

1 Introduction

Marin County commissioned Alta/LandPeople to conduct a corridor study of three specific bicycle/pedestrian routes connecting the cities of Mill Valley and Corte Madera (the Study). The scope of the Study is to facilitate planning and public participation and conduct preliminary engineering and design work to identify the relative feasibility of each route. The Study process does not include any commitments to proceed – this would occur later through separate processes. The Study is intended to provide useful information for future discussions and decisions.

The connection between Mill Valley and Corte Madera is a key portion of a 70-mile north-south bicycle and pedestrian route corridor serving the most densely populated area of Marin County and connecting Southern and Central Marin (see **Figure 1-1**). This system will connect to the future SMART rail corridor path system in Larkspur and extend north to Cloverdale in Sonoma County, providing a non-motorized connection from Cloverdale to San Francisco. The routes being studied would connect to the two most highly used bicycle and pedestrian routes in Marin County: the Sandra Marker Trail to the north and the Mill Valley to Sausalito Path to the south. According to the 2008 *Marin County Unincorporated Area Bicycle and Pedestrian Master Plan*, this connection is one of the top priority projects in the county.

Study Team

Senior Transportation Planner Carey Lando led the project for Marin County Public Works Department. The Study consultant team consisted of the following firms and roles:

- Alta/LandPeople, Bicycle and Pedestrian Planning, Lead Consultants;
- Jacobs Associates, Tunnel Engineering Feasibility, Geology;
- LSA Associates, Environmental Studies;
- Nolte Associates, Drainage Analysis, Cost Input; and
- Parisi Associates, Traffic Engineering.

A Technical Advisory Committee composed of local agency staff responsible for transportation planning and improvements met at key intervals in the development of the Study to advise on methodology, options, and to review preliminary products:

- Jill Barnes, Senior Engineer, City of Mill Valley
- Dan Dawson, Principal Transportation Planner, Marin County Public Works Dept.
- Ed Hulme, Superintendent, Marin County Parks and Open Space Dept.
- Debra Sue Johnson, Public Works Manager, Town Of Corte Madera
- Bill Whitney, Associate Project Delivery Manager, Transportation Authority of Marin
- Caltrans District 4 Representative

Notes from these meetings are included in **Appendix J** of the Study.

