Final Report
Bay Trail Feasibility Study

prepared for the

City of Menlo Park

January 6, 2005

funding assistance provided by
San Francisco Bay Trail,
a project of the Association of Bay Area Governments and
the Coastal Conservancy

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Callander Associates Landscape Architecture, Inc.
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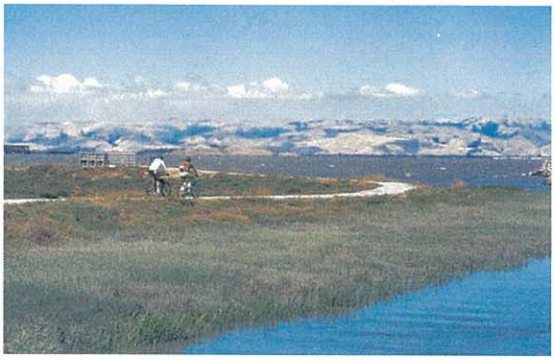
Introduction

The San Francisco Bay Trail is a planned recreational corridor for hikers, joggers, bicyclists, skaters, and nature enthusiasts. Once completed it will total 500 miles of trail that connect the nine Bay Area counties as a "ring around the Bay." Currently over 253 miles of the regional trail are complete.



SF Bay Trail Palo Alto (top)
SF Bay Trail at Ravenswood Open Space Preserve (bottom)

Three main goals of the San Francisco Bay Trail include the intent to:

- provide connection to existing park and recreation facilities
- create links to existing and proposed transportation facilities
- be planned in a manner to avoid adverse effects on environmentally sensitive areas

This report defines, focuses and illustrates several conceptual trail alignments to complete a 1/2 mile trail reach in the Menlo Park and East Palo Alto area. While only a short distance, this project area contains a diverse area of land uses and infrastructure, rich in planning history, and current environmental cleanup helping to restore and reestablish native wetlands habitat.

This trail link will connect the Ravenswood Open Space Preserve and an existing bicycle pathway to University Avenue near the Southern Pacific Railroad (SPRR). A longer term goal sought to look at the connection of the Ravenswood neighborhood to the existing pathway to Bayfront Expressway near the Dumbarton Bridge overpass, via a "bay connection". More recent maps of the overall Bay Trail alignment provided by ABAG and information received from regulatory agencies conclude that some means of public access, more likely a point connection and not a through trail connection, is more likely scenario for this longer term goal. This Bay Trail Feasibility Study originally sought to determine one acceptable trail alignment concept for all stakeholders to agree on this, including the Association of Bay Area Governments (ABAG), City of Menlo Park, the City of East Palo Alto, the County of San Mateo, the San Francisco Water Department, SamTrans and the Peninsula Joint Powers Board, and the Mid-peninsula Open Space District. Due to the current planning efforts of several stakeholders, environmental issues, and other constraints, no single feasible alignment became apparent until the close of the Feasibility Study planning process. Instead, several conceptual trail alignments

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or reaches were proposed to help determine a preferred trail alignment. These concept alignments are found in the Supplement document, which is separate from this Final Bay Trail Feasibility Study. From public input, Transportation Commission recommendations from the City of East Palo Alto and East Palo Alto City Council, and recommendations of the Bicycle Commission of the City of Menlo Park and Menlo Park City Council, the trail concepts were ranked in preference. Only one Bay Trail Preferred Alignment was identified of the four concepts presented, exclusive of the Future Bay Trail spine and/or spur connection. No other Bay Trail concepts (Neighborhood Alignment; Neighborhood Alignment Option; Bay Trail Option 1: option 1 or option 2) were approved. The Preferred Alignment, identified as Bay Trail Option 2, requires additional stakeholder planning issues and environmental issues to be resolved prior to proceeding with trail planning.

Planning Process

The San Francisco Bay Trail is a regional corridor and will be a local link between Menlo Park and East Palo Alto. This regional trail is popular with recreational users, commuters, and educators to explore and appreciate the Bay habitat and wildlife, while also respecting sensitive habitat areas. Since the early 1990's, the County of San Mateo, the San Francisco Water Department, the Peninsula Joint Powers Board, the Midpeninsula Open Space District, the City of East Palo Alto, and the City of Menlo Park have participated in regional planning efforts to develop this uncompleted segment of the San Francisco Bay Trail. The Association of Bay Area Governments (ABAG) provided grant funding to the City of Menlo Park to plan for this trail reach.

Lead by the City of Menlo Park staff, with oversight from ABAG, the consultant team of Callander Associates, Dana Bland & Associates, and Alta Planning + Design worked in collaboration with Task Force members, stakeholders, the City of East Palo Alto staff, the community (both Menlo Park and East Palo Alto), regulatory agencies, and other governmental departments throughout the process.

The planning process included a Task Force committee of stakeholders, including ABAG staff, SamTrans, Caltrans, San Francisco Public Utilities Commission, Cargill, Pacific Gas and Electric, C/CAG San Mateo County, San Mateo County Trails Committee, Midpeninsula Regional Open Space District, Bay Conservation and Development Commission, Peninsula Bicycle Pedestrian Coalition, General Public and Bicycle Advocate, Menlo Park and East Palo Alto staff, community members, recreational users, a biologist, landscape architects and planners. Valuable technical input and current site planning efforts were gathered on the project before relaying the information to the community. The goal of the meetings was to gather insight and feedback of the trail alignments and design. Input from the community was gathered at a public workshop and through questionnaire response mailed to over 250 local residents. Task Force members were also invited to the public workshop. Meeting minutes are included in the Supplement document for reference.

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Introduction

Study Overview

This Feasibility Study includes the preferred plan, a cost evaluation for the Preferred Alignment, railroad operation issues, an action plan, and potential funding sources. It presents a Preferred Plan and section drawings that are intended to illustrate conceptual ideas of how the trail might be developed. The drawings are for illustrative purposes only and do not represent requirements of the City of Menlo Park, the City of East Palo Alto, or stakeholders.

This study will be a stepping stone towards advanced trail planning, stakeholder collaboration, fundraising strategies, construction documents and actual construction of the trail. As you will see the study will lay out an action plan for future efforts. As current related planning efforts in the rail corridor area crystallize and a more precise alignment is agreed upon, the plan outlines some of the major steps required to make the trail become a reality.

Bay Trail Types

There are three main trail types that are associated with the San Francisco Bay Trail: the spine, the spur trail, and the connector. The spine is the main continuous Bay Trail route. Spur trails extend from the spine trail to shoreline points of interest or habitat viewing areas. Connector trails extend from the spine trail to neighborhood communities, business areas, commercial centers, and transit hubs, etc. The Draft Feasibility Study originally proposed two neighborhood trail options as alternatives to the "spine" trail, two Bay Trail "spine" options, and a future "spur" and/or "spine" trail. These are illustrated and described in more detail in the Supplement document. This Final Bay Trail Feasibility Study illustrates only one Bay Trail "spine" trail and a future "spur" and/or "spine" trail, that were identified as the preferred concept alignments.

In this report, the term "San Francisco Bay Trail" refers to the whole regional corridor. The terms "proposed Bay Trail" or "proposed trail reach" refer to the proposed 1/2 mile concept alignment(s) to complete this local and regional trail gap.

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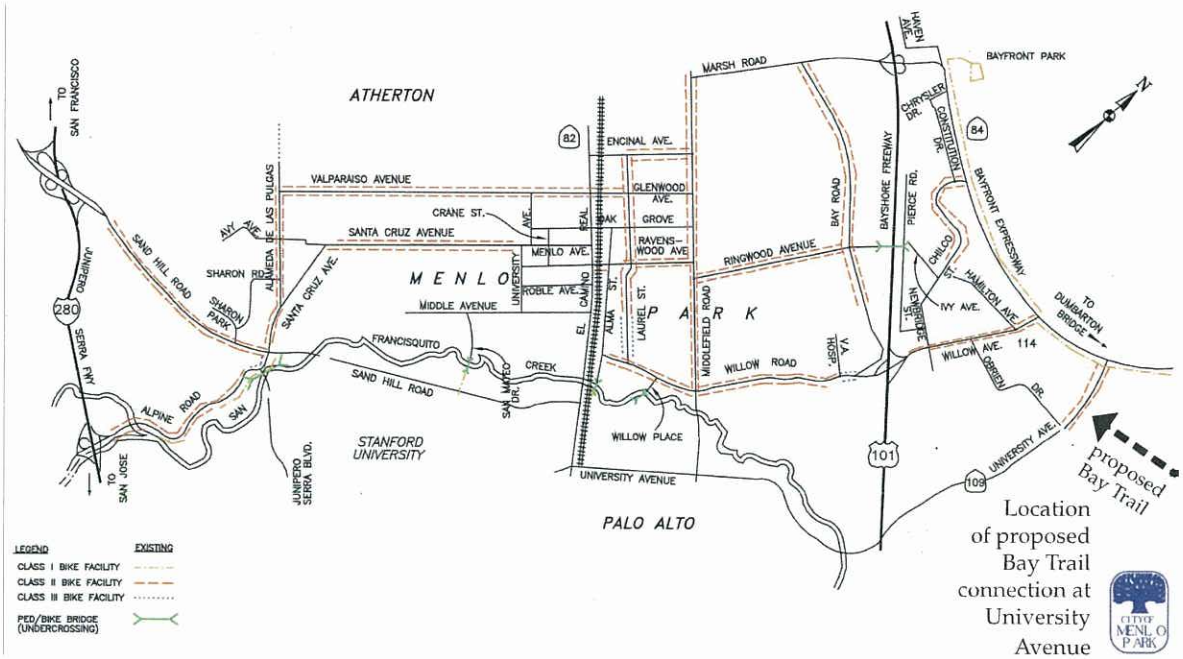
Introduction

Existing Conditions

This proposed trail reach of the San Francisco Bay Trail is located in San Mateo County, respectively in the both the City of East Palo Alto and the City of Menlo Park. To date, this is the only known precedent of a Bay Trail reach that includes the jurisdictions of two separate cities. The city limit line, illustrated on the Preferred Plan, runs north along University Avenue, turns east and runs south and parallel to the existing rails, and jogs south again through the wetland areas of the Ravenswood Open Space Preserve. To the east, the San Francisco Bay Trail stops at the Ravenswood Open Space Preserve. This open space is accessible via Bay Road and terminates at Cooley Landing. There is a trail head and parking area for the open space. To the west, there are Class II bicycle lanes along both shoulders of University Avenue, a main arterial street through East Palo Alto to Highway 101 and downtown Palo Alto. University Avenue also connects nearby to an existing Class I multi-use trail on either side of the Bayshore Expressway (84) and the Dumbarton Bridge.



