



City of Sausalito Ferry Terminal to Gate 6 Road Path Feasibility Study

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1. Introduction

1.1. Project Overview and Purpose

The Sausalito Ferry Landing to Gate 6 Road Path Feasibility Study examines design options for a bicycle and pedestrian connection between the Sausalito Ferry Landing and the Gate 6 Road and Bridgeway intersection. The County of Marin’s Non-motorized Transportation Pilot Program (NTPP) funded this Study. The NTPP is a federally funded project that allocated \$25 million each to four communities nationwide to determine whether increased investments in programs and projects would result in more people walking and bicycling. Marin County was one recipient of these funds.

The purpose of this Study is to review the options for a Ferry Landing to Gate 6 Road bicycle and pedestrian connection in Sausalito and to develop a preferred alignment of the facility while identifying traffic, environmental, land use, and safety constraints.

1.2. Project Study Area

The Project Study Area for the Sausalito Ferry Landing to Gate 6 Road Feasibility Study is primarily located in the City of Sausalito with the northern terminus at Gate 6 Road in County of Marin and Caltrans jurisdiction. As Figure 1-1 shows, the northern terminus is the connection with the Mill Valley-Sausalito Path on the northeast corner of the Bridgeway and Gate 6 Road. The intersection serves as the Highway 101 northbound on-ramp and is operated by the California Department of Transportation (Caltrans). The Plan’s southern terminus is the Ferry Landing where this Plan will link with a project currently under design and soon to be constructed—the Bridgeway to Ferry Landing Improvements. To the west, the project area boundary is Bridgeway and to the east the boundary varies. From the Ferry Terminal north to Johnston Street the project area includes the properties between Bridgeway and the Richardson’s Bay Shoreline. North of Johnson Street the project area is west of the Shoreline closer to Bridgeway along the track alignment of the former North Pacific Coast Railroad.



Bicyclists at the northern terminus of the project Study Area- the Mill Valley-Sausalito Path at Bridgeway and Gate 6 Road

1.3. Public Outreach Process

The Sausalito Ferry Landing to Gate 6 Road Path Feasibility Study had an outreach process that included a Technical Advisory Committee, presentations to City Council, and a project open house.

1.3.1. Technical Advisory Committee

The Project Technical Advisory Committee (TAC) met five times throughout the course of the project to discuss the Study Area’s existing conditions, opportunities and constraints, path alignment options, and

recommended design treatments. The TAC was comprised of five stakeholders including a City Councilmember (Herb Weiner), Transportation Action Committee member (Bonnie MacGregor), Waterfront and Marinship Committee member (Bill Werner), a Marin County Bicycle Coalition representative (David Hoffman), and a local business operator (Tony Tom). There were also other interested parties that attended the project TAC meetings including local residents (Bob Mitchell, Michael Rex, Adam Krivatsy, Kate Flavin, Dorothy Gibson), a County of Marin Department of Public Works engineer (Eric Steger), and a representative from Transportation Alternatives Marin (Patrick Seidler).

1.3.2. City Council

The Feasibility Study was presented to City Council twice during the course of the project. At the first meeting, the project team shared draft recommendations including figures for sections of the proposed path. Comments provided by City Council were then incorporated into the Feasibility Study. The Study was also presented to City Council for adoption.

1.3.3. Project Open House

The City of Sausalito held a public workshop to present and solicit comments on the Draft Ferry Terminal to Gate 6 Road Path Feasibility Study on November 16, 2010 at the City Council Chambers. Approximately 15 members of the public attended the workshop and provided comments on the recommended alignment. Attendees commented on several specific segments including the Ferry Landing and Lot 1 and 2 area, the Dunphy Park area, the Marinship area; and, Gate 5 and Gate 6 intersection considerations. Attendees provided specific alternative design recommendations in follow-up written correspondence that is addressed in **Appendix D: Response to Public Comment on the Draft Feasibility Study**.



Figure 1-1 Project Study Area

1.4. Goals and Objectives

The overall goal of the Ferry Terminal to Gate 6 Road Path Study is to develop design recommendations for a bicycle and pedestrian connection through Sausalito, linking the Sausalito Ferry Terminal with the Mill Valley-Sausalito path and Marin County's North-South Bikeway. There are descriptions of this Path in a number of other planning documents (see Chapter 2) and this Study sets specific recommendations for the Path in Sausalito. The importance of this study has grown as the number of bicyclists and pedestrians in Sausalito have increased in recent years.

Specific goals for pedestrians and bicyclists are contained in the City of Sausalito's various planning documents, including the General Plan and Bicycle Plan. Drawing on these existing plans, the following goals and objectives guided the evaluation process in this Study.

Goal 1: Improve bicycle and pedestrian path connectivity in Sausalito from the Ferry Terminal to Gate 6 Road and the Mill Valley-Sausalito Path.

Objective 1.1: Close gaps in existing north-south path facilities.

Objective 1.2: Define and improve the Marin County North-South greenway in Sausalito.

Goal 2: Develop the project to be consistent with adopted policies, standards, and goals.

Objective 2.1: Design the project to be consistent with the local, regional, and State adopted design standards.

Objective 2.2: Design the preferred alternative to be consistent with existing and future local and regional improvement projects.

Objective 2.3: Design the preferred alternative to avoid the Sausalito Shoreline through the Marinship area.

Goal 3: Provide a path for Sausalito residents and employees and bicycle and pedestrian tourists.

Objective 3.1: Enhance bicycle and pedestrian tourist access to Bridgeway and Sausalito businesses.

Objective 3.2: Enhance bicycle commuter access to local employment and shopping along the corridor.

Goal 4: Improve bicycle safety in the project corridor.

Objective 4.1: Minimize conflicts with motor vehicles, especially at intersections and driveways.

Objective 4.2: Maximize separation between bicycles, pedestrians, and vehicles to the extent feasible.

Objective 4.3: Provide for slower moving bicyclists and pedestrians not wanting to use the existing on-street bikeways.

Goal 5: Design the bikeway improvements to enhance the local environment and neighborhoods.

Objective 5.1: Avoid direct impacts to biological, hydrologic, historical and archaeological resources.

Objective 5.2: Minimize impacts to local traffic capacity.

Objective 5.3: Minimize impacts to private property and residential neighborhoods, and avoid the need to acquire right-of-way or easements where feasible.

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2. Planning Context

This section reviews planning and policy documents relevant to this Sausalito Ferry Landing to Gate 6 Road Multi-Use Path Study. These documents describe walking and bicycling policies for Sausalito and describe a north-south path through the City. The purpose of this review is to ensure consistency between this study and previously adopted City policies and plans and to document the previously described options for a north-south bikeway connection through Sausalito. These policies, objectives, and route descriptions present support or guidance for the recommended study alignment.

2.1. General Plan (1995)

The City's General Plan guides development decisions so they reflect the desires of the residents. The General Plan consists of seven elements that address specific implementation policies. The most relevant sections to this study are the Land Use and Growth Management, Circulation and Parking, and Environmental Elements. An Environmental Impact Report (EIR) was prepared to evaluate the potential environmental impacts of the City's 1995 General Plan. The EIR identifies one impact related to Sausalito Ferry Landing to Gate 6 Road Path Study area. Upon full build out of the General Plan, the EIR estimates that peak demand for parking in Downtown occurring on weekend summer days would exceed the 1,100 parking stalls (available in 1995) by 200 stalls. The following General Plan policy measures mitigate this demand increase may be achieved in part by the implementation of the path in this study.

- Work cooperatively with local business interests in developing programs to reduce traffic and parking.
- Reduce reliance on the private automobile by emphasizing alternative modes of transportation.

2.1.1. Circulation and Parking Element

The Circulation and Parking Element ensures that people and goods move about the city efficiently. The Element focuses on reducing traffic, minimizing vehicle parking impacts, and minimizing widening to the existing roadways. Objective 4.0 and Figure 2-1 General Plan Shoreways and Bikeways Plans specifically address walking and bicycling in Sausalito. It states: "Enhance bicycling and pedestrian infrastructure and programs to reduce the use of motorized vehicles within the City and reduce conflicts between bicyclists, pedestrians, and motorists." To implement this overarching objective, the Circulation and Parking Element has a series of policies and programs. The most relevant Policy to this Study is CP-4.2.

- **CP-4.2 North-South Bicycle Route System:** Identify a combination of short-term projects (1-10 years) and long-term projects (1-20 years) to develop a bicycle system from the Golden Gate National Recreation Area (GGNRA) at the south entrance of the City, to the Mill Valley multi-use path at the north City limits, linking residential neighborhoods, commercial and visitor centers, key transportation areas, scenic shorelines with local and regional destinations.

The Circulation and Parking Element recommends both short-term and long-term programs for implementation of this Policy. For the Bridgeway corridor, the short-term includes Class II bike lane striping

where feasible and otherwise Class III bike route improvements from the South City limits to Johnson Street and installing Class II bike lanes along Bridgeway from Johnson Street to the northern city limit. Additionally, a Class I bike path is recommended parallel to Bridgeway from Johnson Street to the northern city limit. A long term recommendations is the construction of a Class I path from Pine Street to the Gate Five Road as a condition of development and by City right-of-way acquisition.

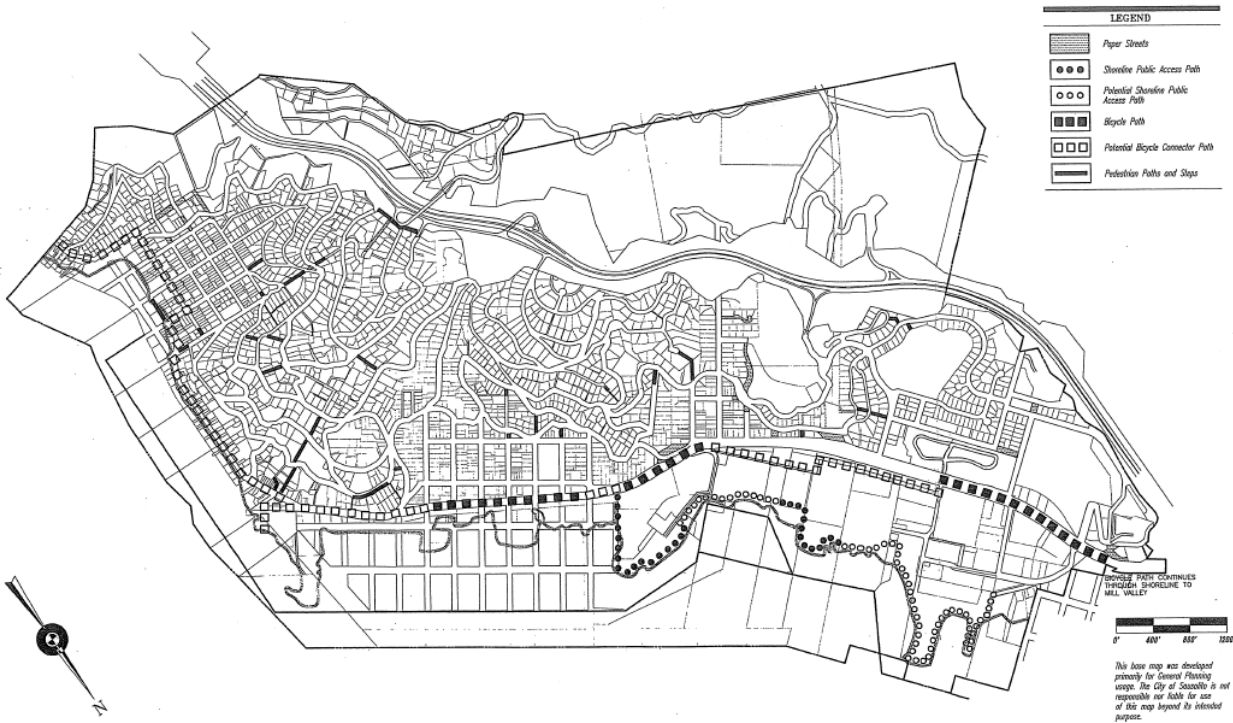


Figure 2-1 General Plan Shoreways and Bikeways Plan

2.1.2. Environmental Quality Element

The Environmental Element presents policies guiding the development of open space, trails and pathways. Objective 2.0 of this element is to maintain and expand the parks and recreational system. While the focus of this multi-use path study is to provide a transportation oriented path, the path will also provide recreation for residents and tourists.

2.2. Marinship Specific Plan (1989)

The Marinship Specific Plan presents development and design standards and details for land uses, circulation, and view corridors in the Marinship area, which is bound by North Bridge Boulevard/Gate 6 Road to the north, Napa Street to the south, Bridgeway to the west, and Richardson’s Bay to the east. Figure 1-1 shows a map of Marinship Specific Plan Area. The intent of this Plan is to “promote the waterfront area and promote

diversified water-dependent uses” and “promote other lands in the Marinship with industrial uses and uses compatible with an industrial area.”¹ Goal 15 of the plan is to “give special attention to the establishment and enhancement of the pedestrian and bicycle paths to and through the Marinship.”

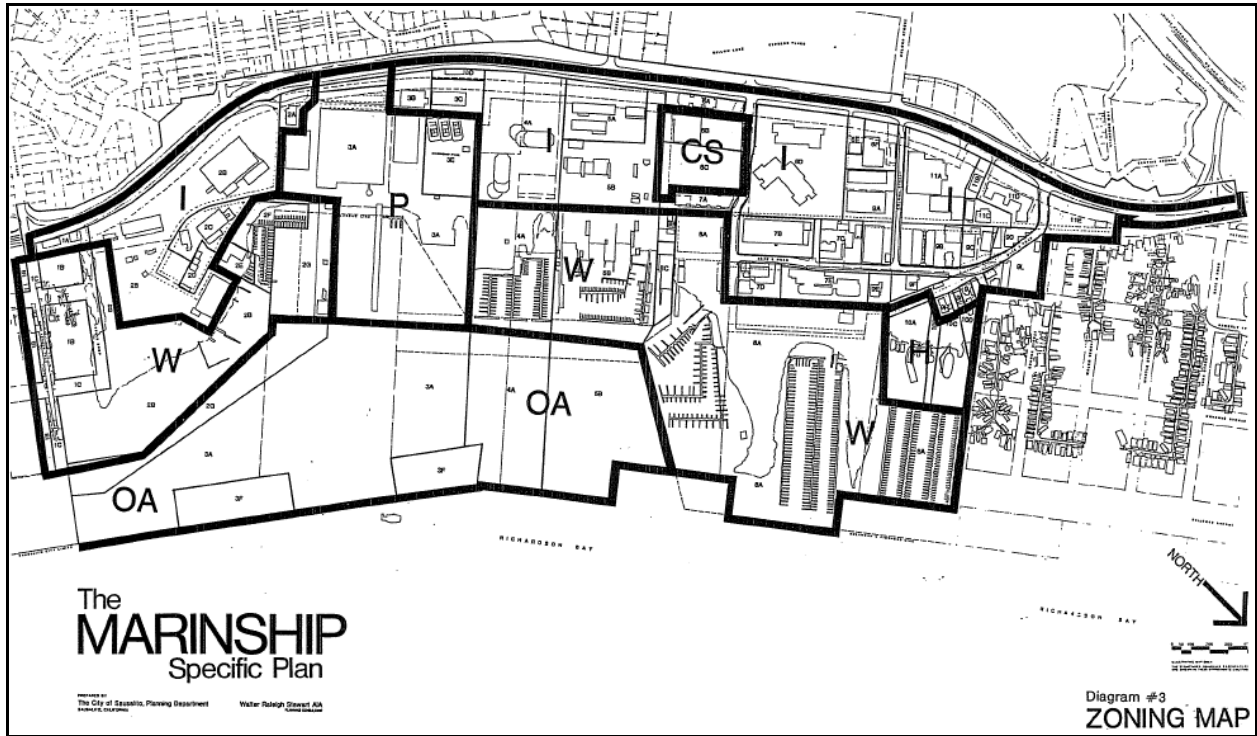


Figure 2-2 Marinship Specific Plan Area

The Specific Plan provides a path system for providing pedestrian access to the Marinship waterfront detouring around active marine industrial areas as shown in Figure 2-3. The Plan describes two pedestrian paths that are required as a part of developments or redevelopments when reasonable if the development plans increase the Floor Area ratio or market value of the parcel 25 percent. A description of the two paths, Path A and Path B, follows:

- **Path A:** Along the foot (toe of slope) of Bridgeway (between Parcels 1A and 1B, western edges of Parcels 2A, 2B, 3A, 3B, between Parcels 3C and 3D, the western edge of Parcels 5A, 5B, and the eastern edge of Parcel 6A). North of this location the path shall follow the existing alignment to the northern City limits.
- **Path B:** Pathways, accommodating both pedestrians and bicycles, shall be provided along Harbor Drive (south side of the street), at the Army Corps of Engineers (Parcel 3A), and along the northern

¹ City of Sausalito “Marinship Specific Plan”

edge of or near Mono Street, in locations considered to avoid potential negative impacts to the marsh restoration project.