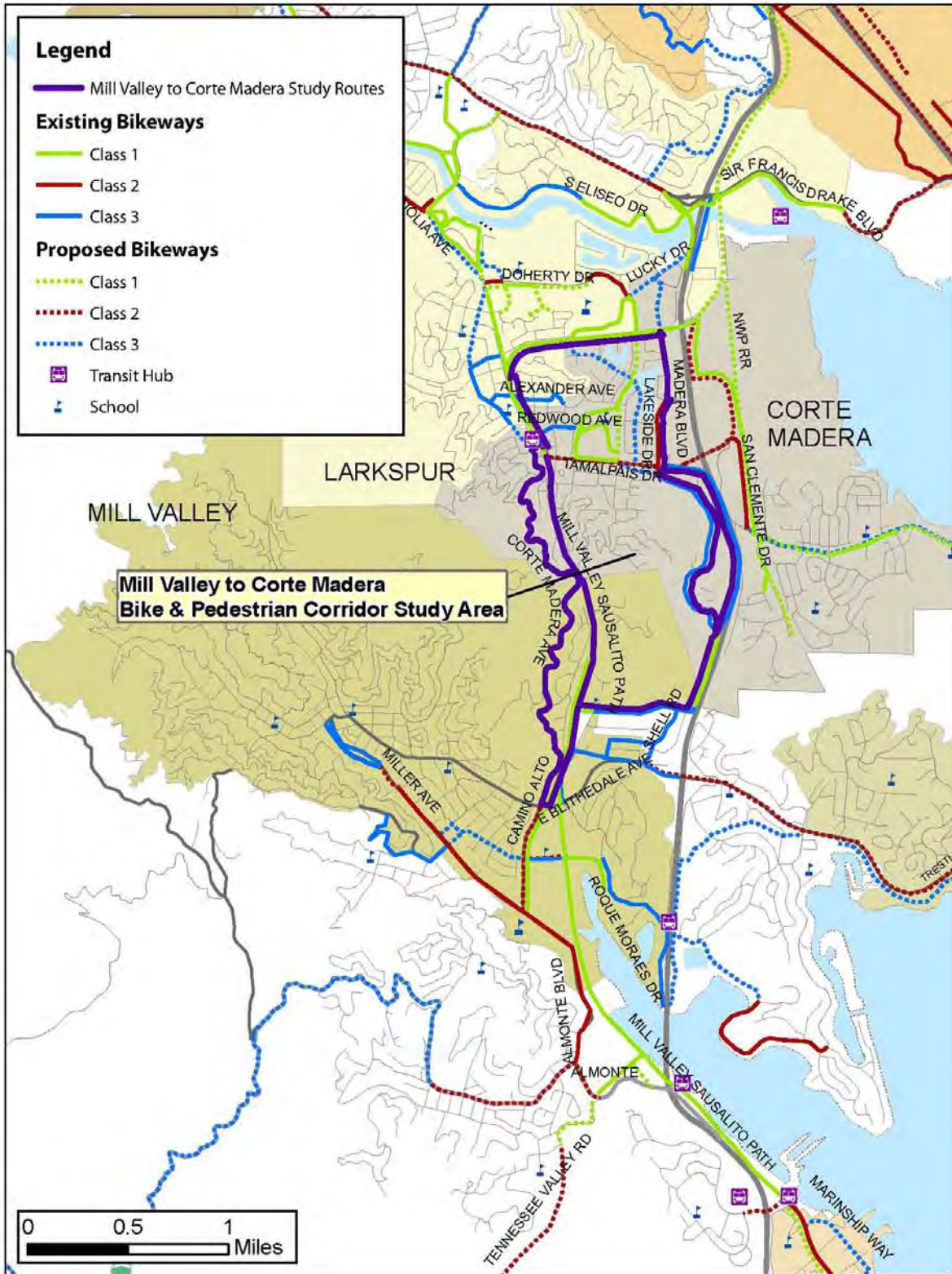


Figure 1-1: Regional Routes Context

Study Process

The first phase of the Study consisted of review of background documents, site reconnaissance and research of technical issues. This resulted in the preparation of a series of technical studies or analyses on subjects pertinent to the use and improvement of the three routes.

The second phase consisted of a public participation program included public notice to known interest groups, and information posted on the County's Walk Bike Marin website and at key points along the existing paths in the Study corridor.

An initial public workshop, held March 4, 2009, was attended by approximately 170 persons. The workshop included a presentation by County staff and the consultant team of the study objectives and process and existing conditions along the route. This workshop provided an opportunity for public comments and questions regarding the Study. The public had the opportunity to provide comments during a follow-up period of approximately one month. Workshop and follow-up comments were carefully considered in preparation of this Study. They are summarized in Appendix J of the Study.

The third phase consisted of preparation and refinement of conceptual improvement plans, descriptions, and estimates. This was based on study of existing conditions along the routes, input from the public and the Technical Advisory Committee, and analyses of significant technical issues. The Study team collaborated to describe specific improvements that could be made along the routes to better accommodate bicyclists and pedestrians, including people with disabilities, and address issues identified in the prior phases. The resulting conceptual improvement projects were evaluated to compare their performance against criteria that reflected the issues of concern. Construction and ongoing maintenance costs and steps to implement the projects were identified at a general level, consistent with a planning-level study.

The fourth and final phase of the Study was public review of the draft products, and revision in response to comments. Comments and responses are summarized in Appendix J.

Executive Summary

The Study addresses three routes: Route A - the Horse Hill/Casa Buena Route, Route B - the Alto Tunnel route, and Route C - the Camino Alto/Corte Madera Avenue route (see Figure 1-2). The limits of all three alternatives were the same – the Mill Valley-Sausalito Multi-Use Path intersection with East Blithedale Avenue at the south, and the Sandra Marker Trail portion of the North/South Greenway at Madera Avenue at Wornum in the north.

Each route was divided into segments based on geography and changes in the type or nature of the road or path facility. The segments were evaluated based on field studies, mapping and analysis of Geographic Information System (GIS) data provided by the Marin County, and through several subject-specific technical analyses.

The objectives of the Study were to identify appropriate improvement concepts for each of the three study routes to accommodate bicyclists and pedestrians, and provide a thorough analysis of all the technical issues associated with the improvements. The improvement concepts reflect careful consideration of extensive input received from the public at and after the two Study workshops, and input from agency staff on the Technical Advisory Committee. Each of the three routes was studied equally, and although they are compared based on selected evaluation criteria in section 3 of the Study, there is no intent to select a preferred alternative. It may ultimately be appropriate to improve two or even all three of the routes. The information in this Study is provided as part of the basis for

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future discussion and decision-making. Cost estimates, which are detailed in Section 4, are very preliminary planning-level costs reflecting a number of assumptions about the improvements and the construction requirements.

Improvement Concepts

On All Routes

Additional traffic control and warning signs, route wayfinding signs, and milepost signs/markers (costs included in individual segment and route estimates).

Route A – Horse Hill Route

East Blithedale Avenue (segment 11A): Minor improvements at the existing Mill Valley to Sausalito Path to make it easier for bicyclists and pedestrians to cross (serves all 3 routes). Potentially a future bike/pedestrian undercrossing or overcrossing at this point

Existing multi-use path north of East Blithedale (segment 1): Add a parallel pedestrian path along the existing path and designate the existing path for bikes; add a ramp from the path to Ashford, similar to the existing ramp near Maguire Elementary School

At Maguire Elementary School (segment 2A): Add a segment of multi-use path to bypass the current route through the school parking lot.