Bicycle Related Improvements Plan
(with note regarding location of proposed Bay Trail concept connection per Callander Associates)
City of Menlo Park, Transportation Division
updated December 1999, based on Figure II-4 and Figure II-1 of Menlo Park General Plan 1994

Note: since the creation of this map, the following improvements have been completed in the immediate area of the Bay Trail concept connection:

- *Class II bicycle lanes have been installed along University Avenue connection to 84*
- *Class I multi-use trail(s) has been installed along 84 as illustrated...this is the Bay Trail*

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The local area has diverse land use and currently has several private and regional planning projects underway on individual parcels. The surrounding land uses include regional open space preserve, wetlands habitat, industrial use, proposed multi-family housing, existing single family residential, an elementary school, several utility easements and built infrastructure, inactive rail lines, salt pond restoration and environmental cleanup, an arterial street (University Avenue), and an interstate (84). Each varied land use is owned by a unique property owner.

Other local planning efforts include the Cargill Salt Ponds and the Dumbarton Rail Corridor, owned by the San Mateo County Transit District (SamTrans). Throughout this document the Dumbarton Rail Corridor is referred to as SPRR. The corridor links Redwood City and Newark. Currently there is one inactive rail line that crosses perpendicular to University Avenue and extends across the Bay via a rail bridge. These rails are being considered for re-activiation and improvements for commuter train use. This right of way and re-activation of the rails would have impacts on proposed Bay Trail reaches. Safety, security, accessibility for trail users and rail maintenance equipment are major concerns of the rail owners. Also due to the unknown alignment of the rails, it is difficult to identify safety buffer distances from the active rail lines at this time. SamTrans, the property owner, is currently in the preliminary planning stages for the rail activation. The railroad reactivation has priority for development over the Bay Trail on this parcel.

The Cargill Salt Ponds cover the largest parcel area between the rail line and Highway 84. A portion of this area is in the process of environmental cleanup from a prior gun shooting range and salt pond evaporation. There are three phases of cleanup that include the off hauling of debris, including lead shot, desalinating the salt pond slough, and restoring wetlands habitat. The cleanup is estimated to be completed in 2005, with planning efforts for future land use in the very preliminary phase. This land owner does not want to limit their future land use with a built trail, before their site planning is complete. Currently the site has existing paved service roads that are gated, and not accessible to the public. Use of this site from the Ravenswood neighborhood area would involve an at grade rail crossing, which is an accessibility and safety concern. The Cargill site has a potential to provide for a long term Bay Trail spine and/or spur trail to the existing trail head near the pier, at the Dumbarton Bridge overcrossing.

SF Bay Trail towards the Wellington Corporation site

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Introduction

To connect the trail from Ravenswood Open Space Preserve to University Avenue, some wetland areas have to be crossed. A bridge or boardwalk system is needed to cross from the open space towards the Ravenswood or railroad areas. Potential trail easements, land acquisition, and collaboration with stakeholder planning efforts will also need to be further explored. Neighborhood streets that dead end to the Bay side have the potential to provide connections to the Ravenswood neighborhood.

Connections from Bay Road and the Ravenswood Open Space Preserve though to University Avenue would provide commuter bicyclists, recreational users, school groups, and neighbors with access along the Bay's openspace.

Multi-use Trail along Highway 84, towards Dumbarton Bridge east bound

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Planning Process

This chapter summarizes key events of the planning process. The process included Task Force meetings, public outreach, regulatory agency input, and City Council meetings at both the City of Menlo Park and the City of East Palo Alto. Detailed meeting minutes are included in the Supplement document.

Task Force

A Task Force was formed specifically for this project with members from key stakeholders, City and County government staff, open space advocates, bicycle advocates, trail planners, utility agencies, and others. Three Task Force meetings were held to gather technical information for the project, provide feedback on proposed trail alignments, and review information before it was presented to the community. Members included participants from the following organizations:

Association of Bay Area Governments (ABAG)
City of Menlo Park
City of East Palo Alto
SamTrans
Caltrans
San Francisco Public Utilities Commission (SFPUC)
Cargill
Pacific Gas and Electric (PG&E)
C/CAG San Mateo County (C/CAG)
San Mateo County Trails Committee
Mid-peninsula Regional Open Space District
Bay Conservation and Development Commission (BCDC)
Peninsula Bicycle Pedestrian Coalition
General Public and Bicycle Advocate
Callander Associates Landscape Architecture, Inc.
Alta Planning + Design

Task Force Meeting #1 May 15, 2003

This was a kick-off meeting to introduce committee members to the project and to gather information about specific site areas, planning efforts of the agencies, and goals of the trail connection.

Site Visit June 18, 2003

A site visit was held to tour both the Peninsula Corridor Joint Powers Board property along the existing railroad tracks, and the San Francisco Public Utilities Commission site containing the Hetch Hetchy Pipeline and the Cargill salt ponds Members of the Task Force, Callander Associates, Alta Planning + Design, and Dana Bland the project's biologist attended the site visit. Comments from stakeholders including efforts of previous planning projects, site history, concerns about public accessibility, locations of existing utility infrastructure, current environmental cleanup, and salt pond restoration were discussed. Site photographs were also taken and are included in the Appendix.

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Planning Process

Draft Alignment Concepts Meeting August 25, 2003

Callander Associates met with several members of the City of East Palo Alto to discuss the trail project and any opportunities and constraints that they may foresee. Items discussed included current arsenic cleanup along the border between private residences and the Ravenswood Open Space Preserve, on going planning and redevelopment efforts of the Ravenswood Business District, traffic calming efforts along Fordam Street, funded bicycle improvements to be implemented along Bay Road, community garden sites, and property ownership status and easements along the marshlands was discussed.

The City of East Palo Alto was open to this planning process and would like to see potential improvements integrated with current redevelopment and environmental cleanup efforts. Providing safe access, creating trail amenities, promoting design that fosters police patrolling, limiting opportunities for undesired activity, and encouraging pedestrian and bicycle use along the Bay were issues shared in interest. Community and City Council input was desired for further development of trail concepts.

Task Force Meeting #2 November 5, 2003

The *Existing Conditions Report*, dated September 5, 2003, was delivered to committee members prior to this meeting. This report included site photos, a biology report, property information, and a concept plan diagram illustrating four proposed alignments. At this session, comments were received on this report. Following the meeting, revisions were made to the alignments to identify proposed neighborhood trail alignment options, proposed Bay Trail reach options, and a future trail spur and/or spine.

Public Workshop February 26, 2004

The intent of the workshop was to gather feedback from the community on the refined Opportunities Plan diagram. This same diagram is illustrated in this report. Background information, site photos, proposed conceptual sections of typical trail segments, and the Opportunities Plan, were presented. Input was gathered from the workshop. Due to the lower than anticipated attendance of the meeting, a questionnaire was developed for further public outreach.

Questionnaire Spring 2004

A user survey, 250 copies total, was distributed to the community and neighborhood centers in the area of the Bay Trail reach. This was a tool that sought additional input form the public who might not have been able to attend the public workshop. Questions were asked about past and anticipated use of the San Francisco Bay Trail, anticipated method of travel to the proposed trail, desired amenities, and preferred trail alignments.

Responses were received from eight San Francisco peninsula residents, many of whom visit or commute to the Menlo Park and East Palo Alto area frequently. The results revealed that Bay Trail use was desired for day and weekend use for recreation, bicycle

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commuting, and environmental education opportunities. Trail amenities such as trail maps, regulatory signage, and interpretive signage were requested. It was also desired to have respectful construction practices that don't impede on sensitive habitats and species, preferring a trail that provided a "bay experience" as opposed to an urban one.

Regulatory Agency Input Spring 2004

Information from the public workshop presentation and the *Existing Conditions Report,* were presented to several regulatory agencies for preliminary planning review. This was to help identify any red flags that the proposed alignments may present, gather input on preferred trail alignments for incorporation into the Action Plan, and obtain feedback on any other actions or information that may be needed for future implementation of a trail reach. The regulatory agencies included:

- United States Army Corps of Engineers, Regulatory Branch (USACE)
- United States Department of Fish and Wildlife (USFW)
- California Department of Fish and Game
- San Francisco Regional Water Quality Control Board (SFRWQCB): San Mateo and Santa Clara Counties
- Bay Conservation and Development Commission (BCDC)

Information regarding permitting processes, additional request for habitat maps due to unknown areas of sensitive species and habitat, and preferences for trail options were given.

Joint Task Force Meeting #3 and Menlo Park Bicycle Commission Mtg. July 8, 2004

This meeting was held to discuss the Draft Bay Trail Feasibility Study, gather feedback, any revisions, and direction to proceed prior to presenting the project to the City of East Palo Alto Council. It was also asked of the concept alignments should be prioritized. Also at the meeting, it was determined that the concepts should also be presented the City of East Palo Alto Transportation and Bicycle Commission, prior to the City of East Palo Alto City Council. The report will then be finalized after presentation to the City of East Palo Alto City Council and the City of Menlo Park City Council. No quorum was available at this meeting to make recommendations.

Menlo Park Bicycle Commission Meeting July 21, 2004

On follow up of the prior Commission meeting, discussion of the four concept alignments and the draft report was continued. Because at this time not a single best alignment was identified, the four concept were presented with trade-offs. Unanimous support was given to complete the Bay Trail project and the draft report was accepted.

East Palo Alto Transportation and Bicycle Commission Meetings September 9, 2004
October 6, 2004

Two commission meetings address the Bay Trail Feasibility Study. Callander Associates presented the concept trails and answered questions from the public and the Commission

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at the first meeting. Map orientation and trail locations were clarified. Concerns for safety, access from outsiders, reallocation of private residential property (the railroad and utility easement), neighborhood separation, and rail reactivation were discussed. The second meeting determined consensus only on one trail, Bay Trail Option 2 (the yellow trail), for recommendation to the East Palo Alto City Council.

East Palo Alto City Council Meetings October 5, 2004 and October 19, 2004
A Draft Feasibility Study and a staff report were given to Council prior to the meeting. The first meeting was an informational meeting, opportunity for questions, and public comment session. The second meeting, with recommendation of the preferred alignment from the Commission, was an action on the approval of the Bay Trail project. The Commission recommended concept alignment was viewed at the least evasive to adjacent residential property owners and provided the greatest "Bay experience" of all four concepts presented. Council is in support of the Bay Trail project, unanimously approving Bay Trail Option 2, as the only allowable concept Bay Trail alignment.

Menlo Park City Council Meeting November 16, 2004
The final public meeting for this project, the Bay Trail project appeared on the Consent agenda for the Council. A Draft Feasibility Study and staff report were presented to each Council member prior to this meeting. Clarification on the city limits and the rationale for determining a preferred alignment at this preliminary level of property and environmental understanding were discussed. Identifying a preferred alignment provides a clear focus for future Bay Trail and affected property owner planning efforts in the future, and helps to identify potential grant funding sources for implementation. In support of the city's neighbor, the City of East Palo Alto, staff's recommendation of the trail for cost evaluation and "Bay experience" as well, the Council unanimously approved concept trail Bay Trail Option 2 as the Preferred Alignment, excluding the other three alignments.