- The Marinship Specific Plan for Pedestrians and Bikeways (Figure 2-3) includes a bike path. The Plan calls for an extension and widening of the path on the eastern side of Bridgeway between the northern city limit and Harbor Drive, at Harbor Drive the path connects to Marinship Way. This would connect with three shoreline paths:
 - A route along the southern edge of Harbor Drive between Bridgeway and Parcel 8A
 - A route near Parcel 3A (Army Corps of Engineers)
 - Between Mono Street at Bridgeway and Schoonmaker Point

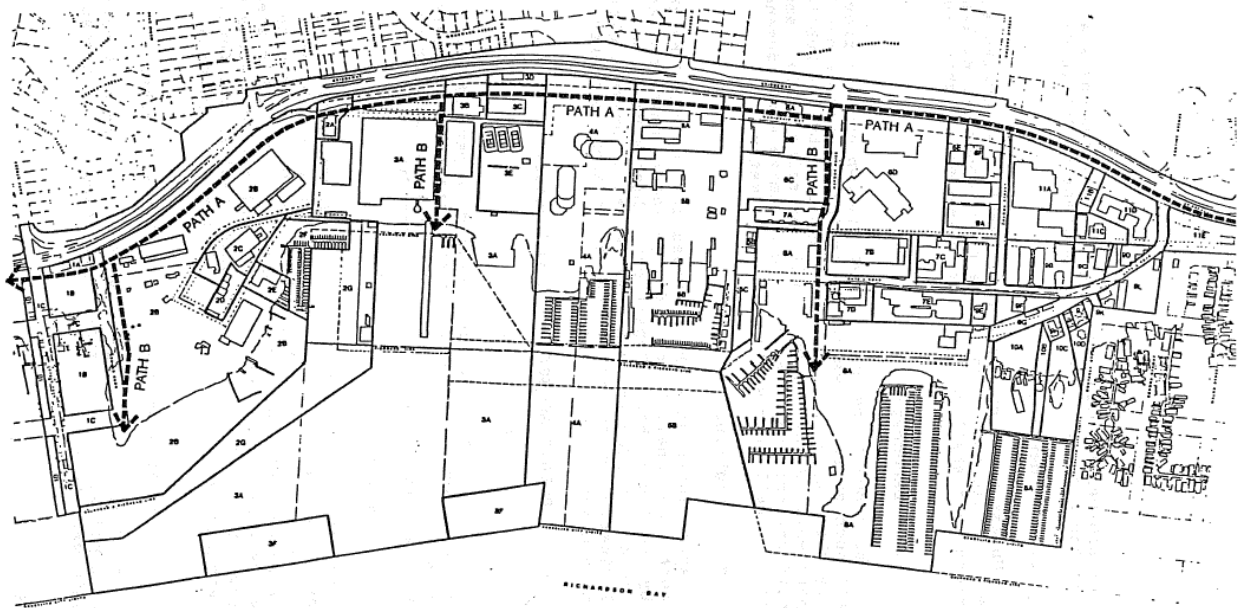


Figure 2-3 Marinship Specific Plan Pedestrian Paths & Bikeways

2.3. Bicycle Master Plan Update (2008)

The most recent update to the Sausalito Bicycle Master Plan was in 2008. The Bicycle Master Plan identifies projects that complete a continuous bicycle network in Sausalito. The development of a pathway between the Ferry Terminal and Gate 5 Road is identified as a long term project and recommended to comply with the Caltrans minimum standard of an eight foot width with two foot wide non-paved shoulders. The Bicycle Plan recognizes that a path entirely off-street may not be compatible with the area's marine industrial land uses and recommends using on-street bicycle facilities in incompatible areas. Potential on-street alternatives are the recommended Class II bicycle lanes on Marinship Way, Harbor Drive and Gate 5 Road. The recommended path is divided into two segments. Segment 1 is from Harbor Drive (near Gate 6 Road) to Liberty Ship Way

and Segment 2 is from Johnson Street to the Ferry Terminal. Segment 1 follows Bridgeway to the east and requires the acquisition of land from existing private properties. Segment 2 follows the former railroad rights-of-way and has similar challenges with the need for property acquisition, additionally its development would require reconstruction of the existing boardwalks that do not have bicycle-friendly surfaces and are not wide enough to accommodate additional bicycle traffic due to high pedestrian traffic on weekends. The Bicycle Plan identifies the most continuous off-street path may follow the shoreline. **Figure 2-4** is a map of the City's existing and proposed bikeways.

2.4. Marin County North-South Bikeway Feasibility Study (1994)

The Marin County North-South Bikeway Feasibility Study's purpose is to identify a safe and feasible bikeway between Marin County cities. The priority of the bikeway is to provide connections for bicycle commuters, putting recreational bicycle use secondary. Three segments of the bikeway travel through the Study Area on Bridgeway South and Bridgeway North.

The short term recommendation for Bridgeway South, from Anchor Street and Napa Street, is to remove the then existing median to make room to stripe Class II bicycle lanes and this recommendation has been implemented. A Class I path following the west side of Humboldt Avenue from Bay Street to Johnson Street and then shifting to the east side of Bridgeway is a long term recommendation.

The short term recommendation for Bridgeway North, from Napa Street to Coloma Street is Class II bicycle lanes and removing the existing bollards in the center of the bike path running adjacent to the east side of Bridgeway. Today along this segment there are existing bike lanes on Bridgeway where feasible and along a portion of the road there are existing Class III bike routes. The long term recommendation is to pave and stripe the existing Class I path from Napa Street to Liberty Ship Way. North of Liberty Ship Way, the Class I path would travel along the former railroad right-of-way as described in the Marinship Specific Plan, immediately south of Harbor Drive, the path would replace a portion of the existing parking lots. Some portions of this Class I path have been implemented in the Marinship Area. At the time of the North-South Feasibility Study, the City owned two of the twenty-two parcels along the proposed path.

North of Coloma Street Class II bicycle lanes are recommended and have been implemented. Additionally, a Class I path is recommended along the east side of Bridgeway where there is currently a sidewalk this proposed Class I path would connect to the Mill Valley-Sausalito Path north of Gate 6 Road).

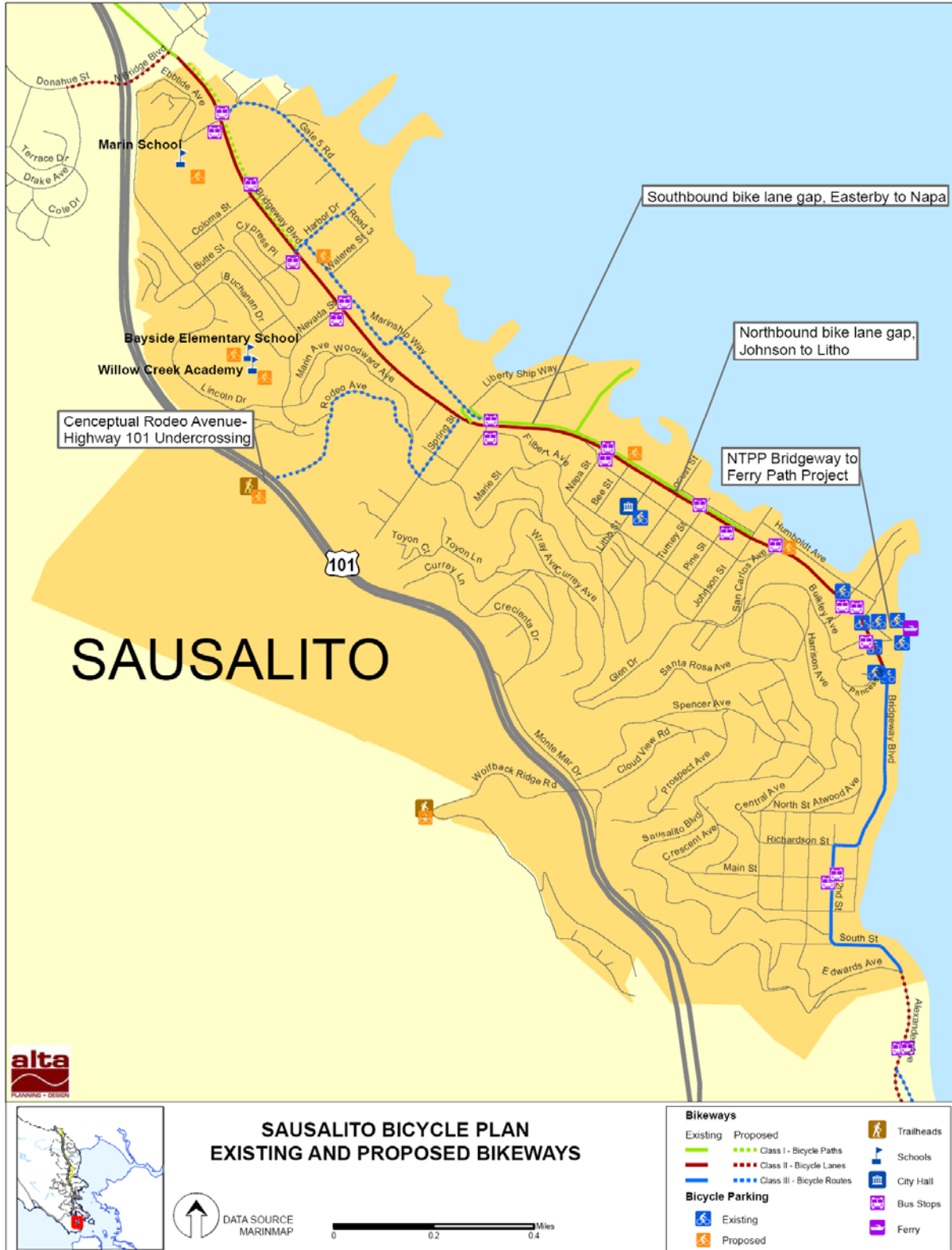


Figure 2-4 Existing and Proposed Bikeways

2.5. Bike Policy for Marin County (1974)

A Bike Policy for Marin County was drafted by the Board of Supervisors in 1975 and call for "safe accommodation for bicycling in all public streets and roads." The Policy call for the County to:

1. Require new road construction and repair projects to be designed to safely accommodate bicycles as well as motor vehicles;
2. Integrate bicycle planning into transportation planning and construction;
3. Provide recreational bikeways along scenic routes and connections between recreation areas;
4. Develop uniform signing and safety standards for bikeway design, construction devices;
5. Support bicycle traffic safety education and skills training programs; and,
6. Support statewide and local legislative efforts to establish bicycle safety rules, and support enforcement and education programs which may be necessary.

The Bike Policy lays out major arterial bicycle routes. Route 1 – Redwood Route travels from Sonoma County to the Golden Gate Bridge and along Bridgeway through Sausalito. Additionally, the Sausalito Ferry Terminal is identified as a bicycle-transit interchange point. The Policy calls for larger scale shelters and theft proof racks.

2.6. Historic District Design Criteria and Guidelines (1993)

In 1981, the Sausalito City Council established a Historic Preservation District, the location of many of the City’s early commercial buildings. This area is centered at the Princess Street and Bridgeway intersection, at the south end of the Study Area. The Sausalito Historic Landmarks Board adopted Historic District Design Criteria and Guidelines in 1993 to define the criteria and the procedures to conserve historic design values. In relation to this multi-use path study and its design, the Historic District Design Guidelines prohibit “shiny metallic” and “bogus” materials that replicate natural materials. When metal framing is required, the historic design guidelines recommend using bronze anodized aluminum.

2.7. Sausalito’s Community Visioning Process – Pedestrian/Bicycle Facilities

Sausalito’s Business Advisory Committee wrote Sausalito’s Community Visioning Process – *Pedestrian/Bicycle Facilities* in May 2007. This report’s objective is to “identify possibilities and means for creating a system of safe and convenient non-motorized circulation within Sausalito.” The vision is to create pedestrian and bike access to the waterfront, downtown, to improve access to hillside residences, and regional trails. The Committee reviewed existing bicycle and pedestrian plans and programs, developed basemaps, surveyed city paths and stairs, identified potential bicycle and pedestrian opportunities, and participated in workshops to identify implementation strategies. The report has a series of recommendations for project implementation. The projects relevant to the Sausalito Ferry Landing to Gate 6 Road Path Study are:

- Build a separate ped/bike path between Litho and Napa Streets, along the inland side of Dunphy Park
- Improve the (inland) walking experience between Marinship Park and Harbor Drive. Provide sidewalks and landscaping on Marinship Way

- Endorse the proposed North/South Greenway, the path system from the Sausalito Ferry Terminal to Gate 6 Road as an alternative route for families to use within Sausalito

2.8. City Resident Survey (2006)

In 2006, the City commissioned Gene Bregman & Associates to conduct a scientific opinion survey to find their preference for improvements to the city. Some questions were asked regarding infrastructure. A sample of 172 residents responded with a 4 to 7 percent margin of error to questions about if more recreational opportunities were needed and the results were that 57 percent selected that there was a “great need”. When asked what transportation improvements were needed, 74 percent selected that there was a “great need” for pedestrian facilities, including multi-use paths and 66 percent selected that there was a “great need” for expanding or improving bicycle facilities. When asked how frequently they would use the improved and expanded bicycle and pedestrian facilities, 75 percent would frequently use pedestrian and 51 percent would frequently use bicycle facilities.

2.9. Imagine Sausalito Harbor And Downtown Action Committee, Final Report (April 2009)

The 2006 Community Visioning Efforts resulted in general recommendations for changes to the City and further effort known as *Imagine Sausalito* arose including a Harbor and Downtown Action Committee. The committee members deliberated on many issues at over thirty meetings. Results of these efforts are in this Report, memorializing recommendations for infrastructure improvements in the committee’s focus area, from Johnson Street to the 500 block of Bridgeway where commercial operations transition into residential uses. Recommendations were presented to the City Council in May of 2010.

The recommendation relevant to this planning effort include: realigning and extending a path from the Sausalito Yacht Harbor Boardwalk to the Ferry Landing; improving the tour bus waiting area for better vehicle flows and pedestrian safety; including more bicycle parking and potentially bicycle lockers and a pick-up point for rental bikes. Additionally, it calls for relocation of (approximately 60) parking spaces from parking lot 1 to parking lot 3 and constructing a bulkhead along the bay frontage of parking lot 3 to provide additional area for a path.

2.10. Imagine Sausalito Waterfront and Marinship Committee, Sausalito Waterfront and Marinship Vision (2010)

The Imagine Sausalito Waterfront and Marinship Committee (WAM) developed the Sausalito Waterfront and Marinship Vision Report. This report documents and assesses waterfront public benefits; physical and environmental challenges related to existing and anticipated natural and man-made conditions; and development influences, namely property ownership, government regulations and economic conditions. The WAM Report also analyzes alternatives for improved circulation through the Marinship area including a Shoreline Path and the North/South Greenway. The Shoreline Path is outside the scope of this Study but a proposed alignment in the Report for the North/South Greenway is similar to the path defined in this study. The WAM Report presents the existing path adjacent to Bridgeway south and north of the Marinship Area as the North/South Greenway.

Figure 2-5 shows, through the Marinship Area, the proposed path follows the toe of the slope east of Bridgeway starting at Liberty Ship Way and connecting back to Bridgeway immediately south of 2400 Bridgeway, the location of FedEx and other office tenants.

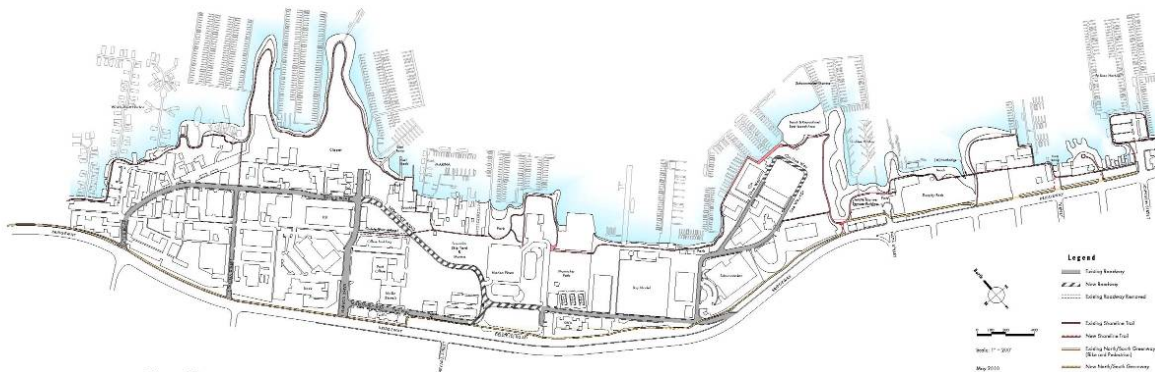


Figure 2-5 WAM Report Circulation Plan

2.11. Imagine Sausalito, Transportation Action Committee Final Report

The Transportation Action Committee (TRAC) Final Report, dated March 9, 2010, identifies several needs supporting development of a non-motorized north-south pathway through the City of Sausalito. This report also offers several goals guiding appropriate design standards for the for this path feasibility study. The TRAC Report reinforces findings from the City Resident Survey (discussed above); most relevant is a continuous pedestrian/bicycle pathway along the full length of Sausalito’s waterfront with 80 percent support of survey

respondents. With respect to preferred operational and design standards, the TRAC report emphasizes that separation of high speed regional through bicycle traffic from local bicycle traffic is important. In conclusion, while the TRAC report emphasizes the need for a local serving and continuous paved waterfront path, and the Sausalito City Council requires that this feasibility study focus on the Bridgeway corridor, there is substantial overlap in the desire for continuous paved multi-use pathways separate from existing roadways.