Lomita Drive (segment 2B): Extend sidewalks and a pedestrian path along the north side, to Shell, and along the south and east side of Lomita from Shell to the Horse Hill Path, and associated crossing improvements for the pedestrian path. Striping and signage improvements for bicyclists on the existing designated route along Lomita.

Horse Hill Path (segment 3): Widen path and provide improved crash and headlight glare barriers to improve the function and aesthetics of the route. Option to create sunken and raised pathway segments to slightly reduce grades and increase sense of separation from freeway traffic.

More direct path connection to Meadowsweet Drive to eliminate U-turn currently required for bikes to access.

Meadowsweet Drive (segment 4A): signing and marking improvements for this existing designated bike route, and minor localized shoulder widening and center striping at curves. Adding pedestrian facilities is not seen as feasible due to topography, vegetation and adjacent private improvements, or warranted by existing pedestrian use or demand. Sidewalks exist on the northern portion.

Casa Buena Drive (segment 4B – alternative to 4A): widen shoulder to provide bike lanes on the southern portion, and widen to provide wider striped shoulders on the northern portion (widening to provide full bike lanes would require reconstruction of existing sidewalks and potential impact on private improvements and is not considered warranted). The far northern east-west portion already has bike lanes. Adding pedestrian facilities on the southern portion is not seen as feasible due to topography, vegetation and adjacent private improvements, or warranted by existing pedestrian use or demand.

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Sanford Street (segment 5): widening of intersection from Meadowsweet to Tamalpais to provide bike lanes and adding a crosswalk at Meadowsweet (part of separate study Greenbrae/Highway 101 Corridor Study by TAM).

Madera Boulevard and Tamal Vista Boulevard to existing Sandra Marker Trail (segment 6): Stripe and sign for Class II bike lanes from Tamal Vista north; future ADA upgrades to sidewalks and driveways. (part of separate study Greenbrae/Highway 101 Corridor Study by TAM)

Estimated cost

Route 4A or 4B: \$4.4 - \$5.5 million

Sunken Path Option: \$9 - \$10.2 million

E. Blithedale Separated Crossing: add \$3.4 - \$4 million

Route B – Alto Tunnel Route

Railroad route from Vasco Court to Alto Tunnel (segment 7): trim and remove some native trees and vegetation; improve or construct drainage ditches to convey runoff from above the tunnel portal to nearby Sutton Manner Branch Creek; construct a 10' wide bike path and parallel 8' wide pedestrian path, with emergency vehicle turnaround as close as possible to the tunnel; construct gates, bollards, signs, fire hydrants and related safety features at the tunnel portal.

Alto Tunnel (segment 8): Monitor and protect existing structures nearby by underpinning, building retaining structures, and/or grouting. Remove plugs and fill in tunnel and place steel and concrete supports and shotcrete (sprayed concrete) liner to provide clear interior dimensions 13 feet wide by 16 feet tall and pave a 12' wide multi-use pathway. Provide safety and security features as recommended by Public Safety personnel.

Railroad route from Alto Tunnel to existing path near Montecito Drive (segment 9A): trim and remove some native trees and vegetation, install subsurface storm drains to convey runoff from above the tunnel portal to nearby storm drain system; construct 10' wide bike path and parallel 8' wide pedestrian path.

Existing sidewalk/path along railroad route to Redwood Avenue (segment 9B): Reconstruct to widen existing 8 foot sidewalk to a 12 foot multi-use path (requires transitioning from the separate pedestrian and bike paths proposed to the south). Construct bypass path around bus shelter at north end of existing path (absorbs a few existing parking spaces along Montecito Drive). Provide high-visibility crosswalk at Redwood Ave.

Railroad route along Montecito Drive and through parking area and along existing Sandra Marker Trail (segment 10): Construct a 12' wide path through the parking area to connect to the existing Sandra Marker Trail by widening the existing planting strip and adding 2 crosswalks. Add a parallel pedestrian path along the existing Sandra Marker Trail and designate the existing path for bikes.

Estimated Cost

\$46 - \$56 million; E. Blithedale Separated Crossing: add \$3.4 - \$4 million

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Route C – Camino Alto/Corte Madera Ave. Route

Improvements to East Blithedale crossing (segment 11A) as noted above, plus:

Short connection along E. Blithedale Avenue from the existing Mill Valley – Sausalito Path to Camino Alto (segment 11): no significant improvements.