Summary
Information from these subsequent meetings, site visit, public workshop, questionnaire responses, and subconsultant review, are summarized in the following Preferred Plan diagram that illustrates proposed Preferred Alignment concept trail and the future trail. More detailed and referenced background information, including *Legal and Management Issues, Biological Resources* and *Property, Site Issues* (photo log), and *Opportunities Plan* illustrating all draft report concept trail alignments may be found in the Supplement document.

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Preferred Plan

The Preferred Plan, depicted in this chapter, illustrates the vision generated from the Task Force collaboration, agency feedback, community input, City guidance, and Council approval. The proposed alignments close the gap from the San Francisco Bay Trail at the Ravenswood Open Space Preserve to Class II bicycle lanes at the shoulders of University Avenue. A new sidewalk is proposed along the east side of University Avenue between Purdue Avenue and Highway 84 to complete the pedestrian connection.

A future Bay Trail connection or spur trail is desired along the Bay to an existing trail head at the Dumbarton Bridge overpass (84). The proposed concept Preferred Alignment is graphically illustrated in the Preferred Plan and described narratively in this chapter. Respective concept sections for typical trail segments are also illustrated.

The concept Preferred Alignment and future Bay Trail connection and/or spur trail include the following reaches described from the San Francisco Bay Trail at the Ravenswood Open Space Preserve:

- **Preferred Alignment** (formerly Bay Trail Option 2): a shoreline spine (alternate). Proposed bridge over wetlands area, proposed raised boardwalk over wetlands area and parallel to SPRR lines, between service road and railroad to University Avenue.
- **Future Trail Spur and/or Spine**: a future spur and/or spine (long term alignment); connects to Bay Trail Option 2 or just provides a point connection (similar to a pier) at the Bay's edge near the Dumbarton Bridge overpass. From Rutgers Street neighborhood connection, across the service road, at grade railroad crossing, on top of existing service road, trail split to travel southeast on top of service road to University Avenue, north east trail split to travel on top of existing service road, to proposed new trail on top of raised levee (around the Cargill Salt Ponds), to the existing trail head and parking area at the Dumbarton Bridge overpass (84).

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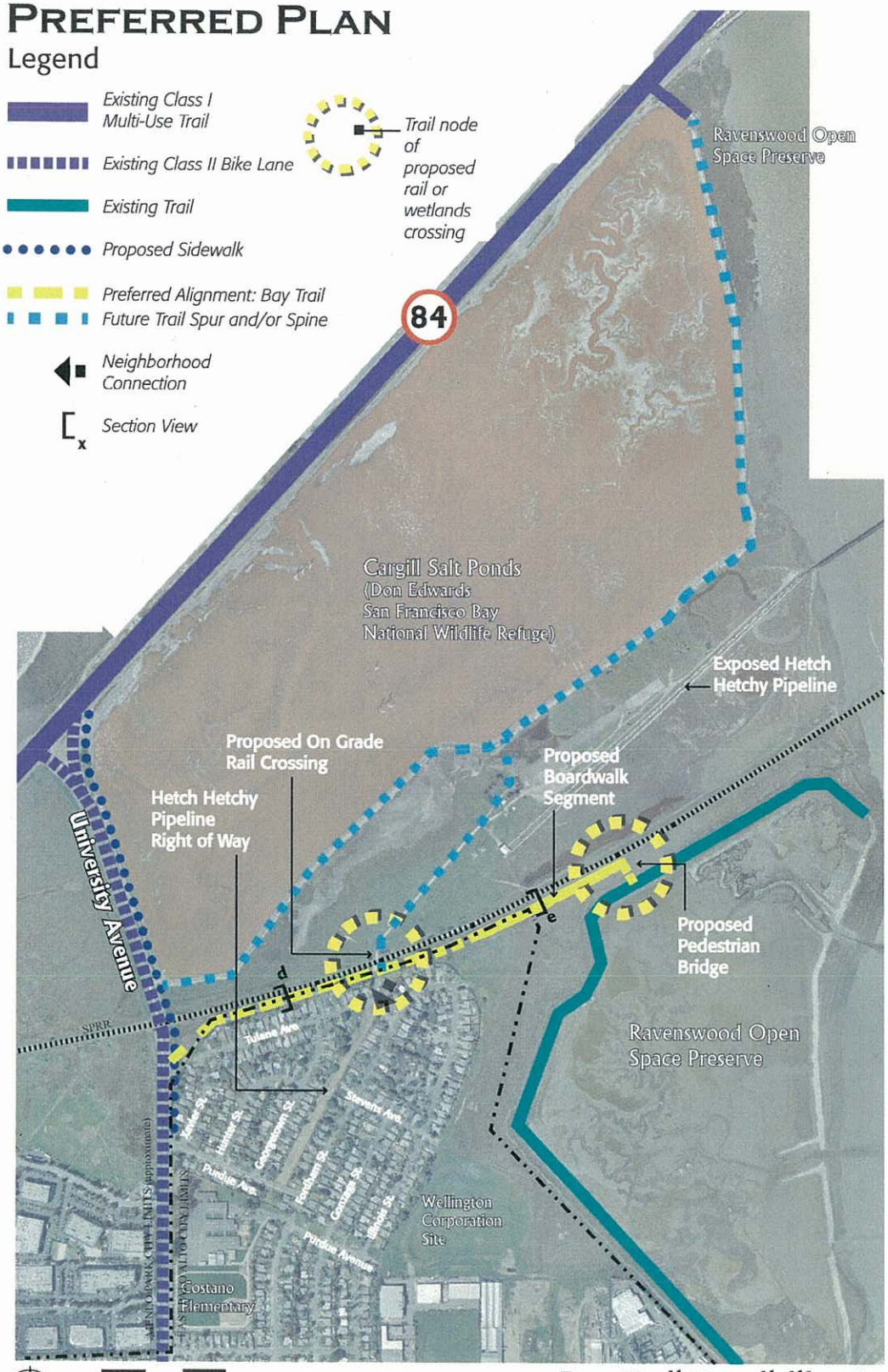
PREFERRED PLAN

Legend

- Existing Class I Multi-Use Trail
- Existing Class II Bike Lane
- Existing Trail
- Proposed Sidewalk
- Preferred Alignment: Bay Trail
- Future Trail Spur and/or Spine
- Neighborhood Connection
- Section View
- Trail node of proposed rail or wetlands crossing



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Bay Trail Feasibility Study
City of Menlo Park
November 24, 2004

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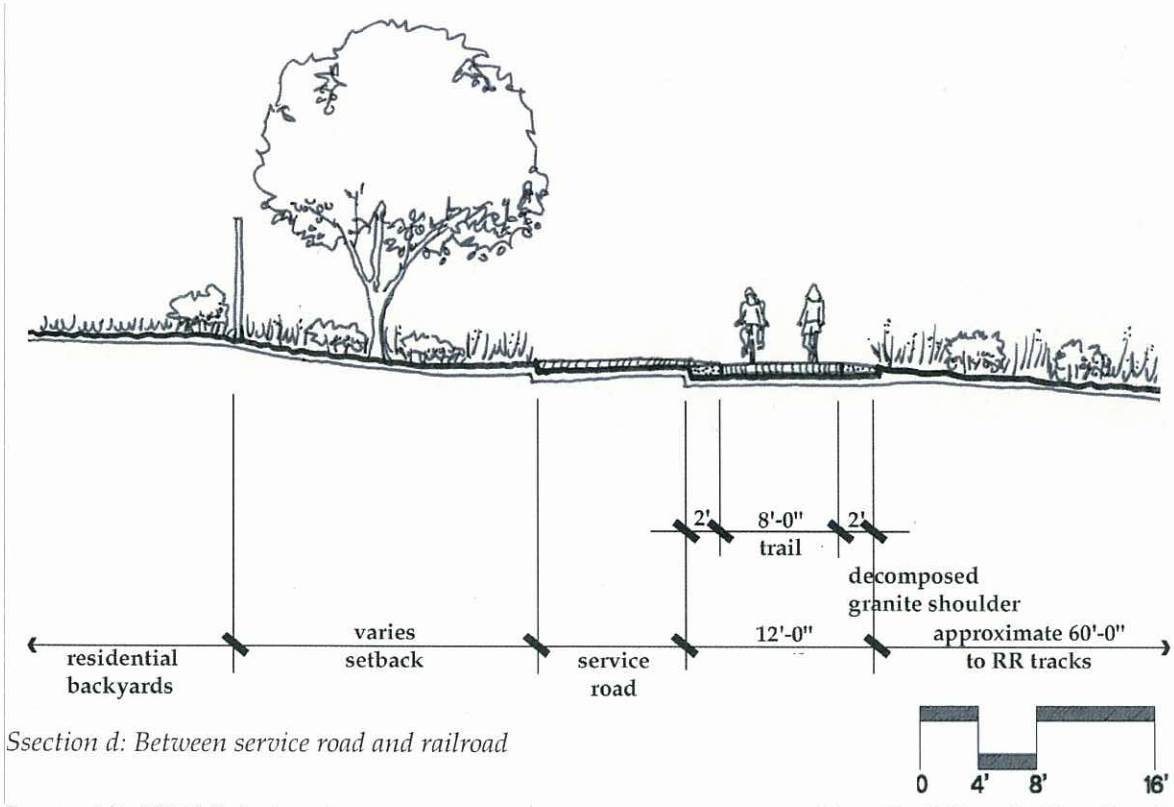
Preferred Alignment (Bay Trail Option 2)
The Preferred Alignment Bay Trail illustrated in the yellow dashed line, takes advantage of the Ravenswood Open Space Preserve trail proximity, crossing towards the rail lines directly via a new pedestrian bridge. This concept incorporates the longest length of existing Ravenswood Open Space Preserve trail. The rail is currently non-active though future planning efforts seek to re-activate and add an additional parallel rail line for commuters. A second rail line would increase the right of way width and its needed buffer zone for safety and maintenance access. With the two proposed rail alignments, the southern track would be approximately 7.5 (to the south) from its current location. This future rail narrows the options for placing a Class 1 trail in its proximity and seeks a challenging process to have a rail with trail. For the trail to run parallel with the tracks, the trail would most likely be in a wetlands area. This environmental impact of a new structure would require extensive permitting and potentially expensive boardwalk structure. Further design

Service Road looking eastbound



Ssection d: Between service road and railroad

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guidelines are recommended in the following chapter, entitled Railroad Operation Issues, to address rail-with-trail design considerations and suggestions for setback distances buffering, and crossing signalization.