3. Bicyclist and Pedestrian Needs

This chapter provides an overview of the need for a continuous path from the Ferry Terminal to the Bridgeway/Gate 6 Road intersection including descriptions of path users, past bicycle and pedestrian collisions and counts in the Study Area, and a summary of future demand for the project.

3.1. Pedestrian and Bicycle User Groups

This section provides an overview of the user needs for the Ferry Terminal to Gate 6 Road Path. As discussed above, a separated pathway parallel to Bridgeway could serve a variety of commute and recreational bicyclists and local and tourist pedestrians.

The Ferry Terminal to Gate 6 Road Path would be accessible for a range of users, from strollers to bicycle tourists. The existing on-street Class II bike lanes and Class III bike routes serve as the high-speed bicycle corridor whereas the proposed path would serve pedestrians and slower moving bicyclists. This section of the document separates the range of users for the two different facilities and categorizes them into two Classes with an explanation of characteristics that each prefer in bicycle and pedestrian facilities.

3.1.1. Pedestrian Needs

Specific pedestrian circulation, safety and regulatory needs must be addressed in the design of the Ferry Landing to Gate 6 Road Path. The discussion below identifies the unique pedestrian needs among these three themes, differentiated from bicyclist needs.

Pedestrians using the proposed pathway need unimpeded and pleasant access to adjacent land uses, connecting walkways, intersection crossings, transit stops and all manner of adjacent attractors. Pedestrians are the most vulnerable user of the local transportation network and should be separated from other high speed travel modes to the fullest extent feasible. Local businesses are locations for shopping and commuting trips so pedestrians should have simple access to them from the path. Path users will also want to access transit stops in the Study Area, therefore access to bus stops and the Ferry Terminal should be safe and direct. People parking vehicles become pedestrians when they leave their car. Therefore, the path should provide access between parking and the path.

Providing for pedestrian safety in a multi-modal context including auto, bus and bicycle traffic requires clear delineation of pedestrian only areas and clear delineation of areas where all transportation modes should exercise caution and reduce speeds. Pedestrians are deterred from paths when they are adjacent to traffic and speeding bicyclists. Therefore the design of the Path should buffer pedestrians from traffic and attempt to slow bicyclists so not to speed on the path. The pathway design should delineate pedestrian and bicycle separation where feasible.

Regulatory design requirements for the pedestrian walkways are described in the Americans with Disabilities Act (ADA) guidelines and associated documents. Design guidelines and specifications for walkways include but are not limited to clear path, longitudinal and cross slopes, obstacles and gaps, curb ramp configurations,

street crossings, crossing times, accessible pedestrian signals and detectable wayfinding. This study includes neither a detailed ADA compliance inventory nor audit for the Study Area but does emphasize ADA compliance in the recommended improvements presented in Chapter 6. As this project moves into detailed design development, environmental review, final design and construction ADA compliance is a required element of the project. ADA guidelines change rapidly and it will be the job of the project designer and City staff to ensure current ADA compliance at the time of construction.

3.1.2. Bicycle Commuter and Utility Trip Needs

Commuters and utility trip trail users consist of employed adults and students of all ages. These trips are between work and home as well as to other locations with specific purposes, such as a store or a park. Typically these types of trips account for about one-third of all weekday person trips. This represents a substantial opportunity for bicycle and pedestrian usage because of the link to commercial, residential, neighboring cities, and transportation in Sausalito. Common commute characteristics include:

- Commuter trips usually range from several blocks to ten miles.
- Commuters typically seek the most direct and fastest route available.
- Commute periods typically coincide with peak traffic volumes and congestion, increasing the exposure to potential conflicts with motor vehicles.
- Major commuter concerns include changes in weather (rain and heavy fog), riding in darkness, personal safety and security.
- In general, a primary concern to all bicycle commuters are intersections with no control signs (i.e., stop or yield signs) or signal controls.
- Commuters generally prefer routes where they are required to stop as few times as possible, thereby minimizing delay.

Marin County commuters who currently drive to Sausalito and San Francisco for work face parking shortages and likely face traffic delays. Greater use of the bikeways in Sausalito may encourage some commuters who currently drive to walk or bicycle to San Francisco or the San Francisco Ferry, thereby offering commuters saved resources and less traffic congestion.

3.1.3. Recreational Bicyclist Needs

Recreational use generally falls into one of three categories: exercise, travel to non-work destinations (such as shopping or libraries), and sightseeing. Recreational bicyclists can be a varied user group in and of themselves, since the term encompasses a broad range of skill and fitness levels, from a racer who rides 100-miles each weekend, to a family with young children who are bicycling while on vacation. Regardless of the skill level of recreational users, directness of route is typically less important than being in scenic surroundings, having amenities like restrooms and water fountains, and being on routes with few traffic conflicts. Visual interest, shade, protection from wind, moderate gradients, and artistic or informational features also has a much higher value to recreational users. Also, a smooth surface is important.

All recreational corridor users require some basic amenities to have a comfortable experience. They include dedicated facilities (such as sidewalks or bike lanes), clear destination and intersection signage, and even

surfaces. The aesthetic component of a facility is very important to most recreational users. In other words, most people prefer to walk or bicycle in pleasing surroundings. For families and children, most often these are facilities separate from vehicle traffic. All of these recreational bicyclists provide a commercial resource to local businesses. They stop for food and drinks and other shopping needs.

The Sausalito Ferry Terminal to Gate 6 Road corridor has different levels of recreational needs. First is the need to provide a dedicated continuous and direct facility that connects north to south for recreational sport bicyclists. The needs for these users are much like commuters. They prefer on-street, direct, and with traffic. This facility is provided in Sausalito with the existing bike lanes and bike routes on Bridgeway. The other need is providing a facility for slower moving bicyclists and pedestrians, such as tourists or families with children. The proposed Ferry Terminal to Gate 6 Road Path will meet this need being that it will be primarily off-street with amenities and places to stop on along the route.

3.2. Bicycle and Pedestrian Counts

Bicycle and pedestrian counts were performed at Bridgeway and Princess Street in Sausalito in 1999, 2007, 2008, and 2009. The County of Marin performed the 1999 counts for the County Bicycle Plan. The more recent counts from 2007-2009 were performed by the Transportation Authority of Marin and the County for the Non-motorized Transportation Pilot Program (NTPP) and the National Bicycle & Pedestrian Documentation Project (NBPDP).² The NTPP funded this Study and a description of it is in Chapter 1. The NBPDP project aims to establish a consistent national bicycle and pedestrian count and survey methodology, to generate a national database of bicycle and pedestrian count information. This information will assist analysis on correlations between various factors and bicycle and pedestrian activity, ranging from land use to demographics to facility-type. Section 3.5's demand analysis uses NBPDP data.

Figure 3-1 shows the count results from these data collection efforts at Bridgeway and Princess Street, located immediately south of the Study Area. Weekday counts occurred from 4:00 PM to 6:00 PM and weekend counts occurred from 12:00 PM to 2:00 PM. According to these counts, since 1999, weekday bicycle and pedestrian activity increased until 2008 and then there was a slight decrease in 2009. The weekend counts show that there was a small decrease in walking and biking between 1999 and 2007 and then an increase in 2008 and 2009.

² <http://bikepeddocumentation.org/>

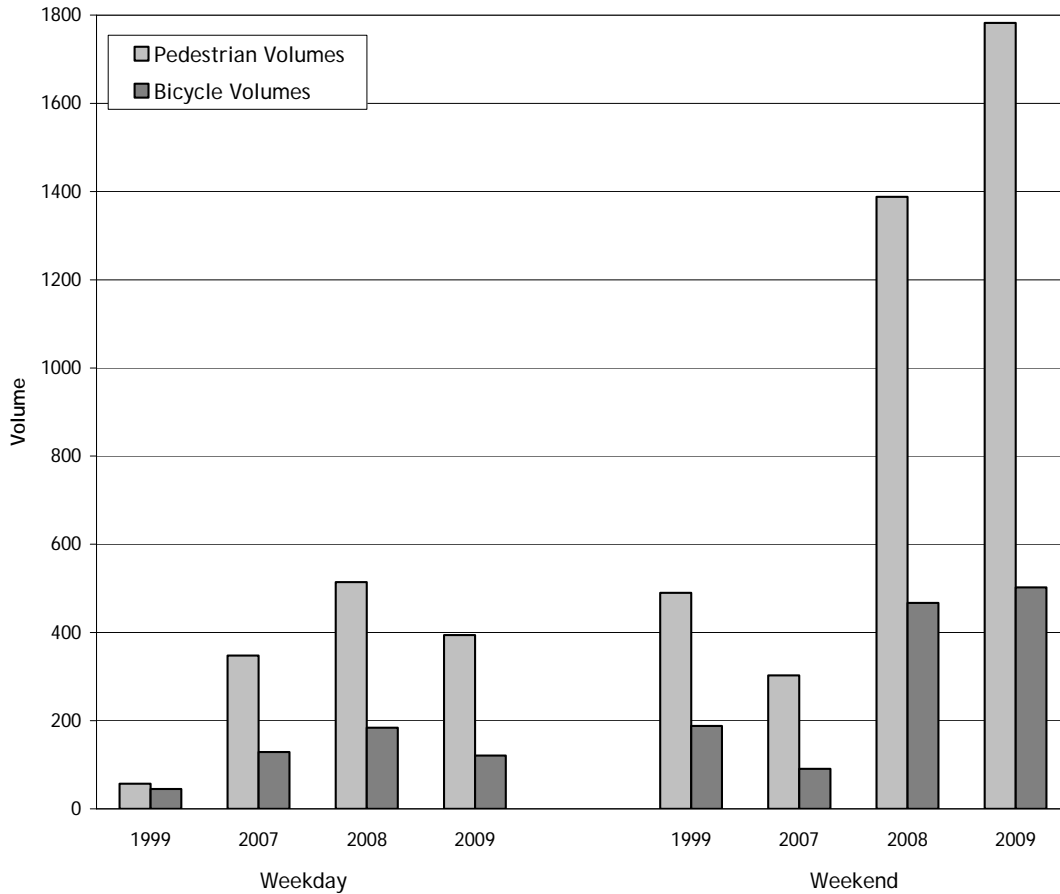


Figure 3-1 Sausalito Bicycle and Pedestrian Counts at Bridgeway and Princess Street, 1999-2009

In addition to the counts at Bridgeway and Princess Street, bicycle and pedestrian counts were collected for this Study in November 2009 on Bridgeway at Dunphy Park. Counts occurred from 4:00 PM to 6:00 PM and the results are in Table 3-1. The data is split into northbound and southbound travel and whether bicyclists were riding on the street or on the sidewalk/sidepath

The results show that the sidewalks and the on-street bicycle lanes are heavily used. During this count period, the majority of bicyclists used the on-street bicycle lanes. Additionally, this data shows that there are many pedestrians in the corridor. A further analysis of this data is in Section 3.5, the demand model that forecasts future path users.

Table 3-1 2009 Bicycle and Pedestrian Counts

Start	Stop	Northbound			Southbound		
		Pedestrians on Sidewalk	Bicyclists on Sidewalk/Sidepath	Bicyclists in Bike Lane	Pedestrians on Sidewalk	Bicyclists on Sidewalk/Sidepath	Bicyclists in Bike Lane
4:00	4:15	7	4	7	6	4	10
4:15	4:30	1	0	3	5	3	9
4:30	4:45	8	0	12	7	3	11
4:45	5:00	6	1	9	4	2	5
5:00	5:15	4	4	13	3	2	3
5:15	5:30	10	2	6	3	0	10
5:30	5:45	4	0	12	2	1	0
5:45	6:00	4	0	9	8	0	2
Total		44	11	71	38	15	50

3.3. Historical Collision Information

Bicycle and pedestrian collision data from the Statewide Integrated Traffic Records System (SWITRS) and from the City of Sausalito illustrates the collision history for the Study Area. As Table 3-2 shows there were 116 collisions involving bicyclists and pedestrians from 2002 to 2008 and one of the pedestrian collisions resulted in a fatality. As Figure 3-2 shows these bicycle collisions occurred on Bridgeway or within one block of Bridgeway.³ Figure 3-2 shows the pedestrian collisions, all of these were on Bridgeway except for one.

There are high volumes of bicycles and pedestrians on Bridgeway. This Study addresses specific locations with improvements where there are historically high numbers of bicycle and pedestrian collisions. The intersections with the highest collision totals are:

1. Bridgeway and Princess Street (9 collisions)
2. Bridgeway and Ebbtide Avenue/Gate 5 Road (8 collisions)
3. Bridgeway and Caledonia Street (7 collisions)

Table 3-2 Bicycle and Pedestrian Related Collisions in the Study Area, 2002-2008

	Collisions	Fatalities
Bicycle	97	0
Pedestrian	19	1
Total	116	1

³ Figure 3-2 shows the collisions with cross streets included in the SWITRS data set. Approximately 45 of the collisions are not mapped because the data set does not include a cross-street.

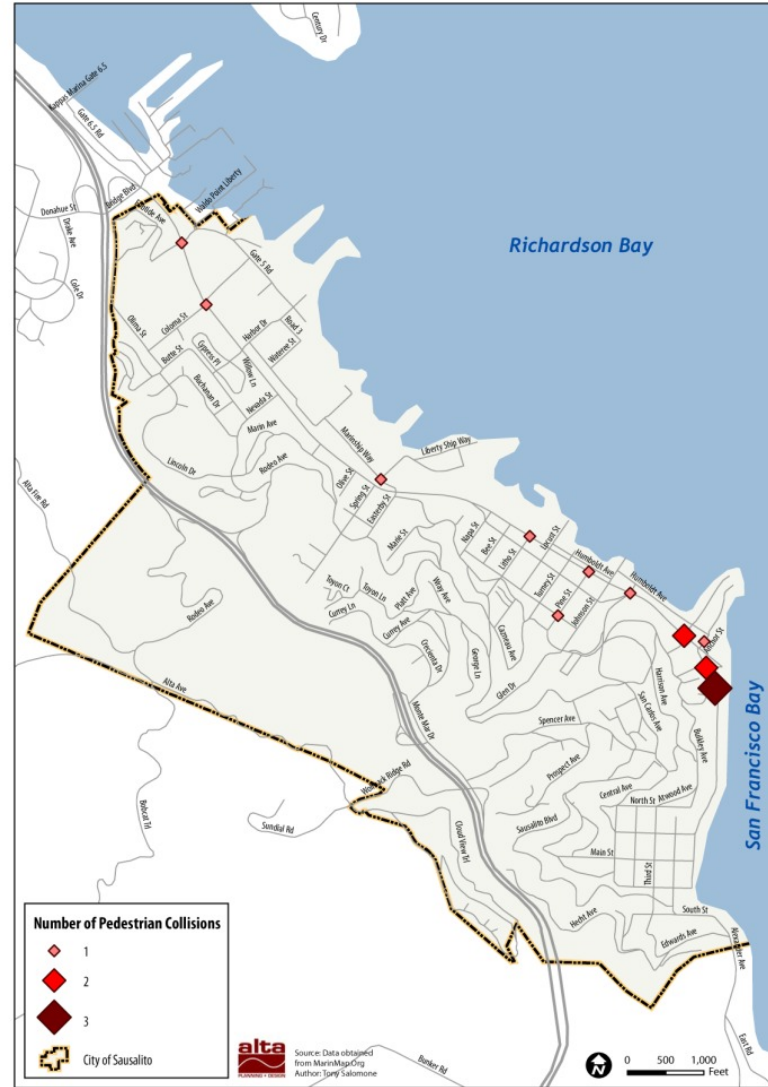
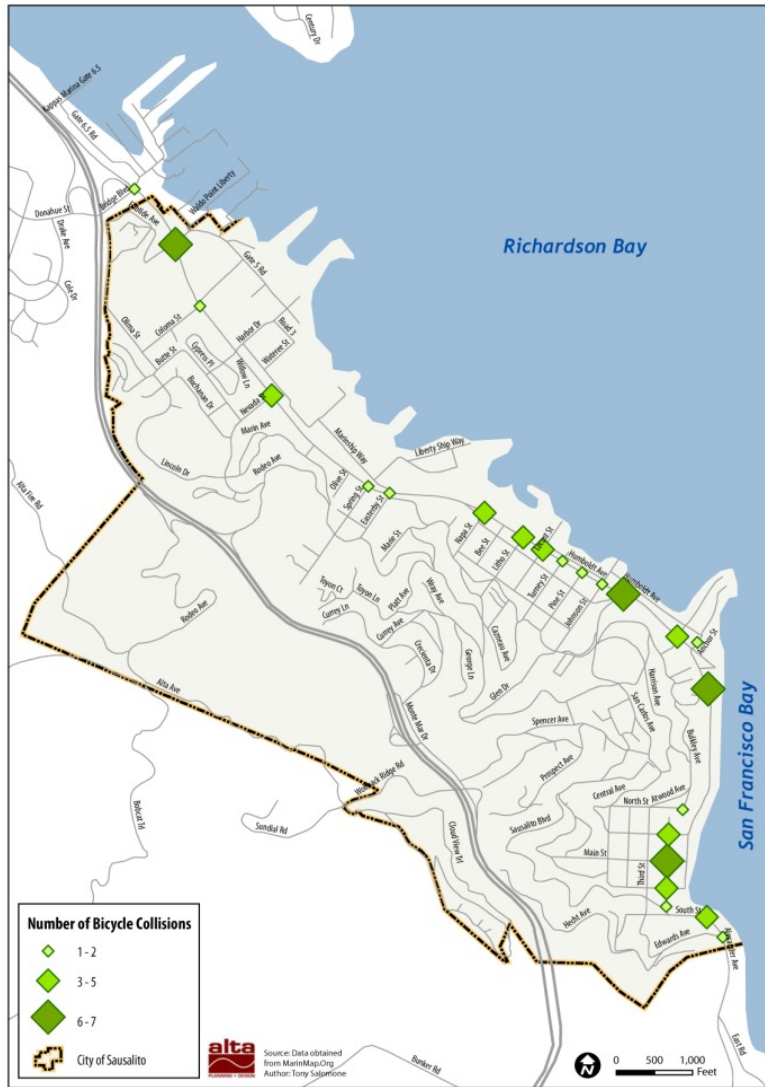


Figure 3-2 Study Area Bicycle and Pedestrian Collisions, 2002-2008

3.4. Engineering and Traffic Study

In accordance with California Vehicle Code, the City conducted its five-year traffic and speed study March through May 2009. The purpose of this study was to evaluate the posted speed limits on Bridgeway, Harbor Drive and Gate 5 Road. The determination of speed limit appropriateness is based on the 85th percentile speed. Under normal circumstances speed limits are set at the speed that 85 percent of vehicles are traveling. The results of the survey are mixed, with reductions and increases in proposed speed limits. Northbound Bridgeway is proposed to increase to 35 miles per hour (mph) where it is currently 30 mph. This information assists in determining proposed crossing treatments for the project pathway.