Along Camino Alto Road from the intersection of E. Blithedale Avenue to Mill Valley/Corte Madera city limit (segment 12A and 12B): Widen, primarily on the west side, involving some retaining walls, and re-stripe to provide either two 5 foot wide bike lanes (City of Mill Valley policy preference) or a single 8 foot wide bike climbing lane on the east/uphill side with a slightly wider west shoulder. The lane(s) would need to be slightly narrower on the northern portion of the route due to steeper topography and adjacent native vegetation. As an option, extend existing sidewalks near Overhill Road south to E. Blithedale. Adding separate pedestrian facilities on the northern portion is not seen as feasible due to topography and adjacent native vegetation, or warranted by existing pedestrian use or demand.

Along Corte Madera Avenue from Mill Valley/Corte Madera city limit to and along Redwood Avenue (segment 13A and 13B): widen to provide room for approximately 5 foot wide bike climbing lane on the west/uphill side on the narrow and winding portion. Reconstruct existing informal path along the west side. Potentially narrow vehicle lanes to provide 5 foot bike lanes on the lower, northern portion of Corte Madera Avenue and on Redwood Avenue

Railroad route along Montecito Drive and through parking area and along existing Sandra Marker Trail (segment 10): improvements as noted above under Alto Tunnel Route.

Estimated Cost

\$4.6 million

With sidewalk extension to Overlook Road: \$5.5 million

E. Blithedale Separated Crossing: add \$3.4 - \$4 million

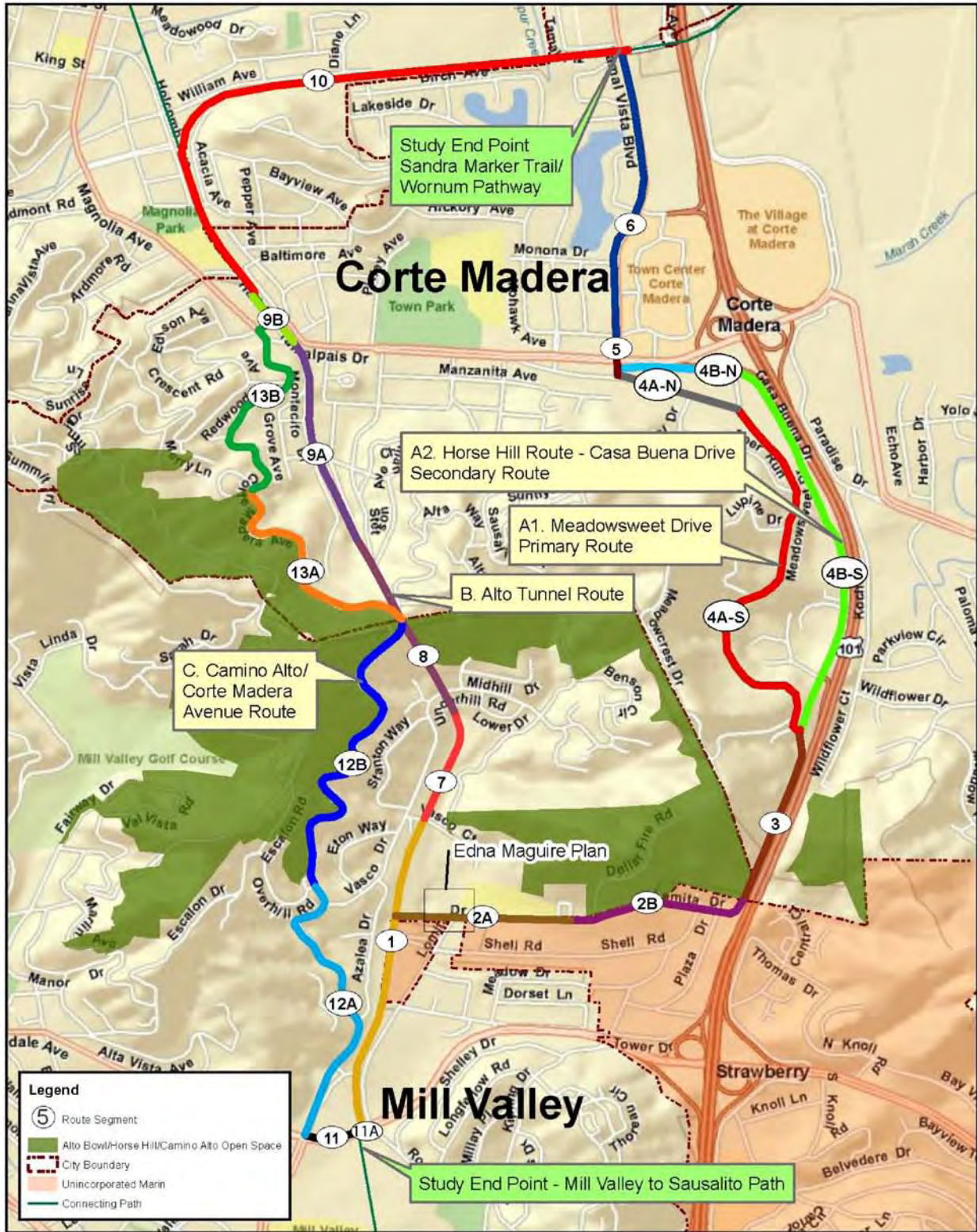


Figure 1-2: Study Area Routes and Segments

Organization of the Report

The Study Report includes this Introduction, and the following sections:

- **Section 2, Improvement Concepts**, describes general and site-specific issues and specific conceptual improvements to the three alternative bicycle and pedestrian routes;
- **Section 3, Alternatives Evaluation**, summarizes and contrasts the alternative improvement projects against a set of criteria that include issues raised in public and agency comments. It is organized in a matrix format that facilitates comparison;
- **Section 4, Cost Estimates**, provides planning-level cost estimates for the alternatives and options, including planning, design, environmental, administration, construction; and operation and maintenance.
- **Section 5, Implementation**, includes potential steps and phases to implement the alternative route improvement conceptual projects.

A series of separate technical study and background documents were prepared for the Study. They are summarized in Sections 1.6 and 1.7.

Appendices – Technical Studies

- Geotechnical Study (Appendix A)
- Tunnel Feasibility Study (Appendix B)
- Drainage Analysis (Appendix C)
- Multi-Modal Traffic Analysis (Appendix D)
- Emergency Response Analysis (Appendix E)
- Environmental Considerations Study (Appendix F)
- Right-of-Way Conditions Analysis (Appendix G)
- Route Use Counts and Projections (Appendix H)

Appendices – Background Information

- Inventory and Description of Routes (Appendix I)
- Public and Agency Comments and Response Summary (Appendix J)
- Background Documents (Appendix K)
- Detailed Cost Estimates (Appendix L)

Types of Bicycle and Pedestrian Facilities

The Study uses specific terminology to describe types of bicycle facilities that might be created or improved along the three routes. Three types of bikeways are identified by Caltrans in Chapter 1000 of the Highway Design Manual. These types, and variations that are used in this Study, are described below, and illustrated in Figure 1-3:

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Class I Bikeway - Typically called a “bike path,” a Class I bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway. The Highway Design Manual specifies the dimensions and geometry of Class I bikeways precisely, but the term is also applied to multi-use paths outside of Caltrans jurisdiction that do not necessarily meet these specific design specifications, but are paved paths at least eight-feet wide that are shared by bicyclists and pedestrians.

Class II Bikeway - Often referred to as a “bike lane,” a Class II bikeway provides a striped and stenciled lane for one-way travel on a street or highway. Per Caltrans standards, there will typically be a bike lane on each side of the street for travel in the same direction as motor vehicle traffic. A non-standard alternative is to provide a bike lane, or “climbing lane,” only on the uphill side of a steep grade, and allow bicyclists to share the lane with motor vehicles on the downhill side, where they are better able to keep up with traffic.

Class III Bikeway - Generally referred to as a “bike route,” a Class III bikeway provides for shared use with motor vehicle traffic and is identified only by signing. Optional Shared Roadway Bicycle Marking pavement stencils are also available for use on Class III bikeways.

It is important to note that bicycles are permitted on all roads in the State of California (with the exception of access-controlled freeways). The designation of certain roads as Class II or III bicycle facilities is not intended to imply that these are the only roadways intended for bicycle use. Rather, the designation of a network of Class II and III on-street bikeways recognizes that certain roadways are optimal bicycle routes, for reasons such as directness or access to significant destinations

Pedestrian Facilities - Creation of separate pedestrian facilities is also included in the Study. These include concrete sidewalks with curb and gutter, and asphalt paved (A.C. or Asphaltic Concrete) paths. Sidewalks or paths are typically at least five-feet wide and must include suitable surface, curb ramps, maximum slopes and other design details to comply with standards for access to people with disabilities set by the Americans with Disabilities Act (ADA) and pertinent California access laws. Class I bikeways that are multi-use paths must also meet these standards. The maximum slope standards do not apply when the route abuts a road that has a gradient exceeding the standard.

