable.

Edging

- ▶ Consider specifying flush concrete header curbs (unless the trail is concrete) along the trail edge to reduce maintenance and retain integrity over time.
- ▶ For trail shoulders, use natural surface stabilizers.

FIGURE 5-20: DRAINAGE

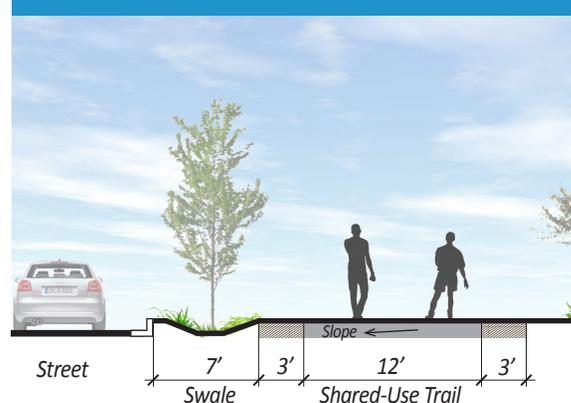
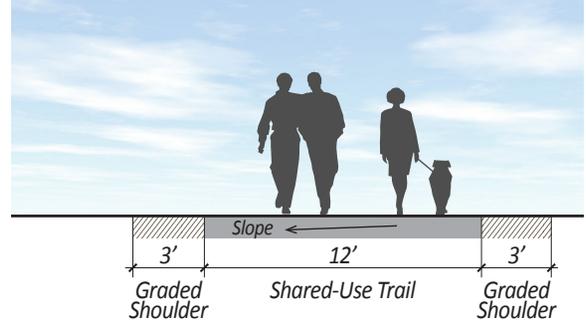
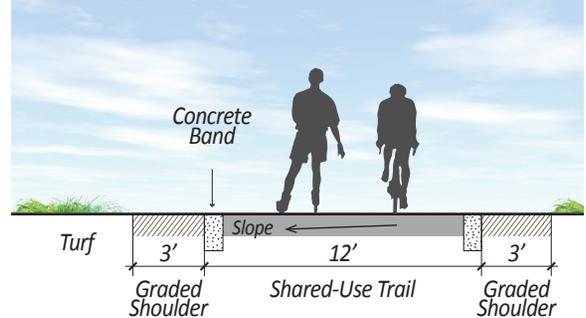