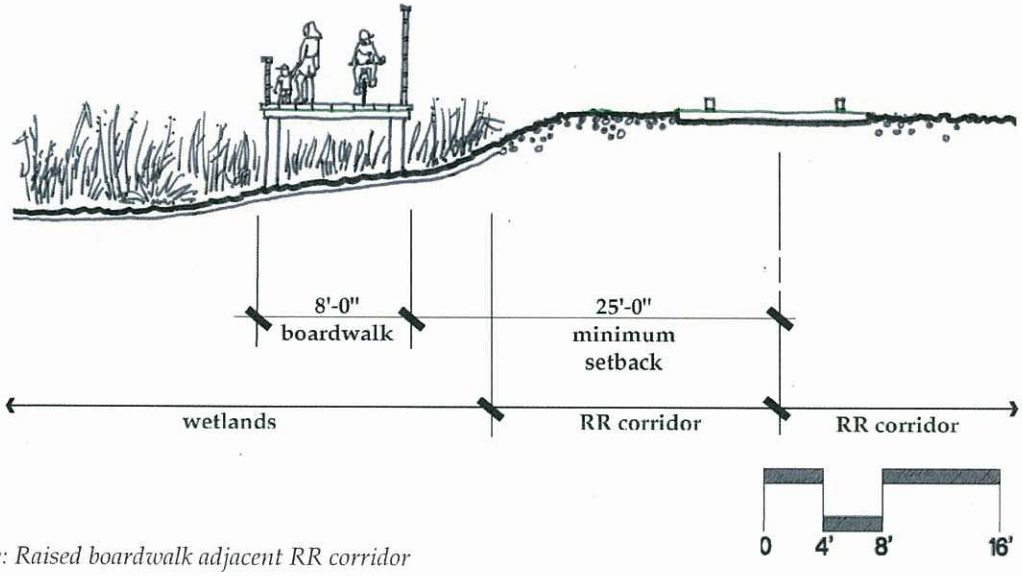
If the trail and rail proximity were able to be safely and feasibly addressed at this juncture, the trail would then travel near the rear of the existing residential properties. This segment of the trail would be juxtaposed between the existing paved service road and the railroad, see Section d. This road is used occasionally by maintenance trucks. The proposed Bay Trail connection would then meet with University Avenue.

It should be noted that the United States Fish and Wildlife Service has expressed some concerns about this alignment. The Cargill Salt Pond area was acquired by the Service from Cargill Salt as part of a 16,500 acre purchase. Efforts are underway to identify former salt pond areas for restoration for tidal marsh habitat. This alignment may constrain or restrict future habitat restoration options between Ravenswood Open Space Preserve and the Cargill Salt Pond area, salt pond SF2. A letter from USFWS regarding this concern is included in the Supplement document.

View east at railroad, Ravenswood Open Space Preserve seen on right

Future Trail Spur and/or Spine

This proposed Future Trail Spur and/or



Ssection e: Raised boardwalk adjacent RR corridor

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Spine, illustrated in an teal dashed line, connects many of the proposed Bay Trail and Neighborhood Alignment alignments with the existing staging area at the Dumbarton Bridge underpass (84). This route travels via the Cargill Salt Pond area. This is a longer trail segment that proposes an at-grade rail crossing near the Ravenswood residential area. Accessibility, security, and safety of allowing public use are concerns of the rail property owners.

From the rail crossing, the trail then enters SFPUC property and roughly follows the alignment of the existing service road and connects to the existing salt pond levee. The levee trail would then split with one path connecting to University Avenue, on the western side of the rail tracks, and one connecting to the trail head at Bayfront Expressway (84) near the Dumbarton Bridge underpass. Overall, this trail alignment would provide the closest proximity to the San Francisco Bay itself, compared to other reaches proposed in this study. This alignment circumnavigates the salt pond on top of an existing raised levee. Future restoration of the salt ponds may require temporary flooding and a new bridge may be needed at the levee break. A permit was just obtained from the San Francisco Bay Regional Water Quality Control Board to open the saline ponds to the tides. The efforts to restore the salt ponds to native habitat are still underway and may take several years.
Due to the near proximity of the Bay, this trail alignment would provide a "bay" experience. This trail has several constraints due to environmental clean up efforts, proximity to regional utility infrastructure, crossing of potentially active rail lines, and potential for sensitive habitat in the project area. While the Preferred Plan illustrates a spine trail that connects from the Ravenswood neighborhood area to Highway 84, a shorter, spur trail may be more feasible.

BCDC and the USFWS have expressed more concerns about this alignment, compared to other proposed alignments in this study. The United States Fish and Wildlife Service prefers this alignment less than the Preferred Alignment (Bay Trail Option 2). The Cargill Salt Pond area was acquired by the Service from Cargill Salt as part of a 16,500 acre purchase. Efforts are underway to identify former salt pond areas for restoration for tidal marsh habitat. This alignment proposes to circumnavigate the Cargill Salt Pond area, specifically Pond SF2. The location of this alignment would severely hinder environmental restoration. A letter from USFWS regarding this concern is included in the Supplement document.
BCDC also expressed concern about this encompassing trail. Their concerns are similar to those of the

Raised levee looking eastbound

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USFWS. The intent of the area is to restore the wetlands and find a balance between habitat and public access. The restored Cargill Salt Pond area will be added to the Don Edwards San Francisco Bay National Wildlife Refuge (the Refuge). A collaborative effort of the City(ies) and the Refuge to establish a trail alignment. A point connection, or "dead end" trail, would be preferred over a trail that surrounds the pond area. BCDC has environmental requirements for obtaining a BCDC permit for the trail that should be followed.

Summary

The Bay Trail Preferred Alignment is not anticipated to be implemented in the near term, but is one step closer to possibly being implemented. The Action Plan outlines the anticipated steps needed prior to the implementation and construction of the trail. This includes the completion of land planning efforts of stakeholders, including the plans for the Dumbarton Rail Corridor Plan, and environmental planning issues, such as habitat mapping for sensitive species and neighboring Cargill Salt pond wetland restoration efforts. The continuation of Bay Trail planning efforts for this reach should seek to work as a partnership with current land planning activities of stakeholders and maintain an ongoing dialog, respecting ongoing planning projects as a priority to that of the Bay Trail. This dialog should be fostered and maintained with stakeholders in order to help further the implementation of the Bay Trail Preferred Alignment and Future Trail, when the timing is appropriate and possible, given environmental CEQA review, regulatory permitting, sufficient funding, and the like. An outline of implementation steps for these two trails is illustrated in the Action Plan.

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Overview of Rail Operations Along Dumbarton right-of-way

It may be feasible for a Bay Trail alignment to be routed along a portion of the SamTrans Dumbarton Rail right-of-way between the Ravenswood Open Space Preserve and University Avenue. Currently this rail corridor is inactive. However, re-activating passenger rail service across a rebuilt Dumbarton trestle is planned by SamTrans and trail planning within this area cannot be furthered until plans are solidified. The recent passage of Regional Measure 2 by Bay Area voters provided a major boost for the future Dumbarton Rail Service, setting aside $135 million in funding for the project. Other funding would come from local tax measures and some state sources.

As currently proposed, the future Dumbarton Rail Service would include 12 commuter trains and carry about 4,800 passengers a day. Initial service would include six trains during the peak a.m. commute period, leaving from Union City with stops in Fremont, Newark, Menlo Park and Redwood City. From Redwood City, three of the trains would continue south to San Jose along existing Caltrain tracks; the other three would head to San Francisco. The trains would make return trips along the same routes during peak evening commute hours. Planners for the Dumbarton Rail Service anticipate having the service operational by 2010.

According to SamTrans, the design speed for the re-activated Dumbarton rail line through this segment would be 79 mile per hour. Actual operating speeds of the commuter trains through this segment is not known at this time, but SamTrans has indicated that the authorized operating speed could be 79 mph as well. The proposed Menlo Park station would be located between Willow Road and Chilco Street.

Development of a trail next to an active rail line (known as a "rail-with-trail" or RWT) requires consideration of a variety of unique safety, security, and operational issues, described in this chapter.

Minimum Required Setback from rail line

The term 'setback' refers to the distance between the edge of a RWT and the centerline of the closest active railroad track while 'separation' refers to the treatment of the space between a RWT and the closest active railroad tracks, including fences, vegetation, ditches, and other items. When determining the minimum setback for a RWT, factors to consider include train speed and frequency, maintenance needs, State standards, separation techniques, historical problems, track curvature, topography, and engineering judgment.

It should be noted that there are no national standards for the design trail facilities next to active rail lines available at this time. As such, none of the designs in this section should be construed as standards or guidelines. They represent best practices as derived from existing rail-with-trails and research on their performance.

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Railroad Operation Issues

Minimum setback from the rail line is perhaps the most important feature of the trail design. Setback is measured from the nearest edge of the trail to the centerline of the nearest railroad track. No empirical data has been discovered indicating the precise setback that is recommended between a public trail and an active railroad, and a review of 61 existing rail-with-trails shows wide variance in the setback distance. Researchers attempted to determine if narrower setback distances have a direct correlation to safety problems; however, based on the almost non-existent record of claims, crashes, and other problems on these RWTs, they were unable to conclude a strong correlation between setback and safety.

An FRA study on the impact of high train speed on people standing on boarding platforms concludes that induced airflow is a safety issue for a person within 2 m (6.5 ft) of a train traveling at 240 km/h (150 mi/h.) There is no consensus on either appropriate setback requirements or a method of determining the requirement. Some trail planners use the AASHTO Bike Guide for guidance. Given that bicycle lanes are set back 1.5 to 2.1 m (5 to 7 ft) from the centerline of the outside travel lane of even the busiest roadway, some consider this analogous. Others use their State Public Utilities Commission's minimum setback standards (also known as 'clearance standards') for adjacent walkways (for railroad switchmen.) These published setbacks represent the legal minimum setbacks based on the physical size of the railroad cars, and are commonly employed along all railroads and at public grade crossings. The minimum setback distance is typically 2.6 m (8.5 ft) on tangent and 2.9 m (9.5 ft) on curved track. However, FRA and railroad officials do not consider either of these methods to be appropriate for a RWT. This is because AASHTO's guidelines for motor vehicle facility design are not seen as comparable to rail design, and the setback distance for the general public should be much greater than that allowed for railroad workers.

At an absolute minimum, the setback must keep trail users outside the "dynamic envelope" of the track, defined as "the clearance required for the train and its cargo overhang due to any combination of loading, lateral motion, or suspension failure." Additionally, in corridors with regular use of maintenance equipment that operates outside the dynamic envelope, the setback distance should allow adequate clearance between the maintenance equipment and the trail.

The Federal Railroad Administration (FRA) already publishes minimum setback standards for fixed objects next to active railroad tracks, the distance between two active tracks, and adjacent walkways (for railroad switchmen). These published setbacks represent the legal minimum setbacks based on the physical size of the railroad cars, and are commonly employed along all railroads and at all public grade crossings.

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The California Public Utilities Commission (CPUC), which regulates railroad activities within California, also has specific minimum setbacks for any structures or improvements adjacent to railroads, including any sidewalk or trail that parallels active railroad tracks. According to the CPUC standards, minimum distances from the centerline of an active railroad to the outside edge of a trail or bikeway is 8.5 feet on tangent and 9.5 feet on curved track (General Order No. 26-D). Wherever possible, the CPUC recommends that the trail be set back at least 25 feet from the centerline of the tracks, or at least 15 feet when there is a vertical separation of more than 10 feet.