3.5. Demand Analysis

One of the goals for the Ferry Landing to Gate 6 Road Path Study is to provide a path for bicycle and pedestrian tourists and Sausalito residents and employees. The number of users attracted to the corridor will increase with the proposed improvements. This analysis provides an estimate of existing bicycle and pedestrian use in the corridor and an estimated demand for the Study Area including the development of a completed path.

3.5.1. Existing Use

This demand forecast is based in part on counts from the 2009 Non-Motorized Transportation Pilot Program (NTPP). The counts are from the peak usage hours collected in September 2009 and tabulated in accordance with the National Bicycle and Pedestrian Documentation Project (NBPD).⁴ The NTPP count data geographically nearest the Study Area is from Mill Valley-Sausalito Path at the Tennessee Valley Path intersection in Tam Valley. **Figure 3-3** shows an aerial view of the count location and the screen line for the counts. This location is north of the Project Study Area, however there are no major destinations or turn off points for path users between this location and the northern boundary of the Study Area at Gate 6 Road. The results of the existing and future demand estimates are conservative given that the southern end of the Study Area at the Ferry Terminal has higher demand due to the number of tourists in downtown Sausalito and waiting for ferry departures.

⁴ The NBPD is a nationwide effort by Alta Planning + Design and the Institute of Transportation Engineers (ITE) providing a consistent model for data collection and ongoing data for use by planners, governments, and bicycle and pedestrian professionals. <http://bikepeddocumentation.org/>



..... Screenline

Figure 3-3 Bicycle and Pedestrian Count Location

Table 3-3 shows the peak hour bicycle and pedestrian counts for the corridor. Both recreational and commuting bicyclists and pedestrians use the path. However, based on the higher weekend bicycle counts, the path has more recreational bicycle use. On the weekday, 74 percent of users were bicyclists and on the weekend, 88 percent of users were bicyclists.

Table 3-3 Peak Hour Bicycle and Pedestrian Counts

	Peak Hour	Bicyclists	Pedestrians	Total
Weekday	4:00-5:00 PM	116	40	156
Weekend	12:00-1:00 PM	397	55	452

Table 3-4 shows, daily, monthly, and annual estimated bicyclists for the Study Area. These estimates are derived from the peak hour counts and adjustment factors from the NBPD. The NBPD has established factors for determining daily count estimates from peak hour counts. These factors are based on 365-day 24-hour automated counts and manual counts on bike paths nationwide. Based on NBPD data, peak counts account for 7 percent of daily users on weekdays and 9 percent of daily users on weekends. For monthly estimates, the number of daily weekday users is then multiplied by 20 for approximate number of weekdays in a month and the number of daily weekend users is multiplied by 8 for the approximate weekend days in a month. These estimates are then added for a monthly estimate (84,860). To estimate the number of annual users, the NBPD

uses monthly factors. It is assumed that the monthly estimates accounts for 8 percent of annual users. Based on this methodology and combining weekdays and weekends, Table 3-4 shows an existing estimated 1,060,750 annual bicyclists and pedestrians in the Study Area.

Table 3-4 Existing Study Area Bicyclists and Pedestrians

	Bicyclists	Pedestrians	Bicyclists & Pedestrians	Adjustment for 24 hours ¹	Hourly Adjust Factors	Daily Estimate ²	Monthly Estimate ³	Monthly Estimate	Annual Estimate ⁴
Weekday	116	40	156	164	0.07	2,343	46,860	84,860	1,060,750
Weekend	397	55	452	475	0.10	4,750	38,000		

¹ Peak hour has a 5 percent adjustment to derive the daily estimate. This is because daily estimates are based on 6 AM to 10 PM factors and an additional 5 percent walk and bike during other times.

² Daily Estimates are based on factors for bicycle and pedestrian facilities derived in the National Bicycle & Pedestrian Documentation Program

³ Monthly total based on 20 weekdays and 8 weekend days in a month

⁴ Annual estimates are based on factors for bicycle and pedestrian facilities derived in the National Bicycle Pedestrian Documentation Program

Based on the existing counts, *NTPP Summary of 2007 and 2008 Bicycle and Pedestrian Counts and Surveys*⁵, and NBPDP research, Table 3-5 shows that an estimated 84 percent of annual Study Area corridor users are bicyclists and 16 percent of annual path users are pedestrians. NTPP surveys of bicyclists and pedestrians in Marin County also found that 37 percent of bicyclists and 44 percent of pedestrians use this type of facility in Marin for transportation (rather than recreation).

Table 3-5 Existing Transportation and Recreation Trip Split

	Annual Estimate	Transportation	Recreation
Bicyclists	891,030	329,681	561,349
Pedestrians	169,720	74,677	95,043
Total	1,060,750	404,358	656,392

3.5.2. Future Demand

The number of users in the project Study Area is expected to increase to 1,380,000 with development of the Ferry Terminal to Gate 6 Road Path. New users will include local Sausalito and Marin County residents connecting between cities and to the Ferry Terminal and increased numbers of tourists connecting north on

⁵ February 2008. Available here: http://www.walkbikemarin.org/documents/NTPP_Count_Survey_Report_Update_2.09r.pdf

the Sausalito Path and to the Mill-Valley Sausalito Path. In total, a 30 percent increase over current 2010 annual volumes is expected. As referenced above, this demand estimate is based on existing bicycle and pedestrian users in the project vicinity and comparable counts on paths nationwide; calibrated for local environment, trail length, surrounding land use, population, density, climate, number of visitors, and aesthetics.

This high number of estimated users warrants bicycle and pedestrian facilities that can accommodate the high level of use. Fortunately for Sausalito, the existing Class II bike lanes provide a facility for some bicyclists and the improved Bridgeway path will provide for the remaining bicyclists. The sidewalks on both sides of Bridgeway also help disperse the high volume of pedestrians to the two facilities on different sides of the street. During peak hours on weekends, the bicycle path may have high levels of use but will still be operational at an acceptable level.

Using existing available data and available modeling techniques it is not possible to accurately forecast the split of bicyclists between the proposed pathway and the existing Class II on-street bicycle lanes nor is it feasible to estimate how many pedestrians will use the proposed pathway versus existing sidewalks in the Study Area. It is clear that these users will self distribute among the proposed pathway, the existing Bridgeway sidewalk, and the Bridgeway Class II bicycle lanes. Under the existing condition, a significant number of long-distance and high speed commuter and recreational bicyclists use the Bridgeway Class II on-street bicycle lanes through Sausalito and would continue to do so even with development of the recommended pathway. It is also important to point out that the existing discontinuous bicycle path parallel to Bridgeway does not attract many bicyclists due to root upheaval, circuitous routing, and other obstacles. Based on local and national use and trends, the majority of high-speed bicyclists will continue to ride on the street, regardless of trip origin and destination. In addition, recent transportation research has clearly established that less experienced and more vulnerable bicyclists are attracted to separated, protected bicycling environments.⁶ The final design inclusive of wayfinding, intersection treatments, as well as paving surface and site amenities will significantly influence what types of riders choose which facility.

⁶ "Cycling for Everyone: Lessons from Europe," *Transportation Research Record: Journal of the Transportation Research Board*, No. 2074, November 2008, pp. 58-65 (with Ralph Buehler).

4. Opportunities & Constraints Analysis

This chapter of the Study describes the existing conditions and opportunities and constraints for a pathway in the Study Area. As **Figure 4-1** shows, the project area is divided into six segments. These segments are:

- Segment 1 – Ferry Terminal to Johnson Street
- Segment 2 – Johnson Street to Locust Street
- Segment 3 – Locust Street to Napa Street
- Segment 4 – Napa Street to Liberty Ship Way
- Segment 5 – Liberty Ship Way to Harbor Drive
- Segment 6 – Harbor Drive to Gate 6 Road

The following pages and figures show the opportunities and constraints for each segment in more detail. Additionally, the maps show the parcel boundaries in the Study Area.

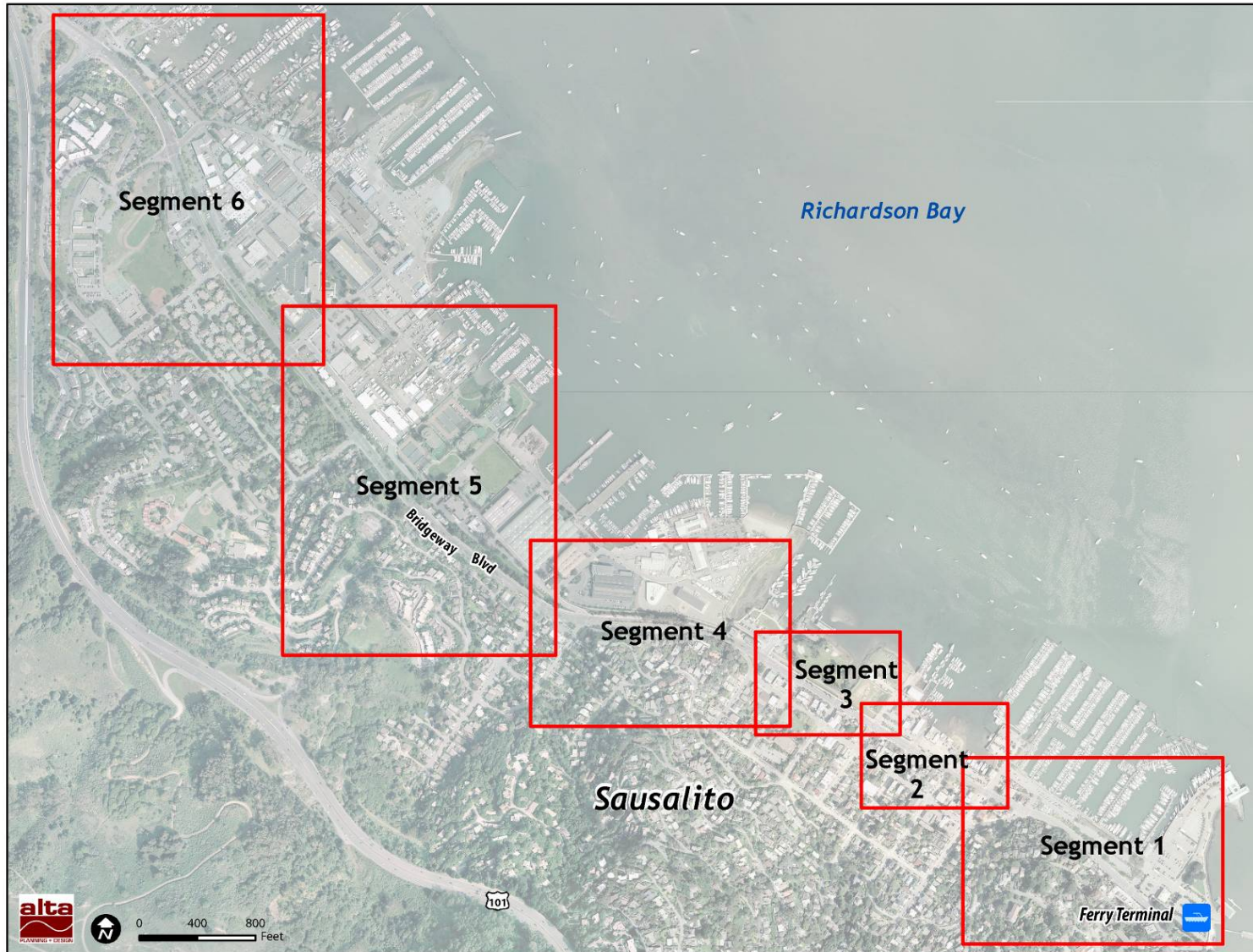
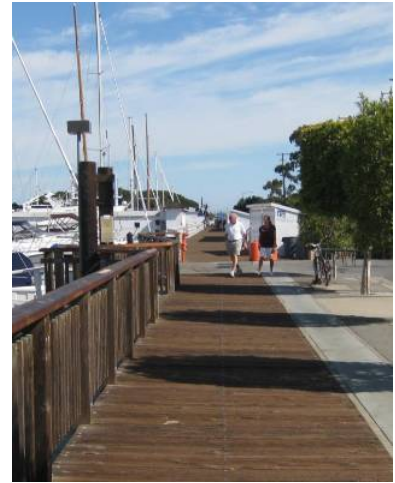


Figure 4-1 Study Area Segments

4.1. Segment 1 – Ferry Terminal to Johnson Street

Segment 1 begins at the Ferry Terminal, proceeds northward to parking lot 1, crosses Anchor Street, parallels Humbolt Avenue, across Bay Street, cuts through Parking lots 3 and 4, to the intersection with Johnson Street and then along Johnson Street to the Bridgeway right-of-way. The City owns the parking lots and controls the street rights-of-way. The parking lots are often parked to capacity and they are highly valued by the City, local residents, and businesses. At the northern limit of Segment 1, Johnson Street has existing sidewalks on both sides and there is a signalized crosswalk on the east leg of the Bridgeway/Johnson Street intersection. Popular destinations on this segment are the Ferry Terminal, downtown Sausalito shops and restaurants, Gabrielson Park and Vina Del Mar Park, which is located just west of parking lot 1 and is a popular pedestrian site. Gabrielson Park is located between Spinnaker Drive (an extension of Anchor Street) and the Ferry Terminal. Tourists often wait at Gabrielson Park before boarding the San Francisco bound ferry.



The Shoreline Path adjacent to Parking Lot 4 serves pedestrians

4.1.1. Opportunities

Several opportunities for a separated pathway exist along Segment 1 that will greatly enhance nonmotorized access through this segment of the corridor. Bridgeway has existing Class II bike lanes in both directions and a shoreline boardwalk path borders Richardson’s Bay and the private marina, Sausalito Yacht Harbor. Many pedestrians use the boardwalk path and also use the sidewalks along Bridgeway. In the parking lots, the City plans to remove the vehicle entrance/exit gates and install a pay per space fare collection system. This is expected to improve the utilization rate of the available spaces and may provide an opportunity to consider alternative parking layouts, which could open up some space in the lots for additional parking. Additionally, the City uses conservative parking stall widths and lengths and aisle widths in the parking lots. There are opportunities to modify the parking lot layouts with the addition of new parking collection technology, removal of the entrance/exit gates, and modifying the standard parking stall and aisle dimensions.

4.1.2. Constraints

Parking lots 1, 3, and 4 present a major constraint in the project area. Though parking layout modifications are possible, this is a costly change. Additionally, the City has an existing ordinance (Number 1128) establishing that parking lots 1, 2, 3, and 4 “shall not be used for purposes other than public parking lot uses without voter approval” and according to the Sausalito General Plan, the amount of public land area provided in Downtown for public parking cannot be increased by any amount or decreased by five percent without Sausalito voter approval. Therefore, the best solution for the Ferry Terminal to Gate 6 Road path is to not impact the number of existing parking spaces by more than five percent.