FIGURE 5-21: EDGING OPTIONS

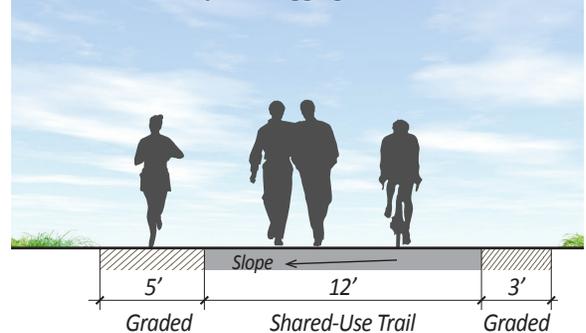
Paved Trail



Paved Trail in Turf Area



Paved Trail and Unpaved Jogging Trail



■ **Trail-Related Furnishings and Materials**

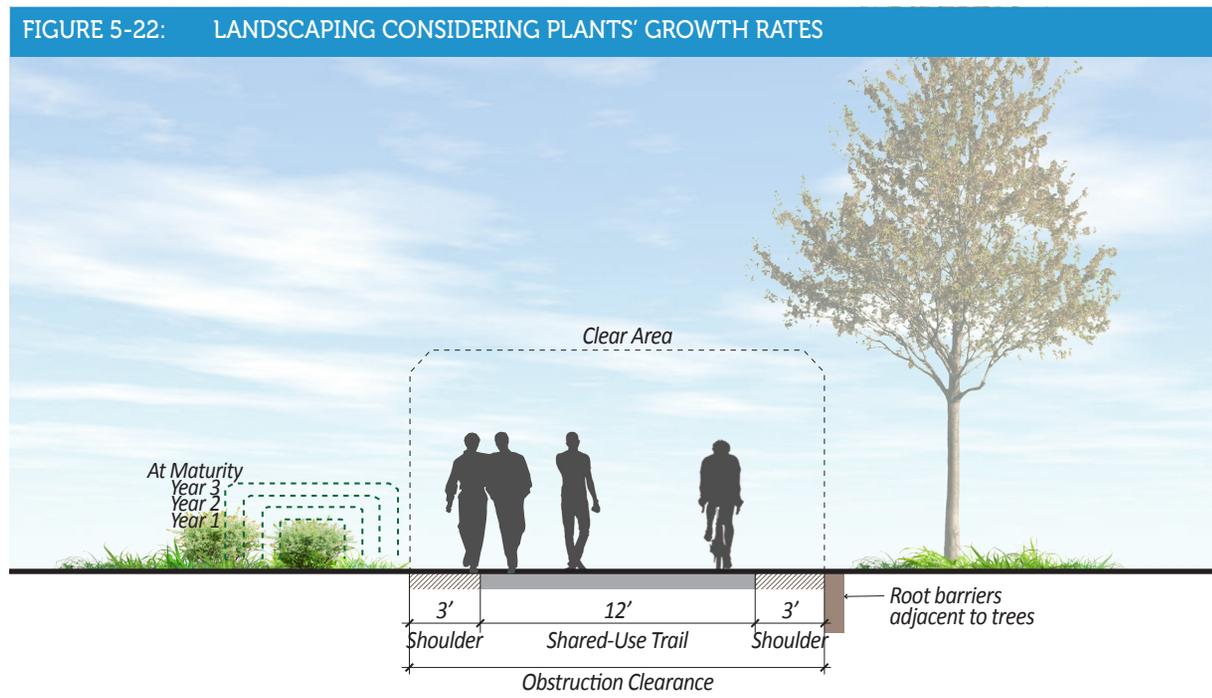
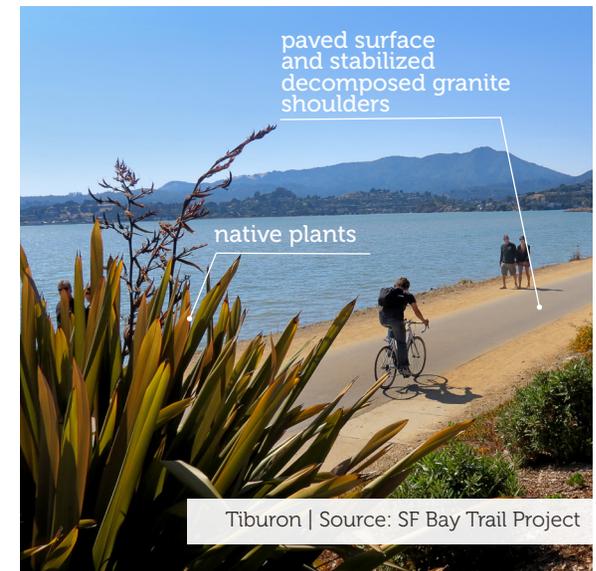
- ▶ Specify site furnishings that are:
 - Durable to minimize maintenance requirements.
 - Composed of recycled, recyclable, reused materials, and/or certified “sustainably” produced lumber where appropriate.
- ▶ Specify energy-efficient lighting suitable for a Bayside environment.

■ **Landscaping**

- ▶ Specify “Bay-Friendly Landscape” materials, particularly mulch to nurture the soil, conserve water, and enhance

wildlife habitat while also protecting the water quality of the Bay.

- ▶ Design trailside landscaping to preserve and dramatize Bay views.
- ▶ Use native plants local to the area that provide habitat for wildlife whenever possible.
- ▶ Select and locate trees and shrubs to reflect their growth rates and sizes as they relate to maintaining the obstacle clearances of the Bay Trail to minimize need for landscape maintenance.
- ▶ When trees are planted near the trail, include root barriers along the edge of the trail shoulder for a distance of 20 feet centered on the tree.

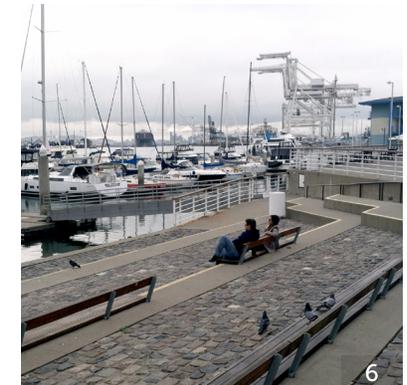


5.10 TRAIL AMENITIES

Specifying trail amenities should involve consistency with the site's characteristics, the managing agency's overall design guidelines, and be appropriate for anticipated levels of use.

