Highway 1 Safety and Mobility Improvement Study: Phase 2

FINAL DRAFT

San Mateo County Midcoast
Montara
Moss Beach

Accepted by the San Mateo County Board of Supervisors on November 20, 2012

Prepared by

Local Government Commission
Nelson\Nygaard Consulting Associates
Opticos Design, Inc.
Walkable and Livable Communities Institute
Urban Advantage

Highway 1 Safety and Mobility Study

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Views and opinions presented in this report do not necessarily represent the views or opinions of Caltrans or the California Business Transportation and Housing Agency.

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Introduction

This report describes the background, process, and outcomes of the planning effort conducted in Moss Beach and Montara in Spring and Summer, 2011. It focuses on motor vehicle, pedestrian and bicycle safety and mobility challenges and solutions for Highway 1 and surroundings between Half Moon Bay Airport and the Devils Slide area in unincorporated coastal San Mateo County. It completes the second part of a two-phase study. The first phase, completed in 2010, focused on Highway 1 safety and mobility from the airport south to Frenchman's Creek Road.

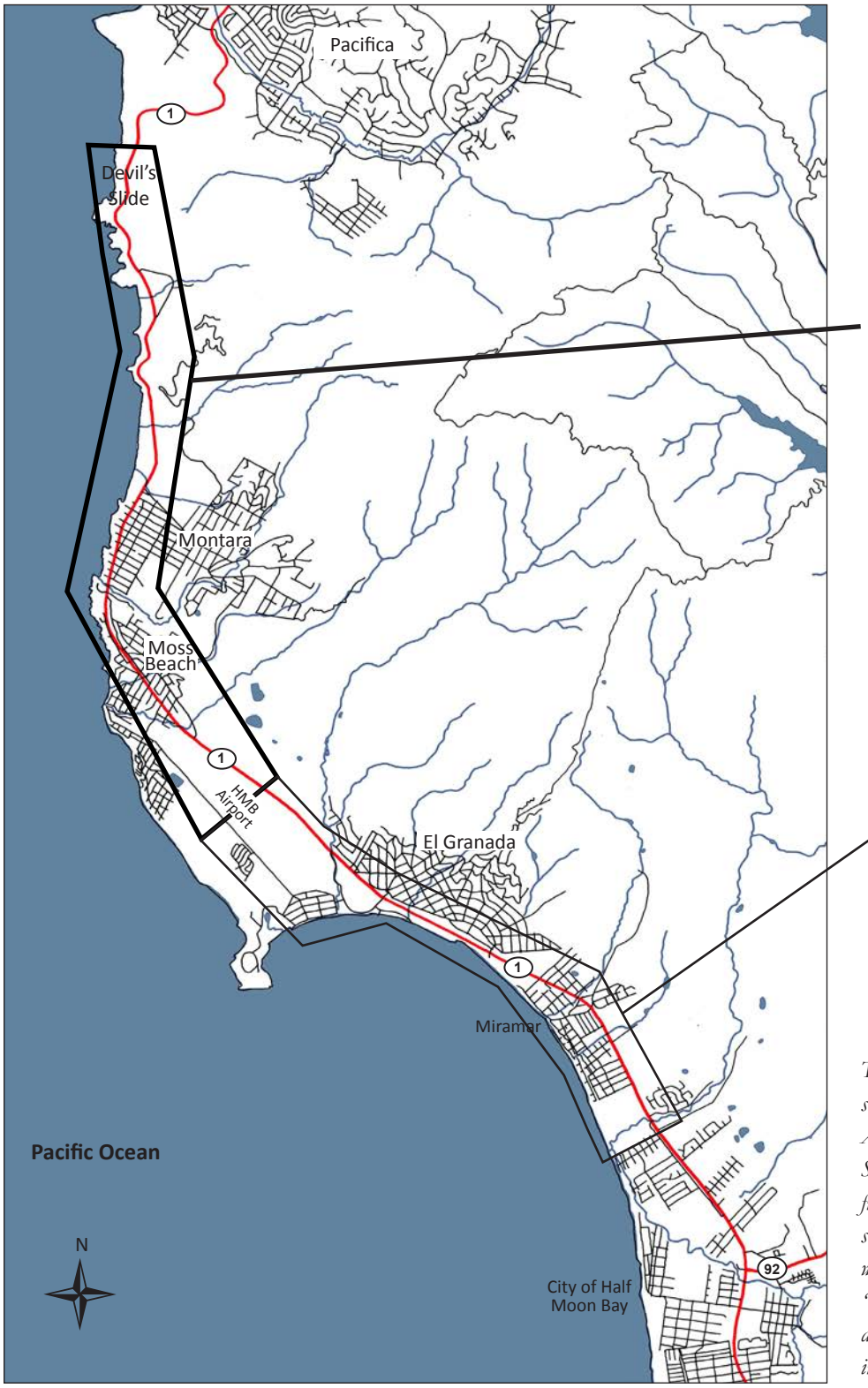
This document stems from an intensive participatory planning process, funded through a Community Based Transportation Planning Grant provided by the California Department of Transportation to San Mateo County, in partnership with the Local Government Commission (LGC). LGC is a Sacramento-based nonprofit organization that works with local leaders and agencies to build livable communities. LGC assembled a multi-disciplinary consultant team to develop concepts and recommendations. The team included Opticos Design, an urban design, planning and architecture firm based in Berkeley; Nelson\Nygaard, a multimodal transportation planning and engineering firm based in San Francisco; and Walkable and Livable Communities Institute, an educational nonprofit organization based in Port Townsend, Washington.