SamTrans, who in 1994 purchased the Dumbarton Rail Corridor right-of-way for future rail service, has stated that it will not consider any trail improvements less than 15 feet from the centerline of the track alignment. It should be noted that future rail service on the Dumbarton corridor would involve a double-track configuration; therefore the actual setback would depend on the final location of the double track within the existing right of way. SamTrans has indicated that a double track configuration would require a minimum separation of 15 feet between the track centerlines. Assuming that the double track would be constructed equidistant from the current single track, the centerline of the southern track would be an additional 7.5 feet from the location of the current track.

Recommendation

Given the potential high-speeds of the proposed commuter rail service that will run along the Dumbarton Corridor, it is recommended that the proposed Bay Trail have a minimum 25-foot setback (from the track centerline), and that 50 foot setback is recommended where feasible to achieve the additional width.

For the Preferred Alignment trail segment along the rail line, achieving the recommended 50 foot setback appears to be possible by using the paved and unpaved service roads along the southern side of the tracks east of University Avenue. Through this area, there is approximately 60 feet between the railroad tracks and the service road. This alignment would locate the trail outside of the SamTrans right-of-way, and in SFPUC property. Both the paved and unpaved service roads would need to be upgraded to meet Class I multi-use trail standards, and to allow for joint use by service/maintenance vehicles and trail users.

For the Preferred Alignment trail segment, east of where the unpaved service road curves away from the tracks and the rail line begins to be built up along a levee, achieving neither the minimum 25 foot setback or recommended 50 foot setback nor would be possible on the existing narrow railroad levee. In this area, a boardwalk trail design is recommended to locate the trail with an appropriate setback from the railroad centerline. The vertical separation in along this segment (the rail line will be located up on the levee at a higher elevation than the boardwalk trail) would achieve many of the benefits of the horizontal separation.

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Railroad Operation Issues

In addition to the setback, fencing or a vegetation barrier is recommended to be planted between the trail and the railroad tracks to provide a physical and visual barrier. Fencing and other barriers are discussed in greater detail later in this section.

Railroad Track Crossings

The point at which trails cross active tracks is the area of greatest concern to railroads, trail planners, and trail users. Railroad owners, the FRA, and states have spent years working to reduce the number of at-grade crossings in order to improve public safety and increase the efficiency of service. RWT design should minimize new at-grade crossings wherever possible.

The proposed Bay Trail Preferred Alignment would not involve any crossings of the Dumbarton Rail line as they connect out toward University Avenue. However, the proposed plans do show a "future trail spur and/or spine" that crosses the rail line and connects to the Dumbarton Bridge Class I trail. The trail crossing of the rail line is shown at the existing at-grade SFPUC service road crossing. This location is currently not controlled with gates or other warning devices, as it is located on SFPUC property and intended for use only by service vehicles.

SamTrans and the California Public Utility Commission would need to approve the new rail trail crossing, the design of which must be in compliance with the MUTCD. Relevant information also is contained in the Railroad-Highway Grade Crossing Handbook (FHWA, 1986) and U.S. DOT Highway-Rail Grade Crossing Technical Working Group (TWG) document, Guidance on Traffic Control Devices at Highway-Rail Grade Crossings (FHWA, 2002).

Advanced Warning Devices at Trail-Rail Crossings

A variety of warning devices are available for trail-rail crossings. In addition to the MUTCD standard devices, there are innovative treatments developed to encourage cautious bicyclist and pedestrian behavior. This report does not sanction one type of treatment as being appropriate for all trail-rail crossings, nor does the MUTCD provide a standard design for highway-track crossings. The MUTCD states, "Because of the large number of significant variables to be considered, no single standard system of traffic control devices is universally applicable for all highway-rail grade crossings. The appropriate traffic control system should be determined by an engineering study involving both the highway agency and the railroad company." The same applies for trail-rail intersections.

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There are two categories of advanced warning devices:

- Passive warning devices: signs and pavement markings that alert trail users that they are approaching a trail-rail crossing and direct them to proceed with caution and look for trains.
- Active warning devices: advise trail users of the approach or presence of a train at railroad crossings. These consist of bells, flashing lights, automatic gates, and other devices that are triggered by the presence of an approaching train.

Passive Warning Devices at Trail-Rail Crossings

Trail-rail crossings with passive warning devices should comply with the MUTCD's minimum recommended treatment at highway- rail grade crossings. The MUTCD states, "One Crossbuck sign shall be installed on each highway approach to every highway-rail grade crossing, alone or in combination with other traffic control devices."

The MUTCD also states that "if automatic gates are not present and if there are two or more tracks at the highway-rail grade crossing, the number of tracks shall be indicated on a supplemental Number of Tracks (R15-2) sign...mounted below the Crossbuck sign... (R15-1.)." Refer to the MUTCD for further guidance regarding the location and retro-reflectivity of these signs.

Stop and Yield Signs

The MUTCD makes the following statements about the use of STOP and YIELD signs at highway-rail grade crossings: "At the discretion of the responsible State or local highway agency, STOP or YIELD signs may be used at highway-rail grade crossings that have two or more trains per day and are without automatic traffic control devices." This may also apply to trail crossings, as determined by an engineering study that considers the number and speed of trains, sight distances, the collision history of the area, and other factors. Willingness of local law enforcement personnel to enforce the STOP signs should also be considered.

Warning Signs

The MUTCD also contains a number of warning signs that can be used to indicate the configuration of the upcoming crossing, or to otherwise warn users of special conditions. Warning signs that may be appropriate for RWTs include MUTCD signs: W10-1, W10-2, W10-3, W-10-4,W10-8,W10-8a, R15-1,R-15-2, R15-8, and W10-11.

Other Signs

The MUTCD applies to all signs that may be considered traffic control devices, whether on roads or on shared use paths. The MUTCD provides specifications on sign shapes,

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colors, dimensions, legends, borders, and illumination or retro-reflectivity. Section 2A.06 notes that "State and local highway agencies may develop special word message signs in situations where roadway conditions make it necessary to provide road users with additional regulatory, warning, or guidance information."

The MUTCD does not apply to signs that are not traffic control devices, such as "No Trespassing" signs and informational kiosks. Many jurisdictions require "No Trespassing" signs to be posted along railroad tracks. Some railroad companies, trail developers, and State and local governments have used a number of non-MUTCD-compliant supplemental signs at rail-trail crossings. Some of these have been adopted in State or local roadway and/or trail design guidelines. While these signs may provide information not available on MUTCD-compliant signs, they may increase the trail developer's or community's liability exposure.

The MUTCD recognizes that continuing advances in technology will produce changes that will require updating the Manual, and that unique situations often arise for signs and other traffic control devices which may require changes. Section 1A.10 describes the procedure to request changes or permission to experiment with traffic control signs and devices.

Pavement Markings

In the case of paved trails, pavement markings also are required by the MUTCD. At a minimum, they should consist of an "X", the letters "RR", and a stop bar line. (See Parts 8 and 9 of the MUTCD.) For unpaved trails, consideration should be given to paving the approaches to trail-rail crossings, not only so that appropriate pavement markings can be installed, but also to provide a smooth crossing. If it is not possible to pave the approaches, additional warning devices may be needed.

Active Warning Devices at Trail-Rail Crossings

An engineering study is recommended for all trail-rail crossings to determine the best combination of active safety devices. Key considerations include train frequency and speed, sight distance, other train operating characteristics, presence of potential obstructions, and volume of trail users.

Active traffic control systems advise trail users of the approach or presence of a train at railroad crossings. Information regarding the appropriate uses, location, and clearance dimensions for active traffic control devices can be found in Part 8 of the MUTCD. In Active warning devices at Burlington Waterfront Bikeway track crossing. Burlington, VT addition, Part 10 of the MUTCD contains specific recommendations for pedestrian and bicycle signals at light rail transit tracks, and should be referred to in cases where trails cross light rail transit corridors.

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See Guidance on Traffic Control Devices at Highway-Rail Grade Crossings for information about selection of traffic control devices. Flashing light signals combined with swing gates may be needed in cases of high speed transit or freight rail, limited sight distance, multiple tracks, and temporary sight obstructions, such as standing freight cars.

Railroad and trail planners should note that the same controls that generally keep a motor vehicle from crossing a track may not keep a pedestrian or bicyclist from proceeding through a crossing. People on foot or bicycle are reluctant to stop at barriers and will often find a way to proceed over, under, or around barricades.

Fencing and Barriers

For segments of the proposed Bay Trail that will run adjacent to the railroad corridor, installation of a fencing or barrier between the trail and rail line is recommended to prevent trespassing. In addition, trains will generate noise, dust, and vibration, which may be seen as a nuisance to adjacent trail users. Of the 61 known RWT facilities operating in the United States today, 71 percent have some type of physical barrier between the trail and tracks. The types of barriers in use include fences, walls, vegetation, grade differences and ditches.

Fences

Fences are the most common type of physical barrier used along trail corridors to prevent trespassing. A number of fencing types are available, ranging from simple low wood rail fences to tall, heavy-duty steel fences. Selection of a fencing type depends on the amount of trespassing anticipated along a given segment of the RWT, and the aesthetic qualities desired. Typically there is a trade-off between security and aesthetics: the more trespass-resistant a given fencing type the more visually unattractive it tends to be. Fencing style and material is a matter of local preference and railroad requirements. For the proposed Bay Trail, a chain-link fence is expected to be the most appropriate fencing style. This inexpensive and ubiquitous fencing material is perhaps the most common fencing type, and is considered adequate for most situations to keep people on the trail and discourage trespassing. Most chain link fences are visually unappealing; however, vinyl-coated chain link fencing (in black or green) is often considered a more aesthetically pleasing alternative. A chain link fence with a plastic woven fabric or wood battens in the chain link material provides an additional solid-type barrier to help catch debris and provide wind and visual buffering.

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Railroad Operation Issues

Vegetation
Whether natural or planted, vegetation can serve as both a visual and physical barrier between a track and a trail. The density and species of plants in a vegetative barrier determine how effective the barrier can be in deterring potential trespassers. A dense thicket can be, in some cases, just as effective as a fence (if not more so) in keeping trail users from trespassing onto adjacent property. Planted barriers typically take a few years before they become effective barriers. Separation between the trail and the track may need to be augmented with other temporary barriers until planted trees and hedges have sufficiently matured.

Recommendation
Due to safety and security issues, fencing should be installed in all locations where the proposed Bay Trail alignment runs adjacent to the Dumbarton rail line or SFPUC property. All fencing should be located a minimum of 15 feet from the nearest track to allow for maintenance vehicles. With normal setback, fencing height should range between 36 inches and 48 inches, with 42 inches standard. Baffling material includes vegetation such as ivy or other vines, or a solid material such as wood. Regardless of fence type, railroad maintenance vehicles and/or emergency vehicles may need fence gates in certain areas to facilitate access to the track and/or trail. Fence design should be coordinated with SamTrans railroad maintenance personnel, as well as representatives from SFPUC.