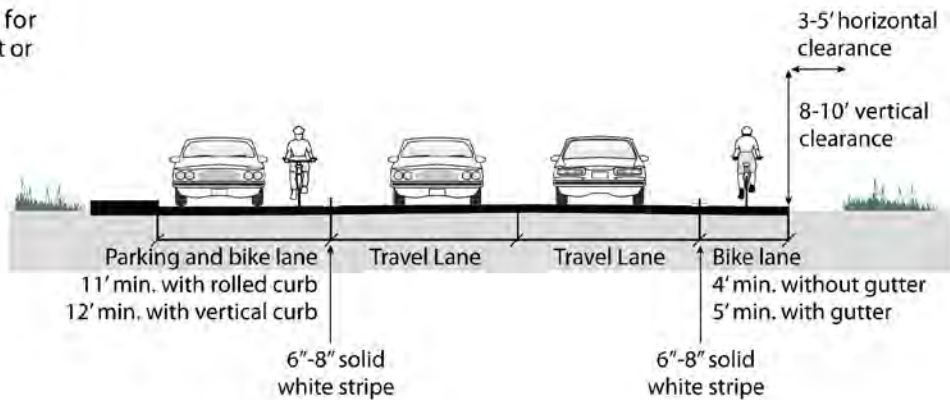
**CLASS I
Multi-Use Path**

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



**CLASS II
Bike Lane**

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



**CLASS III
Bike Route
Signed Shared Roadway**

Provides for shared use with pedestrian or motor vehicle traffic, typically on lower volume roadways.

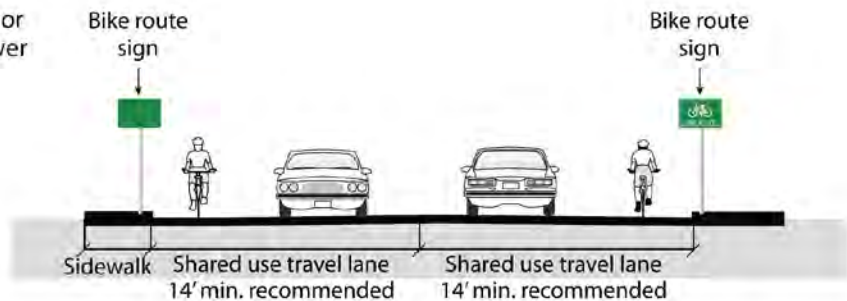


Figure 1-3: Caltrans Bikeway Classifications

Technical Studies Summary

Eight separate but coordinated technical studies were prepared by the Study team to identify and address the technical issues and develop conceptual designs for improvements along the three alternative routes. The scope of each study is summarized below. The complete study documents are provided in the Appendices of the Study Report. The results of these studies are reflected in the Improvement Concepts in Section 2 and the Alternatives Evaluation in Section 3.

Geotechnical Study (*Appendix A*)

Jacobs Associates prepared a geotechnical study to provide part of the basis for development of conceptual tunnel rehabilitation recommendations. This study consisted of review of existing data, including published and unpublished geologic maps and geotechnical reports, as well as review of the 2001 Alto Tunnel Scoping Study prepared by Jacobs Associates. Jacobs Associates conducted geologic field reconnaissance above the tunnel, including mapping of portals and approaches to the portals to gather data on rock properties, such as joint orientations and rock mass classification. The study included data regarding the Marin Municipal Water District (MMWD) Camino Alto Tunnel (a water supply tunnel), which lies 170 feet above, and parallel to, the Alto Tunnel. This provided geotechnical information for the middle third of the Alto Tunnel, which is currently inaccessible. Jacobs Associates had previously performed a limited inspection of the construction shafts of the water tunnel, and has remotely photographed the railroad tunnel.

Tunnel Feasibility Study (*Appendix B*)

Jacobs Associates prepared conceptual designs for tunnel rehabilitation based on the Geotechnical Study. The conceptual designs for tunnel stabilization developed by Jacobs Associates in the 2001 Alto Tunnel Scoping Study were applicable for pathway use, subject to slight modification. Issues and solutions for developing the surface routes from the existing paths to the tunnel portals were also assessed.

In addition to a safe process and result for the structural rehabilitation of the tunnel, key design objectives included ventilation systems for the tunnel; lighting, fire detection and suppression, emergency communications, security and remote surveillance for the tunnel, development of the portal area slopes for long term stability and low maintenance requirements, and developing safe transitions between the surface corridor and the tunnel corridor by considering adequate sight distances and surface transitions. Available utility maps were also reviewed for overhead, surface and underground utilities which could impact the permitting or construction.

The Tunnel Feasibility Analysis also included evaluation of need and potential scope and cost to prepare a future Hazardous Materials Corridor Study (HM Corridor Study) for the potential re-opening of the Alto Tunnel. The primary potential source of hazardous materials will be the old creosote-soaked timbers, roadbed and water within the tunnel. The HM Corridor Study Determination is a subset of a Phase I environmental site assessment and is specific to projects where contaminated soil and groundwater may be encountered during construction. The goal of the HM Corridor Study is to identify potential future HM issues and to avoid contamination or assist in locating, quantifying, and negotiating with agencies or disposal facilities to minimize the cost and time of handling any contaminated materials during construction.

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Section 2 summarizes the improvements recommended in Appendix B by Jacobs Associates for the Alto Tunnel and adjacent areas.