On the south end of the Study Area, there is a walkway through Gabrielson Park connecting the Ferry Terminal sidewalk to the sidewalk adjacent to Humboldt Avenue between Anchor and Bay Streets. This walkway is not a direct line of travel to the sidewalk adjacent to parking lot 2 and could be improved for bicyclists and pedestrians. Gabrielson Park is called out in the same approved ordinance described above for the parking lots in Sausalito; the ordinance states that Gabrielson Park shall not be changed from its current conditions without voter approval.

Continuing north through the corridor, parking lot 3 abuts Richardson’s Bay, which is an earthen bank that has been hardened and reinforced with rip-rap to minimize erosion. The top of bank is currently landscaped with low maintenance grass and ground cover. Due to physical constraints, there is limited existing space to develop a path between the parking lot pavement in the vicinity of the top of bank. There is no funded plan to install a bulkhead or fill this area between the existing boardwalk and the parking lot.

4.2. Segment 2 – Johnson Street to Locust Street

Segment 2 is within the Bridgeway right-of-way from Johnson Street to Locust Street. The route crosses Pine and Turney Streets. Locust Street from Bridgeway to the Humbolt right-of-way is operated as parking lot 5. The east side of Bridgeway has a sidewalk and a deteriorating parallel side path that crosses driveways, Pine



The Bridgeway sidepath at the Pine Street intersection



The Bridgeway sidepath has stencils delineating space for bicyclists

Street and Turney Street. These are side-street stop-controlled unsignalized crossings, striped with parallel line crosswalks. Popular destinations along this segment are the businesses along Bridgeway and the residential areas west of Bridgeway. There is a public boat launch at the east end of Turney Street. On the west side of Bridgeway there is an existing sidewalk approximately 10 feet wide and a Class II bicycle lane.

4.2.1. Opportunities

Segment 2 opportunities include the existing sidewalk and parallel side path on the east side of Bridgeway. With some variation, the width of this section within public right-of-way is approximately 18 feet. The side path currently serves as a bike path adjacent to the sidewalk. Bicyclists and pedestrians use both the sidewalk and the parallel path to travel in north and southbound directions. There is an opportunity to close a “gap” in the existing Class II bike lane by creating a new facility in this segment. There is also an opportunity to address the demand for street crossing by modifying the traffic signal at Johnson to include protected turning movements, bicycle detection for southbound traveling bicyclists and pedestrians who desire/need to cross Bridgeway and enter (bicyclists only) the southbound Class II path south of Johnson Street.

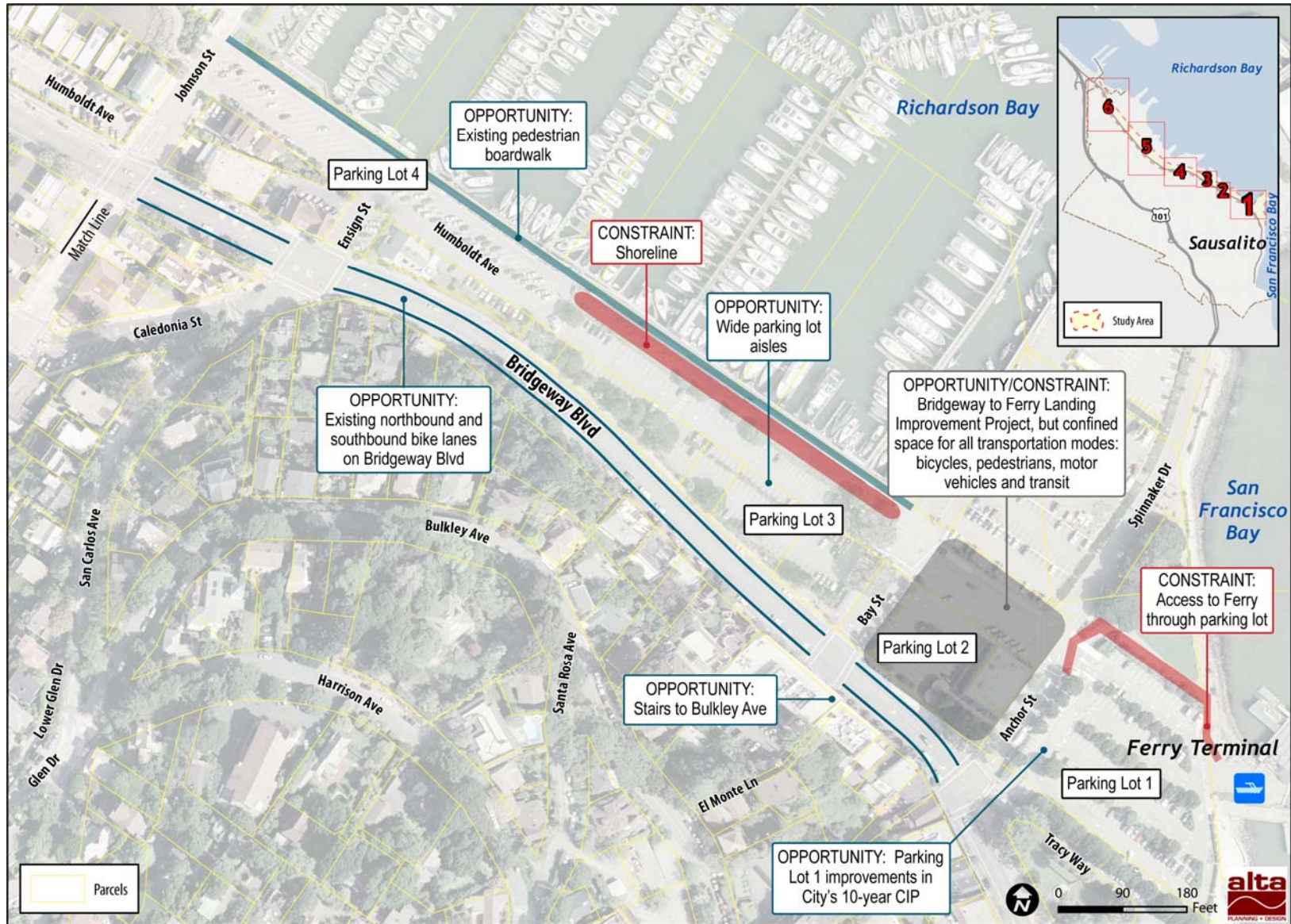


Figure 4-2 Opportunities and Constraints: Segment 1 Ferry Terminal to Johnson Street

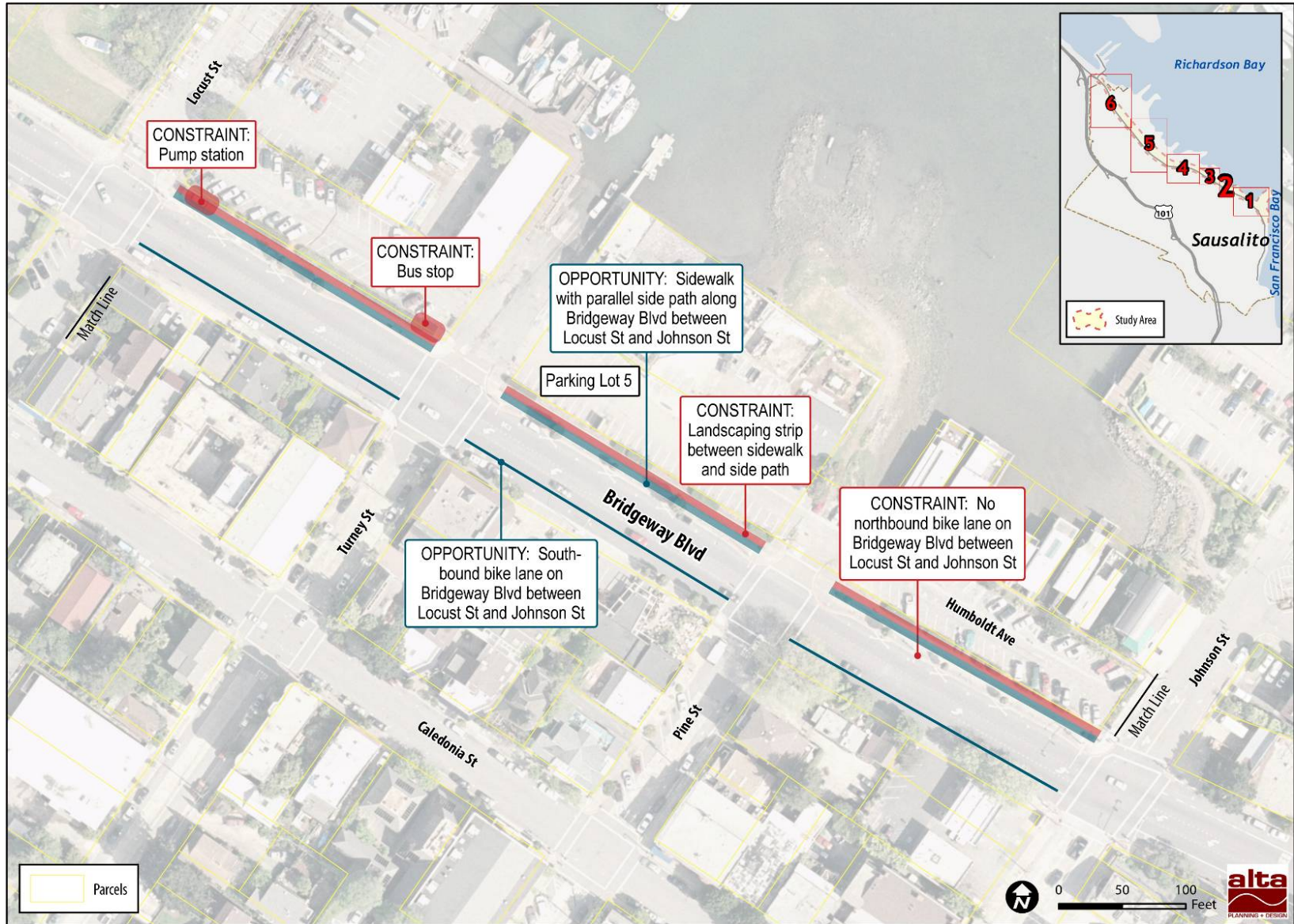


Figure 4-3 Opportunities and Constraints: Segment 2 Johnson Street to Locust Street

4.2.2. Constraints

There is an existing landscaped area separating the sidewalk and side path on the east side of Bridgeway between Johnson and Turney Streets. This is a buffer between the existing bicycle path and sidewalk. However these paths of travel are narrow and constrain the through-zones. Along these paths of travel, pedestrians and bicyclists use both facilities. Other constraints along Segment 2 are the bus stop on the northeast corner of the Bridgeway/Turney Street intersection and the pump station at the southeast corner of the Bridgeway/Locust Street intersection. These constraints cause the sidewalk/side path to narrow. Along Segment 2, the east side of Bridgeway does not have existing on-street bicycle facilities due to constrained right-of-way within the curb lines. These constraints include on-street parking and corner curb “bulbs” that interfere with lane reconfiguration. The east side of Bridgeway is also constrained by street lighting and traffic signal standard position that may interfere with potential path position and/or increase project cost due to utility relocation costs. The sidewalk along southbound Bridgeway abuts several privately owned commercial structures that do not meet current accessibility standards. These standards may be may be achieved by changing sidewalk grade and/or redesigning interior floors of the building.

4.3. Segment 3 – Locust Street to Napa Street

Segment 3 is along the Bridgeway right-of-way from Locust Street past Dunphy Park to Napa Street. This segment connects adjacent to a privately-owned and currently vacant parcel on the south end then continues north past an adjacent City-owned parcel, which is also currently vacant. Segment 3 continues further north past the City of Sausalito’s Dunphy Park. The sidewalk and parallel side path on the east side of Bridgeway intersect with Locust Street, a side-street stop, with a parallel lined crosswalk. Destinations along this segment are the park, where there is an existing gravel parking lot immediately to the east of Bridgeway, the Sausalito Cruising Club, Cass’ Marina, Galilee Harbor Marina. Connections along this segment include Bee Street and Litho Street where City Hall and the Sausalito Library are located. Bridgeway has a Class II bicycle lane on the west side serving southbound bicyclists. There is a sidewalk along the west side of Bridgeway that is approximately 10 feet wide.

4.3.1. Opportunities

The two parcels at the south end of Segment 3, on the east of Bridgeway, offer path development opportunities. Construction of path facilities, dedication of right-of-way for pathway or a combination of the two may be imposed as Development Conditions of approval. Additionally, along this segment there is a combined wide sidewalk/side path that continues from Segment 2. Between Napa Street and Litho Street, there are existing Class II bike lanes on both sides of Bridgeway.

4.3.2. Constraints

Due to constrained right-of-way on Bridgeway between Locust and Litho Streets, there is an existing bicycle lane on the east side but not on the west side. Another constraint for this area is Dunphy Park that presently does not have a master plan to guide path recommendations in this area. The Park is an especially popular destination during summertime events.

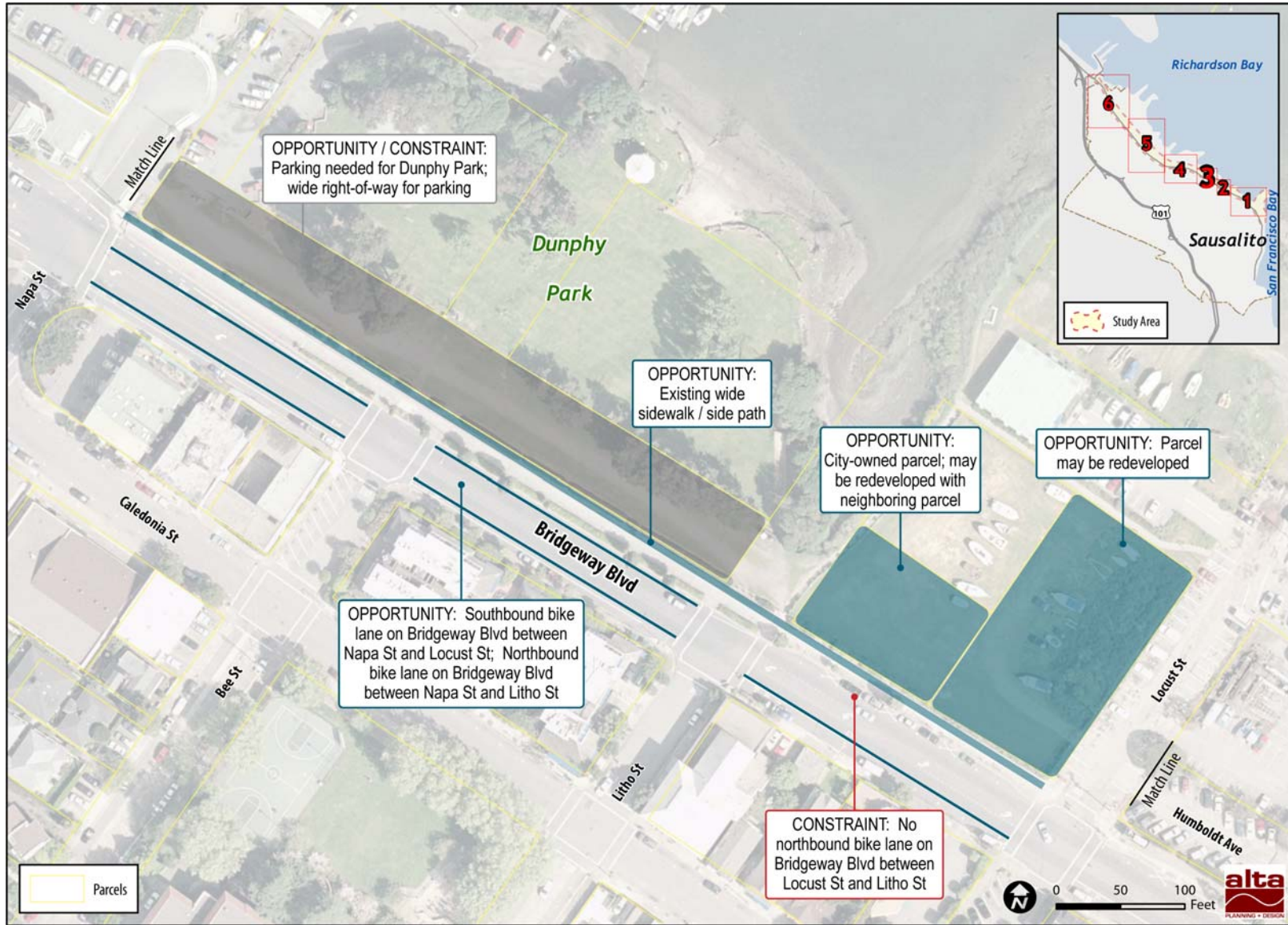


Figure 4-4 Opportunities and Constraints: Segment 3 Locust Street to Napa Street

4.4. Segment 4 – Napa Street to Liberty Ship Way

Segment 4 of the alignment connects Napa Street and Marinship Way. In this segment, there is an opportunity to consider a route along Bridgeway and also an opportunity to consider a route outside of the Bridgeway right-of-way, along the historic railroad right-of-way route. There is an existing Class I path along this former railroad route. Within this section, the existing path is located within public easements that traverse through privately owned parcels. Most of the existing path follows the railroad route and stays level with the shore’s elevation. There is one unpaved section of the existing path at Mono Street, an unimproved City street that is 60 feet wide. Though unimproved, this section of the path is currently composed of compacted gravel.