Maintenance
While most maintenance items for a trail located adjacent to a railroad facility are largely identical to any multi-use trail of the same surface, sub-grade and sub-base, if the railroad or utility owns the property and must use the trail section as an operations and maintenance access road, a number of other issues must be addressed:

Trail design: The trail surface should be wide enough to allow for a light vehicle to pass trail users slowly, including disabled persons, without either having to leave the paved surface. Typically, a 10-foot wide pathway with a hard-packed shoulder would be a minimal width, although 12 feet is preferred. The trail agreement should state that the trail should be constructed to standards sufficient to support the expected range of equipment and activities to occur on the railroad or adjacent utility, that the railroad/utility will take reasonable care not to impact the trail or other improvements, including fencing and landscaping. Most trail agreements assign responsibility for any trail repairs or other related improvements to the trail managing entity.

Frequency of Access: This is a key issue, as it will determine the frequency of risk to trail users and/or the need to implement temporary trail closures. This must be addressed in any license or easement agreement. The greater the need to use the trail as a maintenance road, the more important the design and operation.

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Routine Maintenance: Most routine maintenance, such as track and corridor inspections and security patrols, can be accomplished with lighter vehicles traveling at lower speeds (25 mph or less). These activities are typically compatible with shared-use trails, but should be scheduled if at all possible for times when expected trail use is low (i.e., weekdays). Railroad/utility personnel should be trained how to drive on the trail, and especially how to be cautious in areas of limited visibility. Trail users should be advised that the trail is used by maintenance vehicles, and to expect vehicles on the paved surface. The general parameters of time of day and week, type of vehicle, activities, speed limits, and liability should be covered in a use, license, or easement agreement.

Long-Term Maintenance: A license agreement should address advance notice when railroad/utility maintenance activities are expected to require closure of the trail between public access points. The trail should be closed if any heavy equipment is expected to use the trail, or when any maintenance activities are occurring that could be injurious to the general public. The agreement should identify who would take the appropriate measures to close the segment of trail and be responsible for keeping the public off of the trail, arranging detours, and notifying the public.

Emergency Access: Emergency access for safety, security, or maintenance purposes should be covered in a license agreement. The contact and response protocol and responsibility should be covered in detail. Appropriate contact information for emergencies, including railroad and utility contracts, should be posted on the trail, and be available to all local police, fire, and other relevant agencies.

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Cost Evaluation

Cost estimates for design and construction have been developed on an order-of-magnitude basis. These cost estimates reflect the proposed trail alignment design as envisioned in this feasibility study. Because the estimates have been developed without the benefit of specific design drawings, they are considered to be preliminary and subject to change.

It should be noted that the cost estimates reflect an separate estimate for each proposed alignment. Neither environmental mitigation costs nor property acquisition costs are included in this estimate. A wetlands delineation map and habitat map should also be created and reviewed by the regulatory agencies to help avoid any impacts to sensitive species in the project area. In reality, each reach would need to undergo further study, including CEQA analysis, and more detailed design development before the trail could be implemented.

For all proposed trail alignments, the cost of a new sidewalk along the east side of University Avenue has been added to the Preferred Alignment. This new sidewalk from Purdue Avenue north to the Bayfront Expressway (Highway 84) would provide the pedestrian access adjacent to an existing Class II bike lane, within the University Avenue street right of way.

The cost estimate relates to the Preferred Plan illustrated previously and are summarized as follows:

- Preferred Alignment (Bay Trail Option 2): $2,553,500
- Future Trail Spur and/or Spine: Not included.

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City of Menlo Park

Estimate of Probable Construction Costs
Bay Trail Feasibility Study
Conceptual Plan

Preferred Alignment (Bay Trail Option 2) (including raised boardwalk along SPRR and University Avenue sidewalk)

prepared on: 6/18/04
prepared by: WS/BF/PC

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
A	**Project Start-up**					
1.	Mobilization	Allow	1%	$13,809.00	$13,809.00	
2.	Bonding	Allow	2.5%	$34,522.50	$34,522.50	
3.	Traffic control	Allow	0.5%	$6,904.50	$6,904.50	
4.	Staking	Allow	0.5%	$6,904.50	$6,904.50	
5.	Stormwater pollution prevention measures	Allow	LS	$10,000.00	$10,000.00	
						$72,140.00
B	**Demolition**					
1.	Clearing and grubbing	49,400	SF	$0.20	$9,880.00	
2.	Miscellaneous removals	Allow	LS	$5,000.00	$5,000.00	
						$14,880.00
C	**Grading and Drainage**					
1.	Trail grading, 1' depth	1,800	CY	$20.00	$36,000.00	
2.	Miscellaneous drainage	Allow	LS	$8,000.00	$8,000.00	
						$44,000.00
D	**Site Construction**					
1.	AC path, 8' wide	2,700	LF	$24.00	$64,800.00	
2.	Decomposed granite shoulder, 2' wide	5,400	LF	$5.00	$27,000.00	
3.	Striping	2,700	LF	$0.50	$1,350.00	
4.	Chain link fencing (along railroad), 8' height	2,700	LF	$35.00	$94,500.00	
5.	Railroad crossing - warning gates, signals and striping	(not in contract)				
						$187,650.00
E	**University Avenue Sidewalk, Curb and Gutter**					
1.	Clearing and grubbing	30,500	SF	$0.20	$6,100.00	
2.	Miscellaneous removals	Allow	LS	$2,000.00	$2,000.00	
3.	Rough grading, 6" depth	282	CY	$20.00	$5,640.00	
4.	Concrete sidewalk	15,250	SF	$8.00	$122,000.00	
5.	Curb and gutter	3,050	LF	$30.00	$91,500.00	
6.	Curb ramp	1	EA	$500.00	$500.00	
7.	Railroad crossing - warning gates	(not in contract)				
8.	Hydroseeding - native grasses	15,250	SF	$0.10	$1,525.00	
						$229,270.00
F	**Bridge and/or Boardwalk**					
1.	Prefabricated bridge (estimated length)	150	LF	$1,800.00	$270,000.00	
2.	Abutments	2	EA	$20,000.00	$40,000.00	
3.	Rip rap at abutments	600	SF	$20.00	$12,000.00	
4.	Boardwalk, 8' wide	1,250	LF	$300.00	$375,000.00	
5.	Pedestrian railing at boardwalk	1,250	LF	$100.00	$125,000.00	
6.	Metal fencing at boardwalk, 6' height	1,250	LF	$30.00	$37,500.00	
						$859,500.00
G	**Site Furnishings**					
1.	Rules and regulations signage	2	EA	$250.00	$500.00	
2.	Directional signage	4	EA	$250.00	$1,000.00	
3.	Miscellaneous signage	Allow	LS	$1,000.00	$1,000.00	
4.	Trail map	1	EA	$8,000.00	$8,000.00	
5.	Interpretive signage	2	EA	$6,000.00	$12,000.00	
6.	Bollard	6	EA	$400.00	$2,400.00	
						$24,900.00
H	**Planting**					
1.	Hydroseeding - native grasses	27,000	SF	$0.10	$2,700.00	
2.	Revegetation	Allow	LS	$15,000.00	$15,000.00	
3.	Plant establishment	6	MO	$500.00	$3,000.00	
						$20,700.00
I	**Mitigation**	(to be determined)				

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prepared for the
City of Menlo Park

Estimate of Probable Construction Costs
Bay Trail Feasibility Study
Conceptual Plan

Preferred Alignment (Bay Trail Option 2) (including raised boardwalk along SPRR and University Avenue sidewalk)

prepared on: 6/18/04
prepared by: WS/BF/PC

Item #	Description	Qty	Unit	Cost	Item Total	Subtotal
J	**Total of Construction**					$1,453,040.00
K	**Contingencies**					
1.	Construction changes	Allow	4%	$58,121.60	$58,121.60	
2.	Inflation (3% over next ten years)	Allow	30%	$435,912.00	$435,912.00	
3.	Level of estimate accuracy	Allow	15%	$217,956.00	$217,956.00	
4.	Regulatory agency measures	Allow	1%	$14,530.40	$14,530.40	
						$726,520.00
L	**Professional Services**					
1.	Topographic survey	Allow	LS	$20,000.00	$20,000.00	
2.	Geotechnical engineer	Allow	LS	$16,000.00	$16,000.00	
3.	Biological consultant	Allow	LS	$3,000.00	$3,000.00	
4.	Habitat map (species map, mitigation map)	Allow	LS	$4,000.00	$4,000.00	
5.	Wetlands delineation map	Allow	LS	$4,000.00	$4,000.00	
6.	Design development	Allow	3%	$65,386.80	$65,386.80	
7.	Construction documents	Allow	8%	$174,364.80	$174,364.80	
8.	Bidding and construction administration	Allow	3%	$65,386.80	$65,386.80	
9.	Testing and special inspection	Allow	1%	$21,795.60	$21,795.60	
						$373,930.00
M	**Permitting**	(to be determined)				
N	**Property Acquisition/Trail Easements**	(to be determined)				
O	**Total Estimated Project Costs**					**$2,553,490.00**
P	**Cost of Trail per Linear Foot**	4,100	LF	$622.80	$622.80	
						$622.80

Based on drawing entitled "Bay Trail Feasibility Study Opportunities Plan" dated 6/18/04

The above items, amounts, quantities, and related information are based on Callander Associates' judgment at this level of document preparation and is offered only as reference data. Callander Associates has no control over construction quantities, costs and related factors affecting costs, and advises the client that significant variation may occur between this estimate of probable construction costs and actual construction prices.

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Action Plan

This chapter summaries the future steps needed to complete this reach of the Bay Trail. The Preferred Alignment and Future Trail spur and/or trail are included in the following matrix, outlining needed actions for implementation. The matrix addresses such issues as property acquisition or easements, liability agreements, environmental documentation, further planning and design, and construction documents needed.

It should be noted that this Action Plan matrix is only a conceptual road map that identifies the major tasks. As the planning process continues, issues or actions may be added, deleted or reprioritized as necessary to accommodate the changing regulatory, stakeholder, planning and environmental issues.