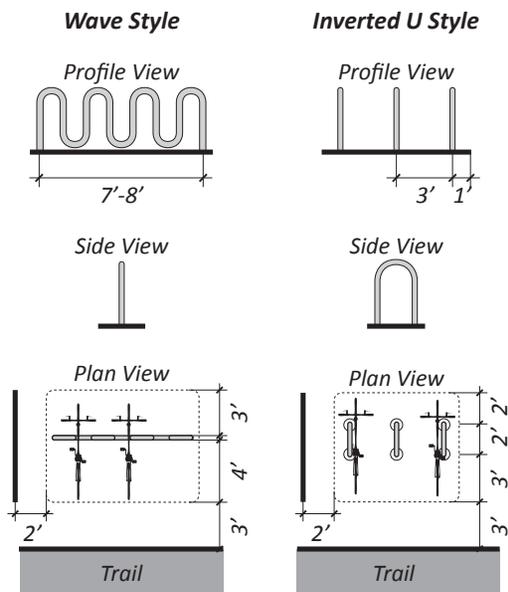
Trailside Seating

- ▶ Assure trail seating is accessible and outside the clear space of the Bay Trail.
- ▶ Orient seating toward Bay views or vistas of opposite shores or landmarks, such as bridges or towers.
- ▶ Provide elevated overlook places to sit away from the trail for viewing the Bay where possible.
- ▶ Provide various seating choices. In addition to fixed benches with and without backs, some seating could be in the form of chairs, picnic tables, retaining walls, planter seats, grass berms, and steps.
- ▶ Consider wind-protected seating where the Bay shoreline setting is often cool and breezy.
- ▶ Locate seating at regular intervals along the trail based on the surrounding environment, land uses, and level of use.
- ▶ Provide shade, or place seating where shade is available.



1. Seating oriented toward Bay views, San Leandro Marina | Source: SF Bay Trail Project
2. Seating in the form of retaining walls
3. Seating and public art, Oakland
4. Benches with shade located outside of the clear space of the trail, Richmond
5. Concrete block seating with Bay views, Jack London Square | Source: SF Bay Trail Project
6. Stair case seating, Jack London Square | Source: SF Bay Trail Project
7. Elevated outlook with benches and binoculars, San Mateo

FIGURE 5-23: BIKE PARKING DESIGN



Bicycle Racks

- ▶ Anticipate the need for bicycle racks or other storage devices particularly where the Bay Trail is associated with parks, other transit facilities or visitor-serving destination points.
- ▶ Assure bicycles attached to bicycle racks are located outside the clear space of the Bay Trail.

Drinking Fountains

- ▶ Provide a source of drinking water at a minimum of 2-mile intervals along the trail where possible. This could be through stand-alone drinking fountains or at convenience stores associated with a marina or other commercial development.

Restrooms

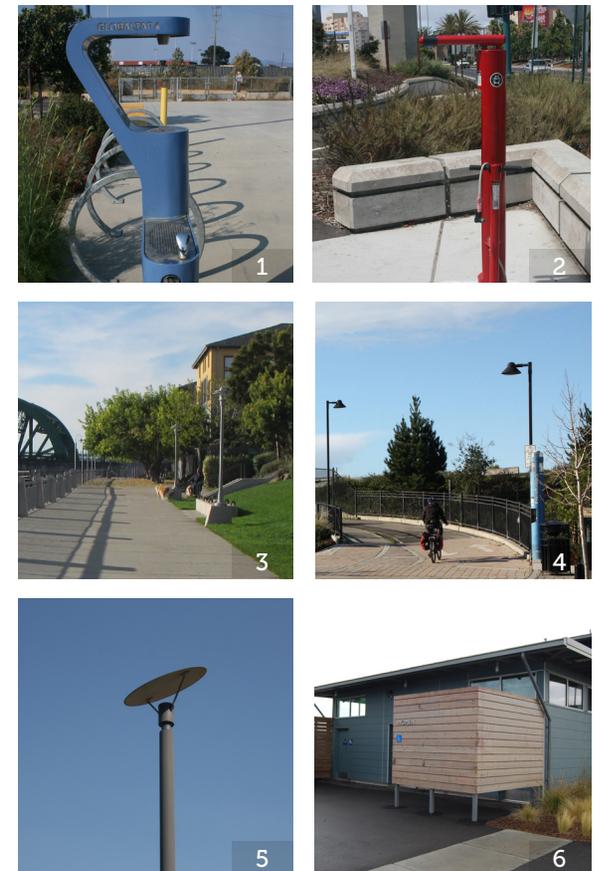
- ▶ Provide restrooms at a minimum of 2-mile intervals along the trail, where feasible and based on the surrounding environment and level of use.
- ▶ Restrooms may be at Bay Trail staging areas, along the trail, or associated with restrooms of other Bayside uses such as at San Francisco Bay Area Water Trail launch locations, ferry terminals, harbor masters, shoreline commercial areas, or parks.