Existing path parallel to Bridgeway and connecting from Marinship Way

In Segment 4, Bridgeway slopes up and separates from the railroad route. Along this segment, Bridgeway is a divided four lane arterial road with a Class II bike lane on the street for northbound cyclists. Bridgeway has a Class III bicycle route for southbound bicycle traffic. There are four to five foot wide sidewalks along Bridgeway in various conditions.

The Bridgeway/Napa Street intersection is side-street stop controlled with a parallel line striped crosswalk. There are sidewalks on both sides of Napa Street. On the north end of the existing path is the Marinship Way/Liberty Ship Way intersection. There is no traffic control on the southern leg of the intersection where traffic travels downhill from Bridgeway. This intersection is private property though the “ramp” portion of Marinship Way is within a public easement and the street improvements are maintained by the City of Sausalito. The other two legs are stop-controlled. There is a parallel line striped crosswalk across Liberty Ship Way. The path connects to the neighboring office buildings and the shore path. The existing path intersects Libertyship Way but is slightly offset east of the Marinship Way/Libertyship Way intersection. The privately-owned Libertyship Way follows the same alignment as Spring Street. A significant elevation difference exists, precluding a direct connection between Libertyship Way with Spring Street.

4.4.1. Opportunities

The primary opportunity for the Ferry Terminal to Gate 6 Road Path in Segment 4 is connecting to the existing path. This path varies from approximately eight to eleven feet wide, providing ample room for bicyclists and pedestrians. Additionally, there is a need to install a Class II bike lane on Bridgeway between Napa and Easterby/Marinship Way to close a gap in the southbound Bridgeway bike lane. Sidewalks along Bridgeway are adequate for single file use. However the sidewalk grade is has been altered by ground movement. Additional width, to approximately eight feet would allow for side-by-side pedestrian use along Bridgeway.

Other opportunities include modifying traffic signal to enable protected left turns and installing bicycle and ADA accessible pedestrian detection on the side street intersections with Bridgeway.

4.4.2. Constraints

Bridgeway presents the largest constraints along Segment 4. The existing sidewalks on Bridgeway are four to five feet wide and do not allow for pedestrians to walk side by side. Also, there is a steep hillside on the east side of Bridgeway between the existing sidewalk and path that prevents future road or sidewalk widening without major construction. Also due to the constrained right-of-way due to the hills and on-street motor vehicle parking, there are no bike lanes on the west side of Bridgeway between Napa Street and Marinship Way. A 2004 improvement project found high demand for on-street parking along this segment from residents that do not have off-street parking and marine “liveaboards” in the vicinity.

4.5. Segment 5 – Liberty Ship Way to Harbor Drive



Open Space below Bridgeway near the Bay Model



Marinship Way between the parking lot and the boat storage parcels

Segment 5 connects Liberty Ship Way north to Harbor Drive. Like Segment 4, there is an opportunity to consider a path route along Bridgeway and/or along the historic and former railroad right-of-way. This portion of the Study Area travels down the slope along Bridgeway and along the mostly privately-owned Marinship Way. The southernmost section of this segment is within private owned property, from the Marinship Way/Liberty Ship intersection north to Testa Street. Marinship Park is on the southeast corner of the Marinship Way/Testa Street Intersection. Marinship Way doglegs at Testa Street and is privately owned until Wateree Street which is visually the southern boundary of the Mollie Stone’s Grocery Store (100 Harbor Drive) and the Fed Ex Office (2400 Bridgeway). Along this segment there are buildings and several boat storage sites. The Bay Model and Mollie Stone’s Grocery Store are the major destinations along this segment. Marinship Way appears to follow the former railroad route in this segment.

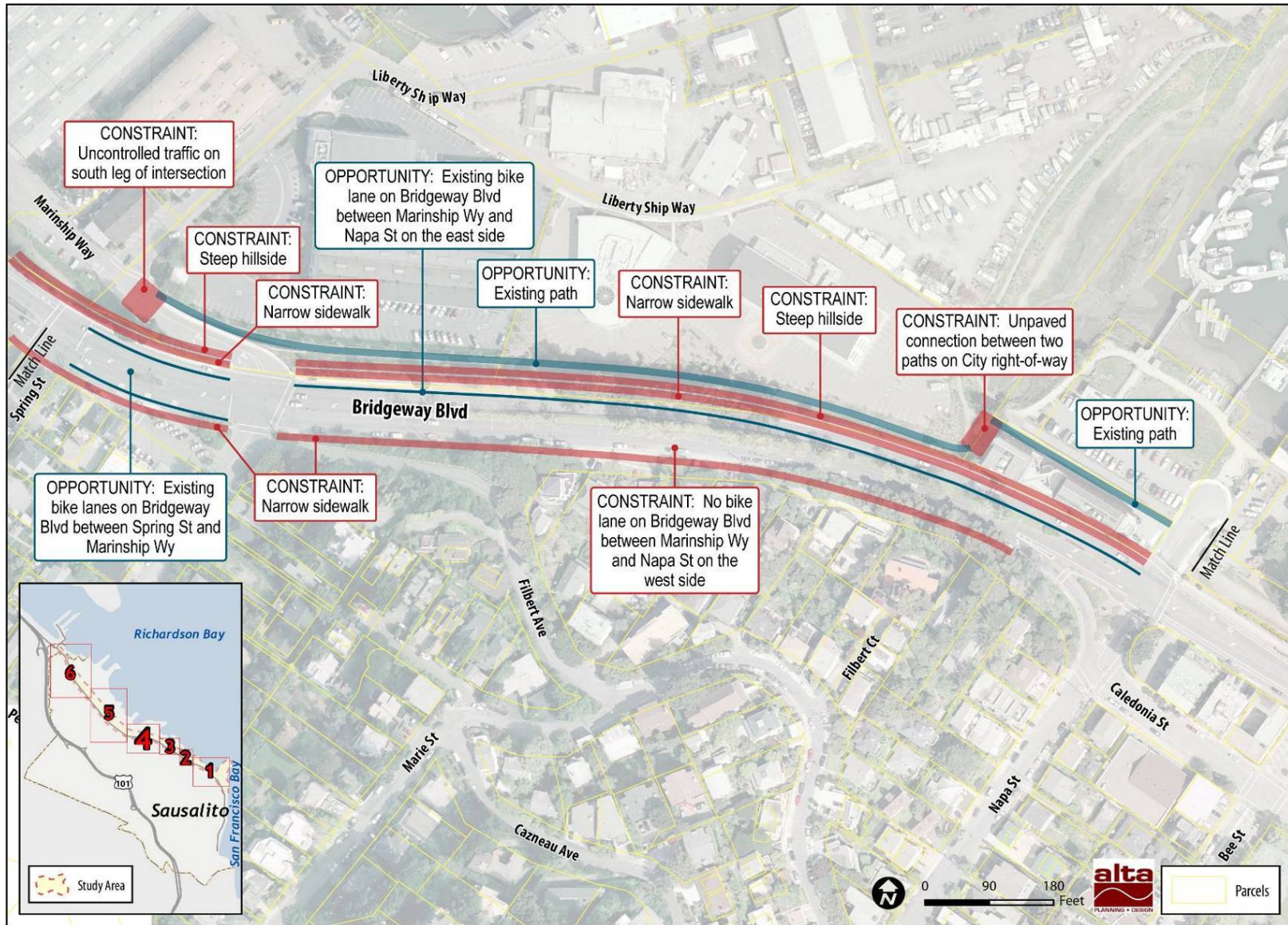


Figure 4-5 Opportunities and Constraints: Segment 4 Napa Street to Liberty Ship Way

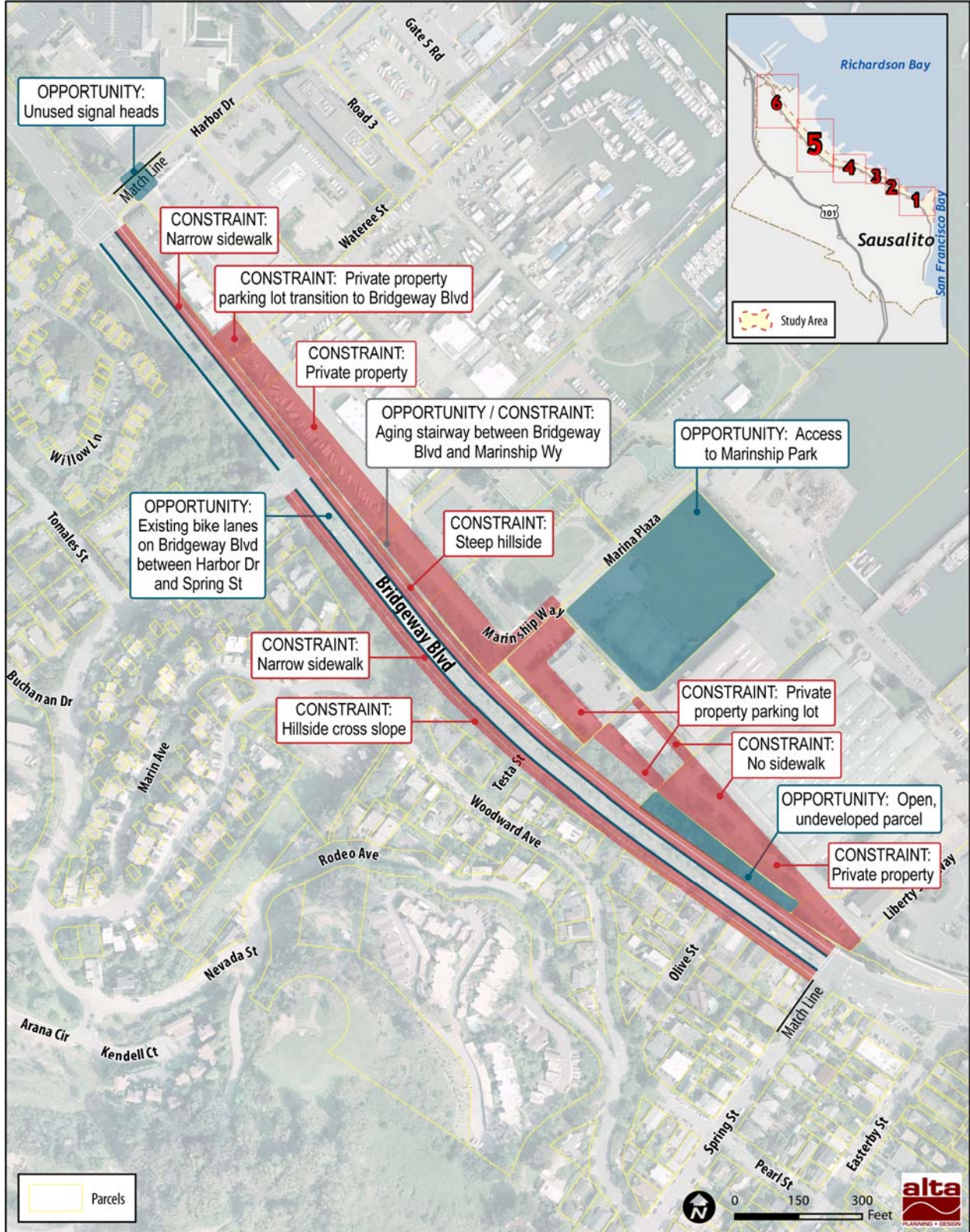


Figure 4-6 Opportunities and Constraints: Segment 5 Liberty Ship Way to Harbor Drive

4.5.1. Opportunities

There are several opportunities for the Path in Segment 5. As mentioned in the segment description, Marinship Way is on/or near former railroad rights-of-way. The route has lower traffic volumes and slower speeds than Bridgeway. There is an underdeveloped strip of land that is below Bridgeway that parallels Marinship Way adjacent to the Bay Model parcel. Marinship Park is also in this segment, a City park with tennis courts and other park amenities. The route is a de-facto street that is not formally mapped but is the result of an access easement. Marine and other businesses rely heavily on the route for circulation and the Bay Model, SWA Associates and other properties rely on Marinship Way for access. Along this segment, there is a stairway linking Bridgeway to Marinship Way and another stair linking Bridgeway to Woodward Avenue. These stairs serve pedestrians connecting between Bridgeway and a path below. There are existing sidewalks and bike lanes on Bridgeway between Spring Street and Harbor Drive. Like Segment 4, there are opportunities to construct wider sidewalks along Bridgeway to accommodate side by side walking.

Other opportunities include modifying traffic signals to enable protected left turns and installing bicycle and Americans with Disabilities (ADA) accessible pedestrian detection at the side street intersections with Bridgeway.

4.5.2. Constraints

Segment 5 has a number of constraints. The Marinship Way corridor, the former railroad route, is almost completely comprised of privately held parcels between Liberty Ship Way and Wateree Street. Before a path can be constructed in this corridor, property easements or right-of-way acquisition will be required through this area. There are no sidewalks on Marinship Way between Liberty Ship Way and Testa Street due to right-of-way constraints and that this portion of Segment 5 is primarily within private parcels. Consideration of aligning the path along the current Marinship Way alignment or through parking lots is an issue in need of further consideration.

Marinship Way intersects Harbor Drive less than 100 feet from the Harbor Drive/Bridgeway intersection. This separation distance is a significant traffic problem for all travel modes. An off street path will likely to need to cross Harbor Drive along the eastern side of Bridgeway, to minimize turning movement conflicts. Transitioning a path alignment from Marinship Way to Bridgeway will need further study to minimize loss of property use by the current property owners. Acquisition of right-of-way and/or easement will be needed.

There steep slope on the east side of Bridgeway down to the Marinship Area as well as on the west side of Bridgeway up to the residential area. This limits consideration of installing an off street path along Bridgeway. Due to these hills, the sidewalks along Bridgeway are constrained to approximately four to five feet wide. These hillsides also prevent road or sidewalk widening without major construction that would include retaining walls for the currently unsupported cut slopes.

4.6. Segment 6 – Harbor Drive to Gate 6 Road

Segment 6 connects Harbor Drive to Gate 6 Road and the Mill-Valley Sausalito Path. In this Segment the former railroad route returns to the east side of Bridgeway. The path is expected to be within the public right-of-way adjacent to Bridgeway. The Gate 6 Road/Coloma Street, Gate 5 Road and Harbor Drive intersections are all signalized. There are traffic signals controlling pedestrian crossings that have parallel lined crosswalks. Gate 5 Road has a pork-chop island where vehicles turning right onto Bridgeway YIELD to oncoming traffic. Major destinations along this section are the businesses on the west side of Bridgeway, offices on the east side of Bridgeway, Charter Schools, non-profits and studios at Martin Luther King Park, A commercial center anchored by Mike’s Bikes at the Gate 6 Road intersection, and the start/end point of the proposed path, the Mill Valley-Sausalito Path.



The sidepath between Harbor Drive and Gate 5 Road features trees planted in the center

4.6.1. Opportunities

Between Harbor Drive and Gate 5 Road there is a wide sidewalk or a sidewalk with an adjacent side path. On the west side of Bridgeway there is a wide meandering sidewalk between Coloma and Harbor Drive. Class II bicycle lanes line both sides of Bridgeway in Segment 6. The City has identified the Gate 5/Ebbtide/Bridgeway traffic signal to receive bicycle detection improvements, though these improvements have not yet been installed.



North of Coloma Street there is a section of existing sidewalk where there is wide public right-of-way

The parcel(s) on the southeast corner of the Bridgeway/Gate 6 Road, which is part of Waldo Point Harbor and a site currently known as the Gates Cooperative, are anticipated to undergo redevelopment in spring 2010. The properties are located outside the city limits and have received development permits. A path could be included on the west side of the property, providing for the bicycle and pedestrian path, but may require revisions to permitted plans.

There is an opportunity to direct bicyclists through improved crossings along southbound Bridgeway Class II lane to the Gate 5 Road/Ebbtide/Bridgeway. Other opportunities include modifying traffic signals to enable protected left turns and installing bicycle and ADA accessible pedestrian detection at the side streets intersections with Bridgeway.

Not all of the intersection corners and driveway crossings in this Segment meet ADA accessibility Standards.

4.6.2. Constraints

Though there is an existing sidewalk/side path on the east side of Bridgeway in Segment 6, sections of the bicycle/pedestrian path of travel have street trees in the center and roots are pushing up the asphalt. The existing path facility does not meet current Caltrans design standard for multi-use pathways. North of Gate 5 Road where there is only a sidewalk, adjacent properties' landscaping abuts the existing sidewalk, narrowing the width of public right-of-way above the Bridgeway curb.