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Issues	Preferred Alignment (Bay Trail Option 2)	Future Trail Spur and/or Spine
Property issues (related to "Stakeholders, issues and planning effort needed to occur" below)	• be considerate of environmental cleanup efforts and ongoing salt pond to salt marsh restoration efforts • collaborate with stakeholders and related City/County government departments on short-term and long term site planning for privately/publicly owned sites • outreach and network with stakeholders as to the potential, timing, type of acquisition/trail easement agreements possible • evaluate timing, probability, and feasibility of property acquisitions and/or trail easement negotiations for proposed trail alignments • identify preferred alignment	
Stakeholders, site specific issues and planning effort needed to occur (related to "Property issues" above)	*MPROSD* • negotiate trail easement *SamTrans* (Dumbarton Rail Corridor) • reactivation of rail corridor • negotiate easement associated with railroad reactivation *SFPUC* (service road and parcel south of Dumbarton Rail Corridor) • negotiate trail easement with regard to reactiviation of rail corridor and service truck access *Caltrans* (University Avenue R.O.W.) • encroachment permit for sidewalk	*SamTrans* (Dumbarton Rail Corridor) • reactivation of rail corridor • negotiate easement associated with railroad reactivation • approve rail crossing methods *SFPUC* (service road and parcel south of Dumbarton Rail Corridor) • negotiate trail easement with regard to reactiviation of rail corridor and service truck access *Cargill Salt* (Cargill salt ponds) • wetlands restoration complete • negotiate trail easement in conjunction with USFWS *U.S. Fish and Wildlife Service* (to be transferred after Cargill restoration) • wetlands restoration complete • negotiate trail easement in conjunction with Cargill Salt Ponds *MPROSD* (parcel east of Cargill salt ponds at edge of the San Francisco Bay) • negotiate trail easement
Habitat map	✓ noted salt marsh harvest mouse habitat potential	✓ noted salt marsh harvest mouse habitat potential
Wetlands delineation map	✓	✓
Topographic map	✓	✓
Preliminary planning – Regulatory agency	• submit habitat map, biological survey, and wetlands delineation map to U.S. Fish and Game, State Fish and Wildlife, and U.S. Army Corps for further preliminary review of proposed trail alignment • receive input on preferred trail alignment and any opportunities/constraints new mapping information may present	
Environmental cleanup	unknown	• three phase cleanup (called "Baylands Recovery Project) and restoration of the Sportsman's Club (on SFPUC property); anticipated for completion in 2005
Salt pond/wetlands restoration	unknown	• Pond SF2, the Cargill Salt parcel undergoing cleanup and environmental restoration for wetlands area; could take five years • once cleanup completed, property transferred to USFWS as part of Don Edwards SF Bay National Wildlife Refuge

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Issues	Preferred Alignment (Bay Trail Option 2)	Future Trail Spur and/or Spine
Caltrans coordination	• collaborate with Caltrans for encroachment of proposed sidewalk within the right-of-way on the east side of University Avenue from Purdue Avenue to Highway 84 • apply for encroachment permit for new sidewalk	
Funding for advanced trail planning, design, and construction	• apply for and secure funding for advanced planning process • network through ABAG and other local regional agencies, governments, and non-profits • seek and write grants • potential to raise funds through environmental, educational, bicycle/pedestrian advocacy groups	
Refine preferred trail alignment	• based upon environmental agency, stakeholder, completion of environmental cleanup, salt marsh restoration, and other planning efforts help identify a trail alignment that is most feasible • identify a final preferred trail alignment • develop more detailed drawings • hold public outreach process for input • revise alignment and trail amenities to reflect input • develop construction drawings and specifications for the trail reach • develop maintenance plan and identify agencies responsible for patrolling/enforcement	
CEQA review	• take the project through the CEQA process • identify any mitigation resources as needed • collaborate with Cargill, U.S. Fish and Wildlife Service, and local stakeholders for potential opportunities for mitigation improvements on their site • identify mitigation actions as near to the trail site as possible	
Property acquisition and trail easement negotiation	• acquire properties needed and/or trail easement negotiations as identified in action item "Property issues" above	
Advanced design development	• revise drawings and specifications to address CEQA recommendations • submit finalized drawings for environmental CEQA	

Permits	• submit approved CEQA construction drawings and specifications for necessary City, County, Caltrans, and other permits as needed
	• receive needed permits prior to construction
	• partial list of potential permit/regulatory agencies:
	  • City of Menlo Park
	  • City of East Palo Alto
	  • Bay Conservation and Development Ccommission
	  • California Dept. of Fish and Game
	  • California RWQCB
	  • U.S. Army Corps of Engineers
	  • U.S. Fish and Wildlife Services
	  • Caltrans	

Trail construction	• be considerate of natural, sensitive habitat, transit operations, and neighbors that are near trail construction areas • provide high quality of workmanship in a timely manner to help reduce construction impacts • complete the trail on time and on budget, closing one gap in the San Francisco Bay Trail loop	

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Funding Sources

There are a variety of potential funding sources including local, state, regional, and federal funding programs that can be used to construct the proposed Bay Trail project. Most of the Federal, state, and regional programs are competitive and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. Local funding for bicycle projects typically come from Transportation Development Act (TDA) funding, which is prorated to each County based on the return of gasoline taxes. Many of the projects and programs would need to be funded either with TDA, general fund (staff time), and regional, State and Federal sources. The primary funding sources are described below.

Federal Funding Sources

Transportation Equity Act for the 21st Century (TEA-21)
TEA-21 funding is administered through the state (Caltrans or Resources Agency) and regional governments (MTC, San Mateo County Transportation Authority). Most, but not all, of the funding programs are transportation versus recreational oriented, with an emphasis on reducing auto trips and providing inter-modal connections. Funding criteria often includes completion and adoption of a bicycle/pedestrian master plan, quantification of the costs and benefits of the system (such as saved vehicle trips and reduced air pollution), proof of public involvement and support, CEQA compliance, and commitment of some local resources. In most cases, TEA-21 provides matching grants of 80 to 90 percent, but prefers to leverage other monies at a lower rate. This Federal Transportation Legislation Program is expected to be reauthorized in 2004. The updated TEA legislation is expected to continue support for many of the non-motorized programs that were contained in TEA-21, with current discussions pointing to the inclusion of new non-motorized programs.

Congestion Mitigation and Air Quality Improvement Program
Congestion Mitigation and Air Quality Improvement funds are programmed by TEA-21 for projects that are likely to contribute to the attainment of a national ambient air quality standard, and congestion mitigation. These funds can be used for a broad variety of bicycle and pedestrian projects, particularly those that are developed primarily for transportation purposes. The funds can be used either for construction of bicycle transportation facilities and pedestrian walkways or for non-construction projects related to safe bicycle and pedestrian use (maps, brochures, etc.). The projects must be tied to a plan adopted by the State and MPO.

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National Highway System
National Highway System funds are for improvements to the National Highway System (NHS), which consists of an interconnected system of principal arterial routes that serve major population centers, international border crossings, airports, public transportation facilities, and other intermodal transportation facilities as well as other major travel destinations. These funds can be used to provide pedestrian and bicycle facilities constructed on NHS routes.

Federal Lands Highway Funds
Federal Lands Highway funds may be used to build bicycle and pedestrian facilities in conjunction with roads and parkways at the discretion of the department charged with administration of the funds. The projects must be transportation-related and tied to a plan adopted by the State and MPO.

State Funding Sources

National Recreational Trails Fund
The Recreational Trails Program provides funds to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other non-motorized as well as motorized uses.

Recreational Trails Program funds may be used for:

- Maintenance and restoration of existing trails;
- Development and rehabilitation of trailside and trailhead facilities and trail linkages;
- Purchase and lease of trail construction and maintenance equipment;
- Construction of new trails (with restrictions for new trails on federal lands);
- Acquisition of easements or property for trails;
- State administrative costs related to this program (limited to seven percent of a State's funds); and
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

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Funding Sources

Bicycle Transportation Account

The State Bicycle Transportation Account (BTA) is an annual statewide discretionary program that is available through the Caltrans Bicycle Facilities Unit for funding bicycle projects. Available as grants to local jurisdictions, the emphasis is on projects that benefit bicycling for commuting purposes. Due to the passage of AB1772 in the year 2000, the BTA has $7.2 million available each year for the next five years. Following the year 2005, the fund will drop to $5 million per year unless new legislation is authored. The local match must be a minimum of 10% of the total project cost.

Environmental Enhancement and Mitigation Program

Environmental Enhancement and Mitigation Program Funds are allocated to projects that offset environmental impacts of modified or new public transportation facilities including streets, mass transit guideways, park-n-ride facilities, transit stations, tree planting to equalize the effects of vehicular emissions, and the acquisition or development of roadside recreational facilities, such as trails. State gasoline tax monies fund the EEMP. This program represents an outstanding opportunity to fund future phases of the Solano Bikeway Extension Project as mitigation to the ongoing work on I-80.

Safe Routes to School (AB 1475)

The Safe Routes to School program is a recently created state program using funds from the Hazard Elimination Safety program from TEA-21. This program is meant to improve school commute routes by eliminating barriers to bicycle and pedestrian travel through rehabilitation, new projects, and traffic calming. Although the program finished its last cycle in 2002, it is anticipated that it will be re-instated with the passage of TEA-3.

Regional Funding Sources

Coastal Conservancy

The Coastal Conservancy provides funding for public access projects along the coast and around San Francisco Bay. Eligible project activities include property acquisition, site planning, trail and support facility construction, and signage. Eligible grantees are local governments and special districts, such as regional park and port districts.

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Transportation Funds for Clean Air Program (TFCA)

BAY AREA AIR QUALITY TRANSPORTATION FUND FOR CLEAN AIR

Clean Air Funds are generated by a surcharge on automobile registration in the nine counties that make up Bay Area Air Quality Management District (BAAQMD). Approximately $20 million is collected annually which funds two programs: the Transportation Fund for Clean Air 60%, a regional competitive fund appropriated by the BAAQMD, and the Program Manager Fund, also known as the 40% Fund, which is returned to each county to be appropriated by its' CMA or Transportation Authority.

SPARE AIR

The 40% funds are considered local funds; they are competitive and 100% discretionary. Projects must be consistent with BAAQMD's Clean Air Plan and recipient projects are required to document air quality benefits. These local funds can be used as a match for state or federal programs. Applicants for new projects must demonstrate that they applied for regional competitive TFCA funds and were denied, or that the project would not have been competitive for regional TFCA funds. Projects will be scored according to six criteria (cost effectiveness, project effectiveness, local matching funds, new programs, projects of county-wide significance, and mode shift), and reviewed by a scoring panel. The panel may recommend that some projects compete in the 60% category.

Transportation for Livable Communities (TLC)

MTC offers two kinds of assistance through the TLC program: capital improvement and planning. TLC grants are competitive funds meant to fund small-scale transportation improvements that are designed to make a big difference in a community's vitality. Eligible projects include streetscape improvements, transit, pedestrian, and bicycle oriented developments. Projects should be designed to "bring new vibrancy" to downtown areas, commercial cores and neighborhoods, enhancing their amenities and ambience and making them places where people want to live and visit.

Local Funding Sources

TDA Article III (SB 821)

Transportation Development Act (TDA) Article III funds are state block grants awarded annually to local jurisdictions for bicycle projects in California. These funds originate from the state gasoline tax and are distributed to local jurisdictions based on population. These funds should be used as leveraging monies for competitive state and federal sources.