Drainage Analysis (*Appendix C*)

Nolte Associates prepared a preliminary drainage analysis to identify locations of problems, their nature and extent, and conceptual design solutions. The tunnel portals areas both have standing water during wet conditions, and the tunnel itself is expected to be wet due to surface runoff and/or groundwater. There are drainage issues along the Horse Hill and Camino Alto corridors, but these are not significant constraints for these routes and the solutions are relatively standard measures that are incorporated into general improvement concepts. Section 2 summarizes the drainage improvements recommended in Appendix C by Nolte Associates for the Alto Tunnel and adjacent areas.

Multi-Modal Traffic Analysis (*Appendix D*)

Parisi Associates, Traffic Engineers, prepared an analysis to describe conditions on roadways associated with the alternative routes between Mill Valley and Corte Madera, to summarize reported collisions involving pedestrians and bicyclists along these routes, and to provide a preliminary list of potential multi-modal solutions to address existing deficiencies. The scope includes analysis of available crash data, existing and projected traffic volumes, speeds, potential traffic operations, and sight distance constraints. The analysis evaluated alternatives for improvement of bicycle and pedestrian access across and along streets on the routes, including intersection, travel lane, bike lane, and pathway configurations. These improvement concepts are reflected in Section 2.

Emergency Response Analysis (*Appendix E*)

Parisi Associates and Alta/LandPeople prepared an analysis detailing strategies for emergency response for the three alternative routes, primarily focused on the Alto Tunnel Route, which is the only new route among the three alternatives, and because of the unique conditions and challenges of a tunnel route. The analysis was based on the Project Team's past experience with similar bicycle and pedestrian route projects, including routes in tunnels, field reconnaissance of the study routes, interviews with the Study Area's Emergency Service Departments, and interface with the parallel Tunnel Feasibility Study.

To better understand the needs, questions, and recommendations of the area's emergency services, the Project Team held two meetings with the County of Marin, Corte Madera Fire Department, Twin Cities (Corte Madera and Larkspur) Police Department, and Mill Valley Police Department. Notes from these meetings are included with the Emergency Response Analysis and reflected in the Improvement Concepts in Section 2.

Environmental Considerations Study (*Appendix F*)

LSA Associates prepared a preliminary study of environmental considerations for the alternative routes. This was not a formal environmental document, which is not required for a planning study, but was intended to provide information about environmental issues and processes that may be required if the improvement concepts for any of the routes were pursued. The scope included background research and a biological field survey to identify potential significant adverse impacts to

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environmental resources that could occur along the three alternative alignments. LSA reviewed available documents pertaining to the bike and pedestrian corridor and conducted field visits to identify potential environmental issues and constraints. LSA conducted a biological resources assessment to identify any significant adverse impacts to biological resources and special status species using available material; obtained a list of special status species from the U.S. Fish and Wildlife Service (USFWS); and queried the California Natural Diversity Data Base and California Native Plant Society Online Database. LSA also conducted a cultural resources study consisting of a records search of the project area, a literature and cultural resources inventory review, and consultation with the Native American Heritage Commission (NAHC).

After the conceptual improvements for the three alternative routes were confirmed, LSA completed a preliminary Initial Study checklist and summary of potential impacts for each of the alternatives proposed in the Corridor Study. The summary generally identifies anticipated environmental documentation, technical studies, surveys, clearances, agency coordination and required permits associated with the alternatives, based on current knowledge.

Right-of-Way Conditions Analysis (*Appendix G*)

Alta/LandPeople prepared an analysis summarizing right-of-way conditions for the Alto Tunnel Route based on information available from the County of Marin, the Northwest Pacific Railroad Historic Society and other sources. According to parcel data available from Marin County, the Alto Tunnel passes through several parcels. Some portions of the route, including the tunnel, are on/under private parcels. Some portions are on/under property owned by the County as part of the railroad right-of-way purchase, or owned by the two cities as street right-of-way.

Based on the results of right-of-way research, a process of negotiation, documentation and purchase would be conducted for any necessary right-of-way acquisition.

Route Use Counts and Projections (*Appendix H*)

An analysis was prepared by Alta/LandPeople to estimate the potential number and variety of recreational and commuting users of the three routes if the conceptual improvements were implemented.

Alta/LandPeople conducted bicycle and pedestrian counts at each end of the study corridor during the hours of peak usage. These were supplemented with two sets of counts taken from the 2008 Transportation Authority of Marin counts and Non-motorized Transportation Pilot Program (NTPP).

Based on the counts, and using the established methodology for estimating use of bicycle and pedestrian routes, an estimate of current use of the two existing routes was prepared, and presented with use information for adjacent paths (see **Table 1-1**).

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Table 1-1: Project Area Estimated Existing Average Daily Traffic (ADT)¹

Location	Facility Type	ADT	Pedestrians	Bikes
Camino Alto	Road	981	157	824
Horse Hill Path	Class I-III	414	66	348
Mill Valley-Sausalito Path	Class I	3,209	642	2,567
Larkspur-Corte Madera Path	Class I	1,289	258	1,031

Estimates of projected use of the new and improved facilities were then prepared, including informed judgments about the allocation of projected regional increased use among the three facilities. A Low-Range Estimate (see Table 1-2) and a High-Range Estimate (see Table 1-3) were prepared.