The Gate 6 Road/Bridgeway intersection is a challenging location for all modes of traffic. Southbound bicyclists enter Gate 6 Road from the Sausalito-Mill Valley path and are then forced to choose between an obsolete off-street path or a southbound Class II bike lane on the west side of Bridgeway, south of the intersection. Many bicyclists and pedestrians attempt to turn onto the southbound Bridgeway Class II bike lane without protected movement indications from the traffic signal because current detectors are not sensitive enough to recognize their presence. As described in Section 3.3, there is a history of non-motorized collisions at this location.

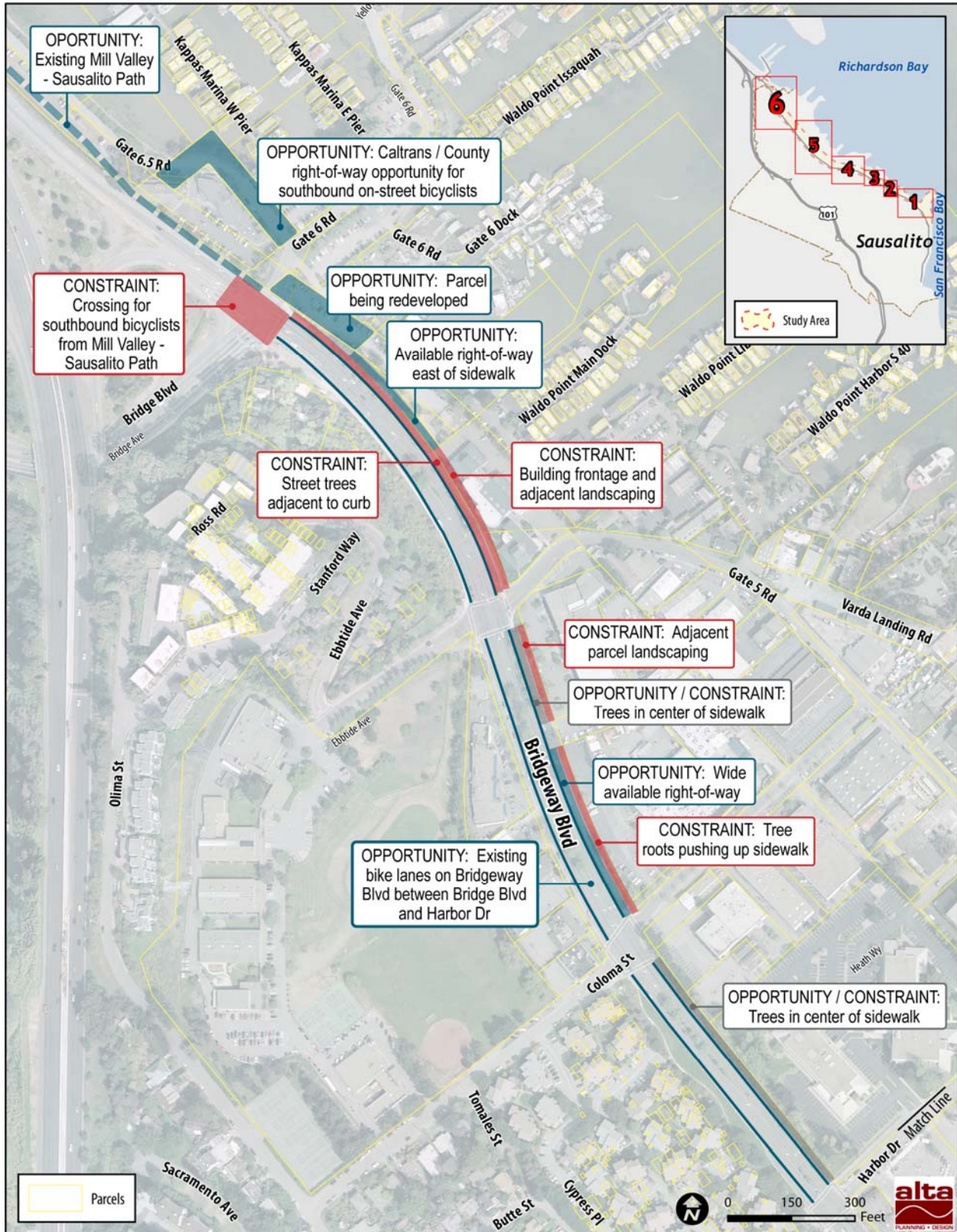


Figure 4-7 Opportunities and Constraints: Segment 6 Harbor Drive to Gate 6 Road

5. Alternative Analysis

In this chapter, alternative alignments for the proposed path are developed and evaluated using four specific evaluation criteria. With the evaluation results, a preferred alternative is identified. This chapter describes the evaluation criteria, three alignment alternatives, and the evaluation process. Also included is a preferred option for connecting the Ferry Terminal to the Mill-Valley Sausalito Path at Gate 6 Road.

5.1. Path Alternatives

Three alternatives for the path between the Sausalito Ferry Terminal and Gate 6 Road were identified through input from City staff, the TAC, and extensive field work. The path alternatives vary in type of potential facility. For example, two alternatives are separated from the roadway and the third alternative is on-street. The three alternatives also vary in location. They all connect the project endpoints but they vary in the routes through the Study Area. This section identifies the three alternatives and touches on the potential bicycle and pedestrian facilities that can make the connection. Figure 5-1 presents the three different alternatives and a more detailed description follows.

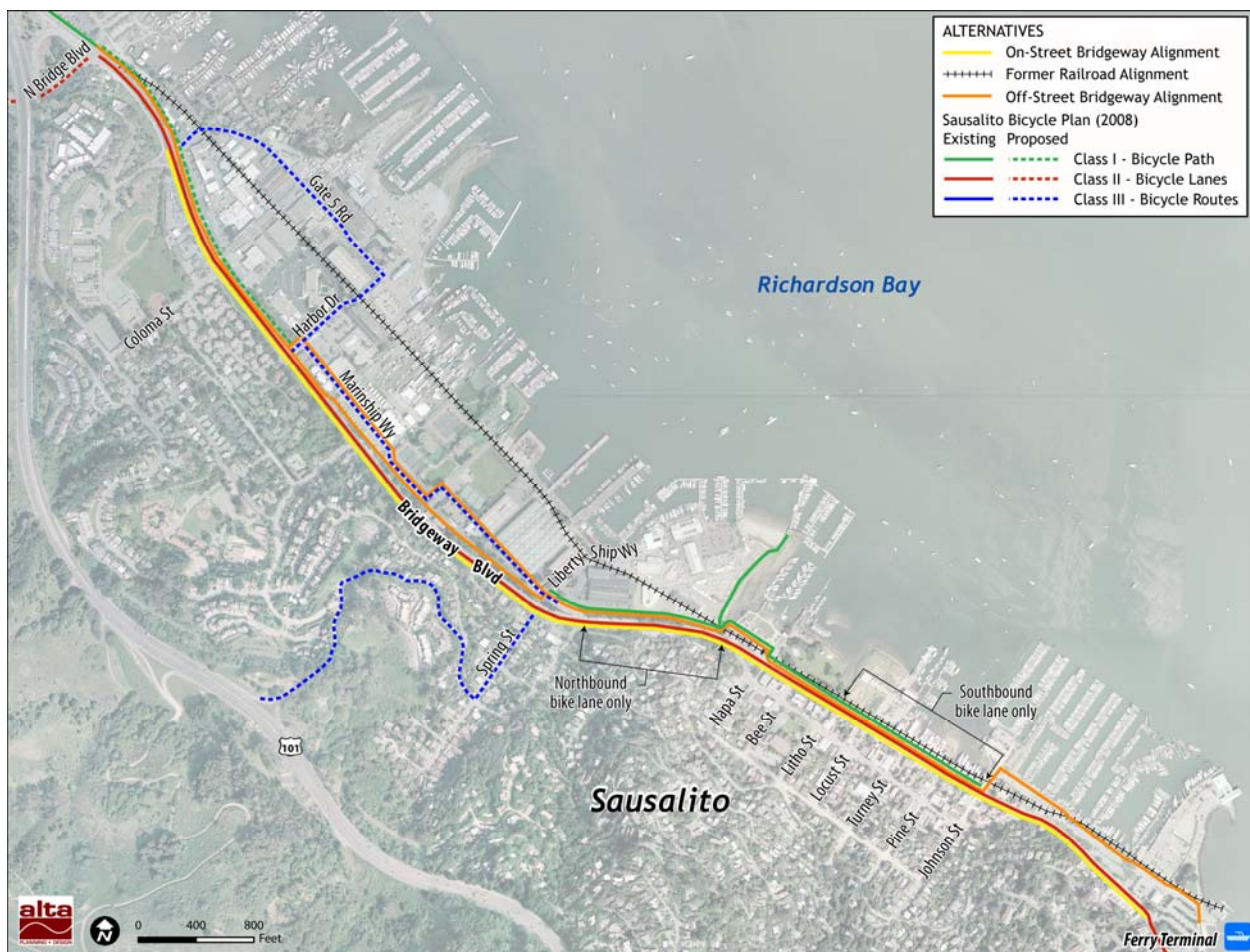


Figure 5-1 Path Alternatives

5.1.1. On-Street Bridgeway Alignment

The On-Street Bridgeway Alignment for the path follows Bridgeway. This connection uses the existing sidewalks along Bridgeway for pedestrians and the Class II bike lanes on Bridgeway for bicyclists. For this alignment, there are existing continuous sidewalks extending along the entire corridor and for bicyclists there are continuous bike lanes except for at two locations – Johnson Street to Litho Street in the northbound direction and Easterby Street to Napa Street in the southbound direction. At these gaps the project would propose on-street bikeway improvements.

5.1.2. Former Railroad Alignment

The Former Railroad Alignment connects through the Project Study Area along the former railroad alignment closest to Richardson's Bay. This alignment was determined using historical maps of the railroad through Sausalito and it connects along the east side of Parking Lots 1 through 3, then connects to Bridgeway and continues parallel to Bridgeway until Dunphy Park when it shifts east through the Marinship. At Liberty Ship Way, this Alignment continues in a line straight from the existing path east of Bridgeway. The Former Railroad Alignment extends north through the Marinship District and existing private parcel buildings and parking lots. This alignment would require improvements to the existing Bridgeway path south of Napa Street and new facilities through the Marinship District.

5.1.3. Off-Street Bridgeway Alignment

The Bridgeway Alignment extends from the Ferry Terminal, on the east side of Parking Lots 1 through 4, connecting to the east side of Bridgeway to Napa Street, along the existing path and through the Marinship adjacent to the toe of slope or along Marinship Way. The alignment then reconnects with the east side of Bridgeway at Harbor Drive. This alignment includes improved facilities along the existing Bridgeway path and new paths south of Johnson Street and through the Marinship District.

5.2. Evaluation Criteria

An evaluation matrix with clearly described criteria is used to evaluate each alternative. These evaluation criteria are based on the overall project goals and used to evaluate each of the three alignments and to help determine a preferred alternative.

5.2.1. Opportunities for Multiple User Groups

As stated in the goals of this study, the project should enhance the local environment and neighborhoods, providing maximum benefit to the public by providing a facility for the widest range of users. Class I – multi-use paths generally provide for the greatest number of users ranging in bicycling skill level. Alternatives that provide opportunities for multiple skill levels and ages of users score higher in the evaluation criteria than those alternatives that provide facilities for limited skill levels and ages of users such as children and bicycle and pedestrian tourists.

5.2.2. Ease of Implementation

Ease of Implementation refers to the timing or coordination needed for developing the path through the Study Area. If a segment of an alternative requires an abundance of planning and negotiation then it ranks less favorably. A lower rank is given to alternatives that rely on the development or redevelopment of Study Area property.

5.2.3. Path Environment

Path Environment considers potential environmental aesthetics while on the facility. Bicyclists and pedestrians prefer areas with natural beauty, for example areas with trees and natural areas. Alignments with more potential for environmental aesthetics score more favorably than those alignments without potential environmental aesthetics.

5.2.4. Public Support

Public support for the alignments is based on input from the project TAC and the City Council in developing the project request for proposals and during presentation of draft study materials. Alignments with more public support score better than those without public support.

5.3. Evaluation of Alternatives

This section presents an evaluation for each of the three alternative alignments using the evaluation criteria. Symbols were used to score the alignments with the criteria ranging a low benefit or a negative impact to a high benefit or low negative impact. Table 5-1 presents how each alternative scored according to the evaluation criteria.

Table 5-1 Evaluation of Alternatives

	Opportunities for Multiple User Groups	Ease of Implementation	Path Environment	Public Support
On-Street Bridgeway Alignment	●	●	○	●
Former Railroad Alignment	●	○	●	○
Off-Street Bridgeway Alignment	●	●	●	●

○ Low ● Medium ● High

5.3.1. Opportunities for Multiple User Groups - Evaluation

Non-secluded Class I- multi-use paths provide the greatest opportunity for multiple user groups walking and bicycling because they are separated from traffic. Class I – multi-use paths provide excellent opportunities for children and less experienced bicyclists like tourists to feel comfortable walking or biking. These facilities

serve the most users when they are not completely secluded so passerby traffic can see wanted or any unwanted activity on the path. The Off-Street Bridgeway Alignment scores the best on this criteria because it is a Class I path in a non-secluded location. Alternatively, the Former Railroad Alignment would likely be an off-street facility but in a more secluded area of the City. Lastly, the On-Street Bridgeway Alignment would not serve as many user groups that an off-street path would serve.

5.3.2. Ease of Implementation – Evaluation

Ease of Implementation refers to associated planning, design, engineering, and construction time and costs associated with a project. The On-Street Bridgeway Alignment offers the easiest implementation opportunities. There is an existing roadway (Bridgeway) that requires improvements. Depending on the types of improvements, these can happen quickly with City support. The Former Railroad Alignment would take the longest to implement. This alignment extends through private property that is developed. The City would need to acquire property or wait for redevelopment to occur for development of the path and this could become a very long time period. The Off-Street Bridgeway Alignment would be easier to implement than the Former Railroad Alignment since a large percentage of this is within public right of way and there is an existing non-standard facility where it is proposed. The challenges occur through the Marinship District where roadway and property changes are necessary for implementation.

5.3.3. Path Environment – Evaluation

The Off-Street Bridgeway Alignment offers the most potential in terms of path environment. There are existing trees along this alignment. The Former Railroad Alignment has some existing trees but through the Marinship District it has no vegetation and the on-street segment has street trees but it is also bordered by the asphalt roadway. The On-Street Bridgeway Alignment scores the lowest path environment score because it is along the roadway, adjacent to passing vehicles.

5.3.4. Public Support – Evaluation

Based on input collected from the City Council in the request for proposal process and during the presentation of draft materials in addition to input from the TAC, the Former Railroad Alignment has the least public support of the three alternatives. This alignment travels through the Marinship District and any project through the Marinship District was discouraged for the project from its initiation. The On- and Off-Street Bridgeway Alignments have mixed public support so they receive a score in the middle.

5.4. Preferred Alternative

Based on the alternative evaluation results, the Off-Street Bridgeway Alignment is the preferred alternative. This route scored the highest or tied for the highest in comparison to the other alternatives in three of the four criteria. Being parallel to Bridgeway, along the existing non-standard facility for some of the alignment, helps rank this project higher than the others. Additionally, it impacts the Marinship District less than the Former Railroad Alignment. While the On-Street Bridgeway Alignment provides improvements to the existing Bridgeway corridor, it does not provide a bicycle and pedestrian facility for less experienced and younger users. The following two chapters present design standards and more details for the preferred alternative.

6. Design Standards

The Ferry Terminal to Gate 6 Road Path Study recommends new bicycle and pedestrian facilities and retrofitting existing bicycle and pedestrian facilities. The majority of the project corridor is a path along Bridgeway between the existing curb line and developed private parcels. Based on the constraints of the Study Area and the preferences of the project Technical Advisory Committee, an innovative design for the path is necessary. The design was developed using existing standards, accommodating local needs and interests including separating bicyclists and pedestrians on the path, site specific considerations, and the ultimate goal of a world class bicycle and pedestrian facility. The design standards in this chapter include both standard and innovative design treatments for the Project Study Area.

6.1. Path Design Standards

The preferred alignment requires the installation of a path with separation between bicyclists and pedestrians. The recommended pathway is a paved path between 15 and 20 feet wide with bicyclists and pedestrians separated by a single stripe or striped buffer. This path meets relevant standards and best practices and uses the corridor space in the most efficient way possible while complying with Caltrans' Highway Design Manual standards. These minimum standards are as follows:

- Path width of eight feet with two foot graded shoulders on both sides.
- Where five feet between the path and the closest roadway travel lane is not attainable due to right-of-way constraints, a landscaped barrier separates the path from the travel or bike lane.