Lighting

- ▶ Provide lighting along the Bay Trail based on the surrounding land use requirements and need for security.
- ▶ Avoid lighting that would conflict with wildlife habitat.
- ▶ Assure that lighting fixtures are located outside the shoulder of the Bay Trail.
- ▶ Use energy-efficient lighting that conforms to the managing agency’s standards including emergency fire egress requirements from nearby buildings as appropriate.

Other Trail Amenity Considerations

- ▶ Where space away from the shoulder of the trail is available on a bridge or trail structure over water, consider providing fishing pole holders on the railing and fish cleaning stations.
- ▶ Additional trail-related amenities may include such items as:
 - Bicycle repair stations at selected locations



1. Water fountain, San Francisco
2. Bicycle repair station, Emeryville
3. Pedestrian-scale lighting near benches, Oakland | Source: SF Bay Trail Project
4. Lighting on the Berkeley pedestrian/bicycle bridge, Berkeley
5. Energy-efficient lighting
6. Restroom near the Bay Trail, Oakland | Source: SF Bay Trail Project

- Trash and recycling containers at trail entrances
- Pet waste stations at trail entrances

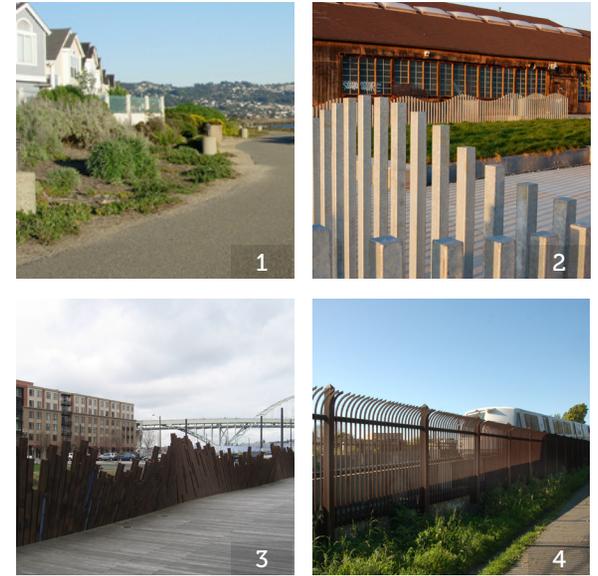
5.11 SECURITY, VANDALISM, AND PRIVACY

A sense of personal safety is important for the Bay Trail user. This generally means being on a trail that is well used, has open visibility, avoids concealed or isolated areas, and may include lighting and/or security cameras. Achieving this goal needs to be balanced with providing security for selected adjacent land uses.

The Bay Trail may pass through or adjacent to any number of land uses that are considered national security risks and are governed by standards and guidelines of the U.S. Department of Homeland Security. The design should create a positive user experience that does not include undue visual barriers for the trail users while maintaining security and privacy for the adjacent land use. Typical trail provisions involve assuring that all trail users stay on the trail, that the adjacent lands

are secure from physical entry, visual intrusions, and protected from objects that may be tossed from the trail. Typical design tools may include providing any or all of the following:

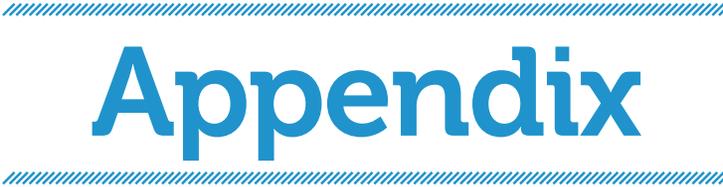
- **Setbacks:** Sufficient horizontal distance between the trail and the secure area so an object could not enter the secure area.
- **Fencing:** High-security fencing where required that is visually pleasing.
- **Visual Barriers:** Screening with fencing systems, walls, or vegetation.
- **Lighting:** Full trail and adjacent area lighting.
- **Camera Surveillance:** 24-hour and full coverage video systems tied either to police departments or the adjacent property owners' security systems.
- **Anti-Graffiti:** Using materials, including plants, to discourage graffiti.