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Table 6-3 Funding Sources

Acronyms:
AQMD - Air Quality Management District
Caltrans - California Department of Transportation
CMAQ - Congestion Management and Air Quality
CTC - California Transportation Commission
FHWA - Federal Highway Administration
STANCOG – Stanislaus Council of Governments
RTPA - Regional Transportation Planning Agency
State DPR - California Department of Parks and Recreation (under the State Resources Agency)
TEA-21 - Transportation Equity Act of the 21st Century

Jurisdictions for Menlo Park, California:
Caltrans - Caltrans District 4
C/CAG – City/County Association of Governments, San Mateo County
San Mateo County Transportation Authority
Resources:
Caltrans TEA-21 website - http://www.dot.ca.gov/hq/TransEnhAct/

Grant Source	Due Date	Agency	Annual Total	Matching Requirement	Eligible Applicants	Eligible Bikeway Projects			Comments
						Commute	Recreation	Safety/Ed	
Federal Funding									
TEA-21 Regional Surface Transportation Program (RSTP)	varies by RPTA	RTPAs, Caltrans	$320 m	11.47% non-federal match	cities, counties, transit operators, Caltrans, and MPOs	X	X		RSTP funds may be exchanged for local funds for non-federally certified local agencies; no match may be required if project improves safety. Contact Cathy Gomes, Caltrans, (916) 654-3271
TEA-21 Congestion Mitigation and Air Quality Program (CMAQ)	Dec. 1 yearly	RTPAs, Caltrans	$400 m	11.47% non-federal match	federally certified jurisdictions	X			Counties redesignated to attainment status for ozone may lose this source. Contact Cathy Gomes, Caltrans, (916) 654-3271
TEA-21 Transportation Enhancement Activities (TEA)	varies by RTPA	RPTAs, Caltrans	$60 m	11.47% non-federal match	federally certified jurisdictions	X	X		Funds are dispersed through the four shares listed below.
Regional Share	varies by RTPA	RTPAs, Caltrans	$45 m	"	federal, state, or local, depending on category	X	X		Funding share to RTPAs.
Caltrans Share	varies by RTPA	Caltrans	$6.6 m	"	Caltrans	X	X		Funding share to Caltrans. Available only if regional TEA funds are not used
Statewide Transportation Enhancement Share	varies by RTPA	Caltrans, State Resources Agency	$20-30 m	"	federal, state (except Caltrans), regional and local agencies with a state partner	X	X		Funding share for all 12 TEA categories except conservation lands.
Conservation Lands Share	varies by RTPA	Caltrans, State Resources Agency	$11 m	"	RTPAs, counties, cities and non-profits.	X	X		Funding share for conservations lands category - acquisitions of scenic lands with high habitat conservation value.
TEA-21 Recreational Trails Program (RTP)	Oct. 1	State DPR	$3 m	20% match	jurisdictions, special districts, non profits with management responsibilities over the land		X		For recreational trails to benefit bicyclists, pedestrians, and other users; contact State Dept. of Parks & Rec., Statewide Trails Coordinator, (916) 653-8803
Transportation and Community and System Preservation Pilot Program	pending	FHWA	$25 m nationwide	--	state, local, MPOs	--	--	--	Projects that improve system efficiency, reduce environmental impacts of transportation, etc. Contact K. Sue Kiser, Regional FHWA office, (916) 498-5009
Land & Water Conservation Fund (LWCF)	May 1st	State DPR	$7.7 m statewide	50%, including in-kind	Federal, state, city, county, eligible districts		X		Federally-funded. Projects that acquire and develop outdoor recreation areas and facilities. Contact Odel King, State DPR, (916) 653-8758
State Funding									
Environmental Enhancement and Mitigation Program (EEMP)	Nov.	State Resources Agency, Caltrans	$10 m statewide	not required but favored	local, state and federal government non-profit agencies	X	X	X	Projects that enhance or mitigate future transportation projects; can include acquisition or development of roadside recreational facilities. Contact Carolyn Dudley, State Resources Agency, (916) 653-5656
Safe Routes to School (SB 10)	May 31	Caltrans	$18 m	11.5% min.	city, county	X	X	X	Primarily construction program to enhance safety of pedestrian and bicycle facilities. Contact. Caltrans District 4, (510) 286-5598
Habitat Conservation Fund Grant Program	October 1	State DPR	--	50% non-state	city, county, eligible districts	-	-	-	Includes a trails/program/urban access category. Contact Odel King, State DPR, (916) 653-8758

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Grant Source	Due Date	Agency	Annual Total	Matching Requirement	Eligible Applicants	Eligible Bikeway Projects			Comments
						Commute	Recreation	Safety/Ed	
Bicycle Transportation Account	December	Caltrans	$7.2 m	min. 10% local match on construction	city, county	X		X	State-funded. Projects that improve safety and convenience of bicycle commuters. Contact Ken McGuire, Caltrans, (916) 653-2750
Regional Transportation Improvement Program (RTIP)	December 15, odd years	RTPA	--	--	city, county, transit operators, Caltrans	X		X	Part of State Transportation Improvement Program (STIP), the main state program for transportation project funding. For "improving transportation within the region." RTPA must program funds.
Petroleum Violation Escrow Account (PVEA)	On-going	State Legislature	$5 m	--	city, county, transit operators, Caltrans	--	--	--	Bicycle and trail facilities have been funded with this program. Contact Caltrans Federal Resource Office, (916) 654-7287
Community Based Transportation Planning Demonstration Grant Program	Nov.	Caltrans	$3 m	20% local	MPO, RPTA, city, county	X			Projects that exemplify livable community concepts. Contact Leigh Levine, Caltrans, (916) 651-6012
Office of Traffic Safety Grants	Jan. 31	Office of Traffic Safety	--	--	state, city, county			X	Bicycle and pedestrian projects have been funded through this program. Contact OTS, (916) 262-0990
Local Funding									
Transportation Development Act (TDA) Article 3 (2% of total TDA)	Jan.	RPTA	--	--	--	--	--	--	C/CAG
State Gas Tax (local share)	--	State Auditor Controller	--	--	--	X		X	Allocated by State Auditor Controller
Developer Fees or Exactions (developer fee for street improvements - DFSI)	--	Cities or County	--	--	--	--	--	--	Mitigation required during land use approval process

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Conclusion

This study and the supplement document should be used as a concept tool for the City of Menlo Park, the City of East Palo Alto, and other agencies to help guide development of the trail reach to close this specific gap in the San Francisco Bay Trail. Through the planning efforts of this Feasibility Study, the communities voices have been solicited and heard, and City Council actions taken. The original four concept alignments and future trail have been narrowed down to only one Bay Trail spine, the Preferred Alignment, formerly called Bay Trail Option 2. The future trail spine and/or spur is also a long term potential, secondary to the development of the Preferred Alignment.

The Preferred concept alignment and "future trail spur and/or spine" alignment cross wetland areas and utility easements, and are affected by the potential re-activation, widening and realignment of the rail within the Dumbarton Rail Corridor. Due to many factors, including the on going environmental clean up efforts of the Cargill Salt pond, environmental restoration efforts, regional transportation planning efforts of the rail corridor, individual planning efforts of neighboring stakeholders, and undocumented sensitive habitat areas and species, further planning efforts and biological research are needed. Only then, will this specific trail reach potentially be implemented, if still feasible, closing this gap in the San Francisco Bay Trail.

Enthusiastic planning efforts and outreach for potential development of this trail should be continued. This Bay Trail reach will provide a local and regional amenity for public access providing recreational, non-motorized transit, and educational opportunities at the edge of the San Francisco Bay's ecological habitat. The vision to create Bay Trail with a Bay "experience" is one step closer to completion.

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Acknowledgements

Association of Bay Area Governments (ABAG)

Bay Trail Staff
John Brosnan, Bay Trail Planner
(Laura Thompson, Project Manager)
(Janet McBride, Project Manager)
Melissa Barry, Bay Trail Planner
JoAnna Bullock, Grants Administrator

Coastal Conservancy
Joan Cardellino, Access Program Manager

City of Menlo Park

Mayor Lee B. Duboc
Mayor Pro Tem Mickie Winkler
Paul J. Collacchi, council member
Nicholas P. Jellins, council member
Chuck M. Kinney, council member

David Boesch, city manager

Department of Transportation
Jamal Rahimi, transportation manager
Rene Baile, P.E., transportation planner
(Dino Teddyputra, transportation planner)

Bicycle Commission
John D. Fox, chair
Peter Fechheimer, vice chair
Sandy Napel
David Roise
Robert H. Cronin
Kurt Servos
Christine Griffin
(Joe Fantuzzi)

City of East Palo Alto

Mayor Donna Rutherford
Vice Mayor David E. Woods
Patricia Foster, council member
Duane G. Bay, council member

Alvin D. James, city manager

Community Services
Meda Okelo, manager

Community Services, Recreation Division
Audree V. Jones-Taylor

Economic Redevelopment
Carlos Marinez, manager

Public Works
Charles Bergson, manager

Public Works, Planning Division
Dario Brown

Task Force Committee

Janet McBride, ABAG
(Melissa Barry, ABAG)
Rene Baile, City of Menlo Park
(Dino Teddyputra, City of Menlo Park)
Maureen Barry, San Francisco Public Utilities Commission
(Kirit Bavishi, San Francisco PUC)
Dana Bland, Dana Bland & Associates
Joan Cardellino, California State Coastal Conservancy
Lloyd Dakin, general public
Bob Douglas, C.E., Cargill Salt
(Lori Johnson, Cargill Salt)
Bob Emert, San Mateo County Trails Committee
Brian Fletcher, Callander Associates

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Task Force Committee (continued)

Stefan Galvez-Abadia, Caltrans District 4, Office of Natural Resources & Permits
Sam Herzberg, San Mateo County, Envrionmental Services, Parks & Recreation Division
Brett Hondorp, Alta Planning + Design
Amy Hutzel, San Francisco Bay Program, California Coastal Conservancy
Jeff Jenson, Caltrans District 4, Office of Environmental Planning
Dick Dahllof, San Mateo County Transit District
(Jane Lockwood, San Mateo County Transit District)
Lily Lee, City of East Palo Alto
Joe Leclair, BCDC
(Ellen Miramontes, BCDC)
Clyde Morris, Don Edwards SF Bay National Wildlife Refuge
Ana Ruiz, Mid-Peninsula Regional Open Space District
Audrey Rust, Peninsula Open Space Trust
Wendy Swenson, Callander Associates
Dani Weber, Peninsula Bicycle Pedestrian Coalition
Steve Willoughby, Pacific Gas and Electric Company
Sany Wong, City/County Association of Governments
(Walter Martone, C/CAG San Mateo County)

Regulatory Agencies

Bay Conservation and Development Commission (BCDC)
Leslie Lacko

California Department of Fish and Game
David (Dave) Johnston, environmental scientist
Scott Wilson, habitat conservation supervisor

California Regional Water Quality Control Board
Habtemariam Kifle, water resources control engineer
Brian Wines, water resources control engineer

U.S. Army Corps of Engineers, San Francisco District, Regulatory Branch
Ed Wylie, chief, south section
Andrew Muss, ecologist

U.S. Fish and Wildlife Service
Robert W. Floerke, regional manager, central coast region
Jim Browning, senior fish and wildlife biologist

Subconsultants

Callander Associates Landscape Architecture, Inc.
Brian Fletcher, principal-in-charge
Wendy Swenson, planner

Alta Design + Planning
Brett Hondorp, planner

Dana Bland & Associates
Dana Bland, wildlife biologist

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