6.1.1. Path Dimensions

The total width of the proposed path cross-section is between 15 and 20 feet wide. As preferred by the project Technical Advisory Committee, the design provides for of bicyclists and pedestrians. Four-feet of path is provided for bicyclists in each direction and four to six feet is provided for pedestrians for new facilities, depending on the right-of-way available. Determination of the width depends on the amount of space available in the study corridor. For example, Segments 2, 3, and 6 are adjacent to Bridgeway so the path dimension depends on the public right-of-way between the curb line and the adjacent property boundaries. Figure 6-1 presents the typical cross-sections. The 15 foot cross-section provides the minimum standards for bicyclists and pedestrians and the 20 foot cross-section provides more space for pedestrians, a buffer from bicyclists, and street trees.

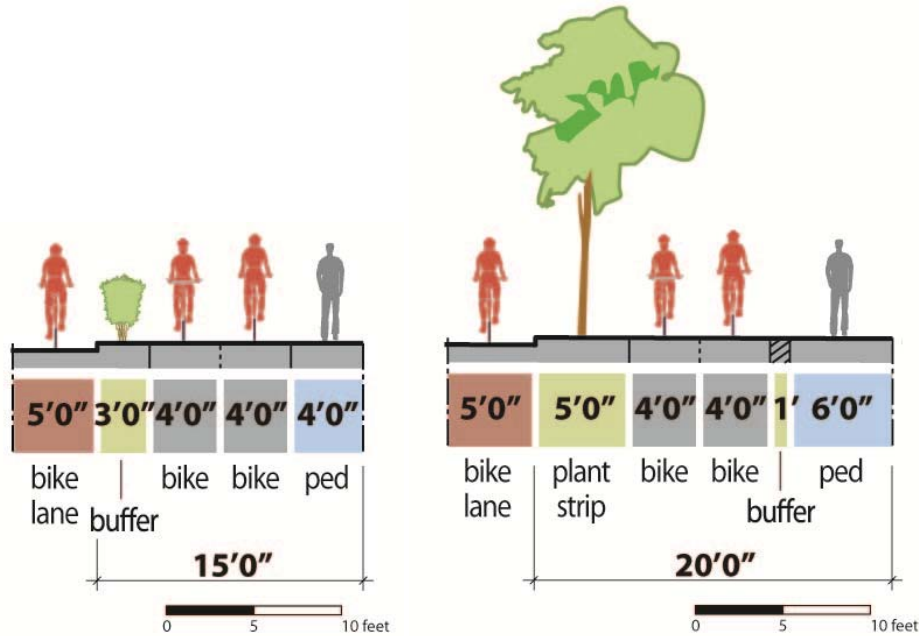


Figure 6-1 Standard Path Cross-Sections for Locations adjacent to Bridgeway with 15 feet of right-of-way (left) and 20 feet of right-of-way (right)

6.1.2. Path Striping and Signage

The separation of bicyclists and pedestrians is recommended where there is ample space along the path corridor. It is recommended because bicyclists travel at higher speeds than pedestrians, causing people walking to feel less comfortable when using a multi-use path. Separation is achievable by striping the path, providing pavement markings where pedestrians should walk and bicyclists should ride and providing signage showing where different users should be located on the path. Where there is enough space available, a buffer is recommended between the bicycling and walking areas of the path. Due to right-of-way constraints in many locations along the corridor, the buffer delineation is only by a painted stripe. However, more right-of-way allows greater separation and could even provide a landscaped buffer.

For the vast majority of the corridor, the Study recommends that pedestrians are on the outside of the pathway, furthest away from the street, and bicyclists are on in the inside of the path closer to vehicle traffic. The project Technical Advisory Committee felt that this would provide the best alternative for pedestrians, providing them a buffer between the walking area and the roadway. This configuration enables pedestrians to access adjacent land uses



Bicycle and pedestrian pavement markings show where users should be on the pathway

directly, without crossing the bicycle path.

Striping

Due to right-of-way constraints on Bridgeway, bicyclists and pedestrians will be located adjacent to one another along the path. To distinguish the different locations for users on the path, striping is recommended. A yellow skipped stripe is recommended to distinguish each direction of bicycle travel separated by a solid white stripe from where pedestrians are to walk along the path.

Standard pavement stencils are recommended for the path to separate the paths of travel for bicyclists and pedestrians. A bicycle stencil delineates where bicyclists ride on the path along with arrows for direction of travel and a pedestrian stencil delineates the pedestrian walking area on the path.

User and Wayfinding Signage

Path signs and markings should include regulatory and wayfinding signs for bicyclists and pedestrians. Sign selection and placement should generally follow the guidelines in the CA MUTCD. All signs shall be retro-reflective on shared use paths. As shown in Figure 6-2 lateral sign clearance shall be a minimum of three feet and a maximum of six feet from the near edge of the sign to the near edge of the path. Mounting height shall be a minimum of four feet and a maximum of five feet from the bottom edge of the sign to the path surface level.

Signage informing users where to ride or walk on the path is recommended. This signage is compliant with the 2009 Federal MUTCD and shown in Figure 6-3. At a minimum, D11-2 and D11-1a are recommended at the beginning of each block or at entrances to the path. The D11-2 is a pedestrian placard and the D11-1a is a bicycle placard. These signs are for pathways that provide separate facilities for different users. They guide users to the path intended for a specific mode, whether bicycling or walking. In addition to the striping and pavement markings, these signs will help users know where to locate themselves while using the facility.



Recommended path striping shows a yellow skipped stripe dividing bicycle travel lanes and a white solid stripe demarcating the pedestrian walkway



With more right-of-way, there is greater availability for wider pedestrian and bicycle paths and a landscaped separation between users as shown in this example from the Cultural Trail in Indianapolis, Indiana

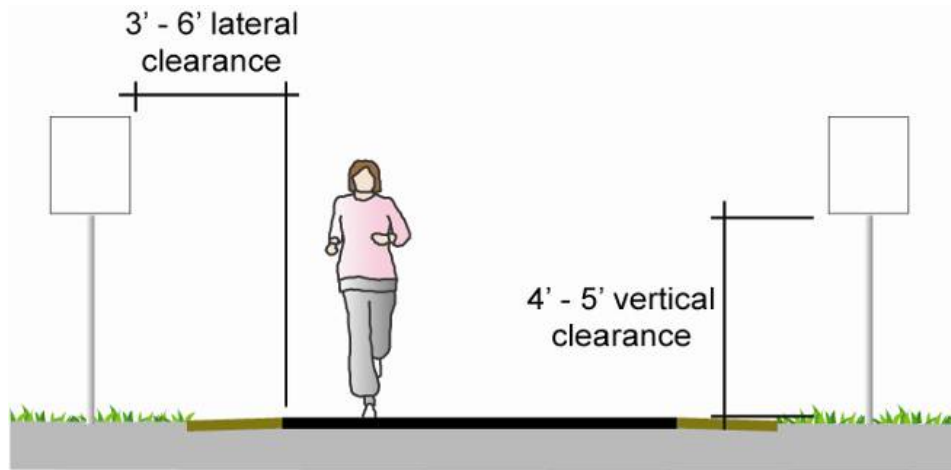


Figure 6-2 Vertical and Lateral Clearances for Signs



Figure 6-3 2009 MUTCD Example of Mode-Specific Guide Signing on a Shared-Use Path (left) Shared-Use Path Guide and User Permitted Signs (middle) and Shared-Use Type Restriction Sign (right)

Wayfinding signage, such as illustrated with **Figure 6-4**, acts as a “map on the street” for cyclists, pedestrians, and trail users. Signage and wayfinding is an important component for trail users. Visitors who feel comfortable and empowered will keep coming back to an area, and an effective wayfinding system is key to creating that comfort level. Wayfinding also plays an important role in trail use safety, connecting users with emergency services. Wayfinding signs are typically placed at key locations leading to and along bicycle facilities, including where multiple routes intersect and at key bicyclist “decision points.”

Signage is most important at locations where there are poor sight lines from the path to cross-traffic (either pedestrian or motor vehicle). All signs should be oriented so as not to confuse motorists and designs (though not the size) of signs and markings should generally be the same as used for motor vehicles. The final striping, marking, and signing plan for the Ferry Terminal to Gate 6 Road Path will be resolved in the design phase of

the path.

6.2. Street and Driveway Crossings

The design of at-grade crossings is important to overall function of the Sausalito path. The project corridor has 12 side-street crossings at crosswalk locations. The City of Sausalito should designate all of these crosswalks as part of the bicycle path, to assist in protecting users while crossing roadways while on the path and to provide clarification to oncoming vehicles. Design of these crossing locations, through signs and pavement markings, should warn motorists of bicyclist and pedestrian presence and warn bicyclists and pedestrians entering the roadway that vehicles may be present. Bicyclists and pedestrians will be required to stop at all intersections and in crosswalks, where bicyclists and pedestrians share the path space, bicyclists must yield to pedestrians.

The Ferry Terminal to Gate 6 Road Path crosses approximately 12 driveways. Given the 1.45 mile length of new pathway, this is a low number of driveways for a developed urban project location. Proper signage and crosswalk markings are recommended at each driveway crossing. At most locations this consists of stop signs and stop bars for vehicles exiting parking lots, before crossing the path. On the path, users should be warned with signage, alerting them of these crossings and to be aware of entering and exiting vehicles. Depending on these volumes, yield or stop signs are recommended for the path at driveway locations.

Chapter 7 provides details on the larger intersections in the corridor, however where details are not provided high-visibility ladder crosswalks are recommended for the path connections. These are two solid white lines, 12 to 24 inches wide, spaced at least 6 feet apart (refer to CA MUTCD Sec. 3B.17) with “rungs.” Width of ladder lines or rungs should be 1 foot, with minimum spacing of ladder lines 1-5 feet. These roadway crossings should also comply with the CA MUTCD and curb ramps that meet the Americans with Disabilities Act Accessible Guidelines are also recommended at all crossings.



Figure 6-4 Wayfinding Signage directs bikeway users in the City of Lafayette.



High Visibility Ladder Crosswalk

6.3. Street Trees

This section provides general guidance to be followed in all tree replacement and new tree plantings required for this project. Specific tree impacts and mitigations are described in Chapter 6. As proposed, the project would result in the loss of approximately 55 street trees (if those existing trees proposed to be located in 5-foot wide landscaped buffers remain) to 95 street trees (if those existing trees proposed to be located in 5-foot wide landscaped buffers are removed) along Bridgeway and Parking Lot 3. This estimate does not include trees on private property between Liberty Ship Way and 2400 Bridgeway, where the Class I path rejoins the street. The project proposes to plant as many as 90 new street trees along the northeast side of Bridgeway, depending on the number and placement of existing trees that remain.

Street trees provide a number of benefits, such as creating neighborhood character, screening unsightly views and buffering people from wind and cars. They enhance the pedestrian environment by providing shade, visual interest and a sense of security from cars on an adjacent roadway. Street trees also provide environmental benefits; they absorb carbon dioxide, improve water quality and provide habitat. If not properly selected, planted or maintained, street trees can block views.

As stated in Sausalito's General Plan, the city's scenic quality is exemplified in part by its garden atmosphere. Within the Study Area, the character of the street trees varies, reflecting the transition from an urban downtown setting near the ferry terminal to a less urban environment near Gate 6 Road. In general, the Study Area contains mature trees of numerous species. Tree spacing ranges from 25 to 50 feet in some areas. Other areas do not include trees. More consistent street tree planting in the Study Area will greatly improve the city's aesthetics and pedestrian and bicyclist comfort. This study proposes street trees where there is available right-of-way.

6.3.1. Tree Planting Guidelines

New street trees should be planted in either landscaped strips or tree wells. Where landscaping is adjacent to the street and on street parking is not allowed, a continuous landscaped strip is recommended. Landscaped strips with trees should measure a minimum five feet in width. Trees should be located at a regular spacing with adjustments made to avoid driveways, utility poles and other fixed elements where necessary and aligned where possible with striping and on street parking. Any adjustment to the recommended tree spacing should be done in full block increments. Existing trees that are dead, diseased or on the City's undesirable species list should be removed and replaced with the species identified for the particular block or street segment.

Tree Location and Pruning

Tree planting and pruning will have a significant effect on the character of the street and path users' experience. Specific tree planting and pruning guidelines are as follows:

- Trees should be a minimum 24-inch box size at planting.
- Trees should be regularly spaced at 25 feet on center (or more as noted for species). Spacing may need to be adjusted slightly to avoid driveways, utility poles and other fixed elements.
- Trees should be located at least 15 feet from utility poles.

- Trees should be located at least 10 feet from the edge of any driveways.
- Trees should not be planted at intersections and street corners within the corner triangle.
- Branching height of mature trees must not interfere with visibility of traffic control devices.
- Trees should be located a minimum of 30 inches from the face of curb.
- Tree trunks should be located so as to maintain a minimum two feet of lateral clearance from the path edge.
- The branching height of mature trees on the street side should be maintained at no less than 14 feet above the street.
- The branching height of mature trees should be maintained at no less than ten feet above the path.

Tree Selection

Street tree selection is beyond the scope of this study. Generally, the selected tree species should complement the streetscape and the neighborhood. Street trees should not displace pavement or drop seeds, seed pods or fruit that could create tripping hazards or otherwise obstruct the path. It is assumed that the selected trees will not be any of the City of Sausalito's undesirable trees: Blue Gum Eucalyptus, Monterey Pine, Monterey Cypress or Coast Redwood, Black Acacia, Bailey Acacia or Green Wattle. Existing, mature trees should be incorporated into the overall plan whenever possible.

Tree Wells and Grates

When used, tree wells should measure approximately four feet by four feet and be covered with uncoated cast iron grates. Existing mature trees that are to be retained and located adjacent to on street parking should be fitted with grates or surrounded by an ADA acceptable surface such as decomposed granite to ensure an even pedestrian surface. All grates adjacent to the path should be flush with the level of the surrounding path surface, and be located within the furnishings zone.

Tree Guards

Tree guards are structures placed over or around small trees for protection against browsing animals or trampling in high use areas. Tree guards should be installed where appropriate to protect trees and ensure their longevity.

Structural Soil

Structural soil is a mixture of crushed stone, clay loam and a hydrogel stabilizing agent. When installed under paving, structural soil allows tree roots to grow out of the tree well and under the adjacent paved surface without causing the pavement to heave or buckle. This greatly increases the long-term health of the tree and ensures that the paved surface remains even. Like other soils, structural soil can be compacted to meet engineering requirements for paved surfaces. However, compaction of non-structural soil often inhibits root growth, causing roots to be contained within a small useable volume of soil without adequate water, nutrients or oxygen. Subsequently, urban trees planted in non-structural soil with most of their roots under pavement tend to grow poorly and may die prematurely. It is strongly recommended that structural soil be used for all new street tree plantings.

6.4. Landscape Buffer

Where the separation between the path and the roadway cannot accommodate a five foot buffer with street trees, three feet with a landscape buffer separates the path from the roadway. Chapter 1000 of the Highway Design Manual states, *A wide separation is recommended between bike paths and adjacent highways. Bike paths closer than five feet from the edge of the shoulder shall include a physical barrier to prevent bicyclists from encroaching onto the highway.* Bridgeway is not a highway but it is a regional arterial road. Therefore Caltrans recommends a barrier between the path and the roadway. This barrier can be a variety of different improvements such as landscaping, a railing, or a fence. Caltrans recommends that the barrier be 42 inches in height. Based on input from the Technical Advisory Committee and the existing aesthetics in the corridor, a landscape buffer is recommend where there no on-street parking spaces buffering the path from the roadway and there is less than five feet of space between the path and the curb line.

6.5. Developing a Path Theme

A path theme creates a cohesive and memorable path, while establishing a distinctive, clearly recognized identity or “sense of place.” Numerous influences can inspire a path theme. It can draw on the areas’ cultural or historical context thereby giving a sense of continuity within and connection to the larger region. The Ferry Terminal to Gate 6 Road Path theme could draw inspiration from current or past cultural characteristics of the city, its ecology or setting. The path identity could reveal natural, historic and cultural patterns in the landscape. The Ferry Terminal to Gate 6 Road Path is a portion of the North-South Greenway through Marin County. If chosen for this path, the North-South Greenway name and theme will give users a seamless experience while traveling the path from Sausalito to Novato and reinforce the path’s function as a regional connection. Once established, the theme brands a path segment as a unique place and provides a reason for people to experience it.

A unifying theme also informs subsequent design choices from site furnishings to interpretive information and art installations. The path theme can be expressed in building materials, craftsmanship, how the path responds to climate (ex: use of shade structures, color or drought-tolerant plantings) and natural, historic and cultural references, to name a few.

6.5.1. Art Installations

Local artists can be commissioned to provide art for the path and its theme, making it unique. Many shared use path art installations are functional as well as aesthetic, as they may provide places to sit and play on. Artistic themes can draw upon the history or environmental surroundings of Sausalito. This type of art can add to the path experience, especially for children. Art is best suited in



Art Installations like the Elephants in Vina del Mar Plaza, originally made for the 1915 Panama Pacific Exposition in San Francisco, can provide attractions on the path and recall historical events.

high visibility areas, such as intersection access points and areas near the Ferry Terminal at the south end or the Mill-Valley Sausalito Path at the north end of the path. In general, all art installations should be located three to six feet from the edge of the paved surface.

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