Study Area

The study area encompasses an approximately 5.5 mile segment of State Route 1, referred to throughout this report as Highway 1, in San Mateo County from Half Moon Bay Airport through the Devil's Slide improvement project. The area is the focus of the second part of a two-phase study. The first study, completed in February 2010, focused on the highway from Half Moon Bay Airport south to Frenchmans Creek Road, passing Pillar Point Harbor and Princeton and through the communities of El Granada and Miramar. During the course of this current study, the consultant team had the opportunity to revisit and amend some of the information and recommendations from the earlier study. Accordingly, elements from the earlier report are included in this report.

The study area includes two unincorporated coastal villages, Montara (population approximately 3,000) and Moss Beach (population approximately 2,000). Highway 1, also known locally as Cabrillo Highway, is a regionally significant roadway serving through and local traffic, providing principal access between neighborhoods, the communities, and regional destinations.

Study Area Boundary



The map shows the extent of the study area, from Half Moon Bay Airport, north, through the Devil's Slide Area. The area shown below, from Half Moon Bay Airport, south, to Frenchmans Creek Road was the focus of the previous report, "Highway 1 Safety and Mobility and Improvement Study," completed in April, 2010.

Multiple agencies have regulatory authority in the study area. The unincorporated villages of Moss Beach and Montara are governed by San Mateo County. Caltrans maintains and operates Highway 1, and San Mateo County maintains and operates most of the community roadways. The study area is within the California coastal zone and permit appeal jurisdiction of the California Coastal Commission. Large parcels adjacent to the highway, including Montara State Beach and McNee Ranch State Park, are under the auspice of California State Parks. Another large area, Rancho Corral de Tierra, was recently made part of the Golden Gate National Recreation Area under the management of the National Parks Service.

The highway is generally a two-lane road with left-turn pockets and right-turn lanes at some intersections. Conditions vary from rural, undeveloped surroundings, where traffic movement is typically free, to more urbanized settings in the village areas, with cross traffic, parking, driveway access, and periods of congestion during school and work commute times. There are periods of gridlock on weekends with good weather and during annual events at Half Moon Bay Airport, Pillar Point Harbor and the City of Half Moon Bay. Visitors park in designated lots and informally along the highway shoulder at points along the route for trail and beach access. Through bicyclists make their way along the coast using the road shoulders, which are narrow in topographically constrained segments. Pedestrian and bicycle activity is prevalent in the community areas and at locations with access to beaches, surfing, hiking and trail-biking routes.

2010 Caltrans data indicate that the average daily traffic volume on the highway is 13,900 vehicles south of the intersection with Vallemar/Etheldore Streets in Moss Beach, and 15,000 north of the intersection. During the month of heaviest recorded traffic flow, the volume increases by 600. Posted speed limits vary from 45 mph heading south from Devils Slide through Montara, to 50 mph south of Montara through Moss Beach, to 55 mph south of Moss Beach past Half Moon Bay Airport.

At the northern end of the study area a new tunnel and bridges bypass the portion of the Highway 1 roadway at Devils Slide that has been subject to landslides are expected to open in 2012. The bypassed portion is being relinquished to the County and converted to a public scenic area, hiking and biking trail, which will attract new use. Heading south, Gray Whale Cove State Beach and Montara State Beach are popular destinations and activity generators between Devil's Slide and Montara. The recent transfer of Rancho Corral de Tierra land east of the highway to the National Park Service may attract additional recreational visitation to this area.