The Low-Range Estimate is conservative in that it does not consider the growth in bicycle and pedestrian use in Marin County since 1999. It is estimated that a daily average of approximately 380 bicyclists and 72 pedestrians would use the Horse Hill Path, or a 10% increase from the number currently estimated to be using this route. Though some improvements are recommended for this route, many of the constraints (circuitous, next to highway) cannot be overcome with new improvements.

An estimated daily average of approximately 1,863 bicyclists and 466 pedestrians would use the Alto Tunnel based on the assumption that the volume of bicyclists and pedestrians would be approximately half the volumes on the Mill Valley-Sausalito Pathway and the Sandra Marker Trail in Larkspur.

An estimated daily average of approximately 1,036 bicyclists and 197 pedestrians would use the Camino Alto/Corte Madera Avenue Route based on the assumption that there will be a 25% increase over current estimated annual volumes with the completion of climbing lanes or bicycle lanes and related improvements that will attract new bicyclists and pedestrians.

To forecast the reduction in vehicle miles travelled (VMT), the percentage and length of transportation-related trips was estimated based on NTPP survey results. Pedestrian transportation trips are assumed to be 1.5 miles long and bicycle transportation trips are assumed to be 10 miles long. As shown in Table 4, the Alto Tunnel is estimated to save the most VMT of the three alternatives. These VMT savings are totals, rather than net – they show the relative benefit of the three alternatives assuming all were improved, compared to a baseline of zero.

¹ ADT is the annual estimate divided by 365, or the number of days in a year.

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Table 1-2: Lower Range Estimated Annual Users, Average Daily Traffic (ADT) and Benefits

Daily Use and Benefits

Location	Facility Type	Annual Estimate	Transportation Purpose				VMT Saved
			ADT	Pedestrians	Bikes	Purpose	
Alto Tunnel	Class I	850,000	2,329	466	1,863	894	7,201
Camino Alto	Class II	450,000	1,233	197	1,036	470	3,962
Horse Hill Path	Class I-III	165,000	452	72	380	172	1,453

The High-Range Estimate takes into account growth in Marin County bicycle and pedestrian use. It uses a growth factor derived from the County of Marin's October 2009 Non-motorized Transportation Pilot Program Summary of 2007, 2008, and 2009 Bicycle and Pedestrian Counts and Surveys. This growth reflects increased bicycling and pedestrian activity for recreational and health purposes and well as transportation mode shift. Between 1999 and 2009 the average percent change in bicycle and pedestrian use in the project study area was 81%. Assuming this trend continues at the same rate, and that the Alto Tunnel is opened for use in five years, the bicycle and pedestrian use in the study area would be 40.5% higher than 2009 levels, or half of the ten year change.

Table 1-3: Higher Range Estimated Annual Users, Average Daily Traffic (ADT) and Benefits²

Daily Use and Benefits

Location	Facility Type	Annual Estimate	Transportation Purpose				VMT Saved
			ADT	Pedestrians	Bikes	Purpose	
Alto Tunnel	Class I	1,850,000	5,068	1,014	4,055	1,946	15,672
Camino Alto	Class II	625,000	1,712	274	1,438	653	5,503
Horse Hill Path	Class I-III	230,000	630	101	529	240	2,025

Table 1-3 shows an estimated 1,850,000 annual users would use the Alto Tunnel. This is based on the assumption that the volume of bicyclists and pedestrians using the Alto Tunnel would be 80% of the projected volumes on the Mill Valley-Sausalito Path (1,650,000) and the Larkspur-Corte Madera Path (660,000).

Other Background Information

Three additional appendices contain background information for the Study:

² ADT is the annual estimate divided by 365, or the number of days in a year.

Inventory and Description of Routes (*Appendix I*)

This provides an overview of the routes – their current conditions and the opportunities and constraints for improving them as bicycle and pedestrian routes. Information on conditions relating to the Alto Tunnel, traffic conditions and potential solutions, emergency access and response, potential use levels of the routes, and environmental conditions and issues is provided in the technical studies described above.

Public and Agency Comments and Responses Summary (*Appendix J*)

This summarizes the comments received at the public workshops, in follow-up communications, and at meetings of the project Technical Advisory Committee, and provide summary responses to public and agency comments.

Background Documents (*Appendix K*)

This reviews the significant regional and local plan and policy documents that provide context for the Corridor Study.

Detailed Cost Estimates (*Appendix L*)

This provides the detail of planning-level cost estimates for improvements described in Section 2, and in the Tunnel Feasibility Study (*Appendix B*), and Drainage Analysis (*Appendix C*).