1. Vegetated buffer for privacy, Richmond | Source: Flickr (Joel Williams)
2. Decorative fence, Oakland
3. Wooden fencing
4. Security fencing

FIGURE 5-24: BUFFER DESIGN OPTIONS





Appendix

ADDITIONAL STANDARDS AND GUIDELINES APPLICABLE TO THE BAY TRAIL

Though not exhaustive, the following references when used in combination with standards and guidelines of local jurisdictions and managing agencies, provide the trail designer with more information about many of the topics covered in the Bay Trail Toolkit.

FEDERAL

U.S. Access Board. *ADA Accessibility Guidelines (ADAAG); ADA Standards for Transportation Facilities; Architectural Barriers Act Accessibility Guidelines; 2010 ADA Standards for Accessible Design.*

This publication provides standards and guidelines for making routes of travel accessible under Federal law. Particularly important to the Bay Trail are requirements for ramps associated with bridges and undercrossings. All standards should be met by the Bay Trail system.

U.S. Access Board. *Architectural Barriers Act Accessibility Guidelines; Outdoor Developed Areas. 2013.*

The Guidelines identify technical requirements for camping facilities, picnic facilities, viewing areas, trails, and beach access routes. For the Bay Trail, these guidelines involve sites around the Bay owned, managed, or funded by the federal government or other agencies that have adopted the guidelines.

STATE

State of California Department of Transportation. *California Highway Design Manual, Chapter 1000 — Bikeways. Current Edition.*

This chapter of the Highway Design Manual provides mandatory standards, advisory standards, permissive standards, and general design guidance and safety recommendations for shared-use bicycle paths, also referred to as Class I bikeways, as defined in subdivision (a) of Section 890.4 of the Streets and Highways Code. The standards and guidelines are typically referenced for the State's own bikeway projects, transportation projects of local agencies, and projects involving federal or state transportation funding.

State of California Department of Transportation. *California Manual on Uniform Traffic Control Devices. Current Edition.*

The manual provides uniform standards and specifications for all official traffic control devices, in accordance with Section 21400 of the California Vehicle Code. The State's guide to all signage and pavement markings is applicable to streets and highways, including bicycle paths and the Bay Trail.

State of California Department of Transportation. *Design Information Bulletin Number 89: Class IV Bikeway Guidance. December, 2015.*

The memorandum provides design criteria and guidance about best practices related to separated bikeways.

San Francisco Bay Conservation and Development Commission. *Shoreline Spaces Public Access Design Guidelines for the San Francisco Bay. April, 2005.*

This publication provides general planning principles, objectives, and examples of site-specific improvements related to public access along the shoreline of the San Francisco Bay that would include and/or affect a Bay Trail design.

San Francisco Bay Conservation and Development Commission. *Shoreline Plants – A Landscape Guide for the San Francisco Bay. March, 2007.*

This publication provides an overview applicable to the Bay Trail of objectives for how plant materials can improve habitat, improve the public's experience of the Bay, and stabilize the Bay's shorelines. It identifies plant communities native to the Bay and its margins, typical landscapes of today, appropriate plant lists for use, and identifies plants that should not be used.

San Francisco Bay Conservation and Development Commission. *Shoreline Signs – Public Access Signage Guidelines. August, 2005.*

This handbook provides detailed guidelines for signs used at public access areas that are part of development projects along the shoreline of the San Francisco Bay.

OTHER

American Association of State Highway and Transportation Officials (AASHTO). *Guide for the Development of Bicycle Facilities*. Current Edition.

This publication is a comprehensive national guide providing detailed design information on how to accommodate bicycle travel and operations in most riding environments.

National Association of City Transportation Officials (NACTO): *Urban Bikeway Design Guide*. Current Edition.

This national publication provides guidance for on-street bicycle facilities, including separated bikeways that exclude pedestrians.