In Montara, residential neighborhoods are accessed by the highway and concentrated on the east side. A restaurant and beach parking are located on the west side of the highway at the northern end of the community. Further south, an inn, neighborhood market and gas station, food establishment and small retail store front the east side of the roadway. In Moss Beach, the highway provides access and bisects residential neighborhoods on either side. A food establishment and a gas station front the west side of the highway, and a post office, sheriff substation, food establishment, neighborhood market and other services are separated from the highway by a parallel frontage road on the east side. Point Montara Lighthouse, J. V. Fitzgerald Marine Reserve, and Seal Cove are popular destinations and activity generators in the Montara and Moss Beach areas.

In addition, a proposed office park and wellness center west of the highway between Princeton and Moss Beach has the potential to add more users to the highway.

Study Purpose

The purpose of the study is to develop potential solutions for Highway 1 to better serve all users. Planning efforts by San Mateo County and other agencies are shaping development, recreation, infrastructure, and environmental policies within the study area. A community-based planning process was used to engage residents and stakeholders in developing transportation improvement strategies consistent with established regional policies. This process is described in the next section.

One of the biggest challenges is that the corridor must provide for commuters during the week and tourist traffic on weekends, while maintaining safety and comfort for residents. It must also provide for pedestrians and bicyclists of all ages and abilities who are using the highway right of way or trying to cross.

The highway lacks sidewalks or consistent, well-defined shoulder space in areas where pedestrians need to walk along the roadway and for bicyclists who use the roadway. The area also lacks easily recognizable, direct alternative walking and biking routes off the highway that link destinations. There are no stop controls or treatments at uncontrolled locations (with the exception of "pedestrian ahead" signs alerting southbound motorists entering Montara and motorists approaching a crossing at the Gray Whale Cove parking lot) to help pedestrians and bicyclists safely cross the highway. Formal, informal, and illegal parking along the highway, especially near beach and trail attractions, generate additional crossing issues, as well as points of conflict between vehicles and traffic circulation issues.

Highway traffic speed is cited by residents as a challenge throughout much of the study area. There are few visual cues or physical treatments to encourage driver speed moderation and awareness of the transition from open highway conditions to places of increased cross traffic, vehicles entering and exiting the highway, and higher pedestrian and bicycle use.

Finally, considerable discussion and planning activity has occurred to explore and identify the alignment for a continuous parallel multi-modal trail from the City of Half Moon Bay to Montara. The trail would run predominantly on the east side of the Highway, except where constraints or opportunities may make a west side alignment more feasible or desirable. In addition, portions of the California Coastal Trail have been developed or are planned on the west side of the highway, but some extents may need to occur on the east side of the highway (perhaps merging with the proposed parallel trail) where there is insufficient space between the highway and coastline for a continuous alignment. While this trail system will provide safe routes for non-motorized users and an alternative to some car trips on the highway, trail access has the potential to increase pedestrian and bicycle crossing demand at some points along the corridor. Anticipating these potential connections and developing strategies for facilitating safe crossings at these locations will be needed.

Study Process

The consultant team studied the Highway 1 corridor and surrounding conditions and developed concepts through an intensive community-based planning process. This included a concentrated series of meetings, presentations and workshops that engaged residents, stakeholders and agencies in a variety of activities to identify concerns, priorities, and potential solutions.

The County and LGC convened an advisory group in advance of the community meetings and workshops that included staff from the County and other key agencies, and community members to learn more about key issues and how to engage residents in the upcoming events.

The events began with a series of focus group interviews on April 28 and 29 at the Granada Sanitary District office and Farallone View Elementary School. Groups included: agencies and districts; parks, trails, and open space; businesses; emergency response; and school representatives. The facilitator encouraged participants in each group to share their knowledge, concerns, and ideas about the study area.

The Kickoff Community meeting was held Thursday evening, April 28, at El Granada Elementary School. Participants described their vision for how they would like the area to be twenty years in the future and viewed a slide presentation highlighting study area issues and techniques used in other communities. They took part in activities to identify values they held in common for the area and brainstormed priority issues to address in developing proposed improvements.

Top values held in common included:

- Ocean
- Open Space
- Small Community
- Quiet/Slow Pace
- Trails
- Rural Character

Top priorities ordered according to vote included:

- Bike lanes along highway
- Devil's Slide south portal pedestrian crossing

Outreach: March - May, 2011

- **Advisory Group Meetings**
- **Focus Group Meetings**
- **Kickoff Community Meeting**
- **Community Design Day**
- **Open Studio Hours**
- **Closing Presentation**

Top and middle photos. *Focus meeting with agency and district representatives and with emergency responders.* ***Bottom photo.*** *Residents post values they hold in common at the Kickoff Community Meeting.*

Photos top to bottom. *Participants vote on leading issues to address at the Kickoff Community Meeting; participants review conditions during the Saturday walking audits in Moss Beach and Montara; residents develop ideas around table maps.*

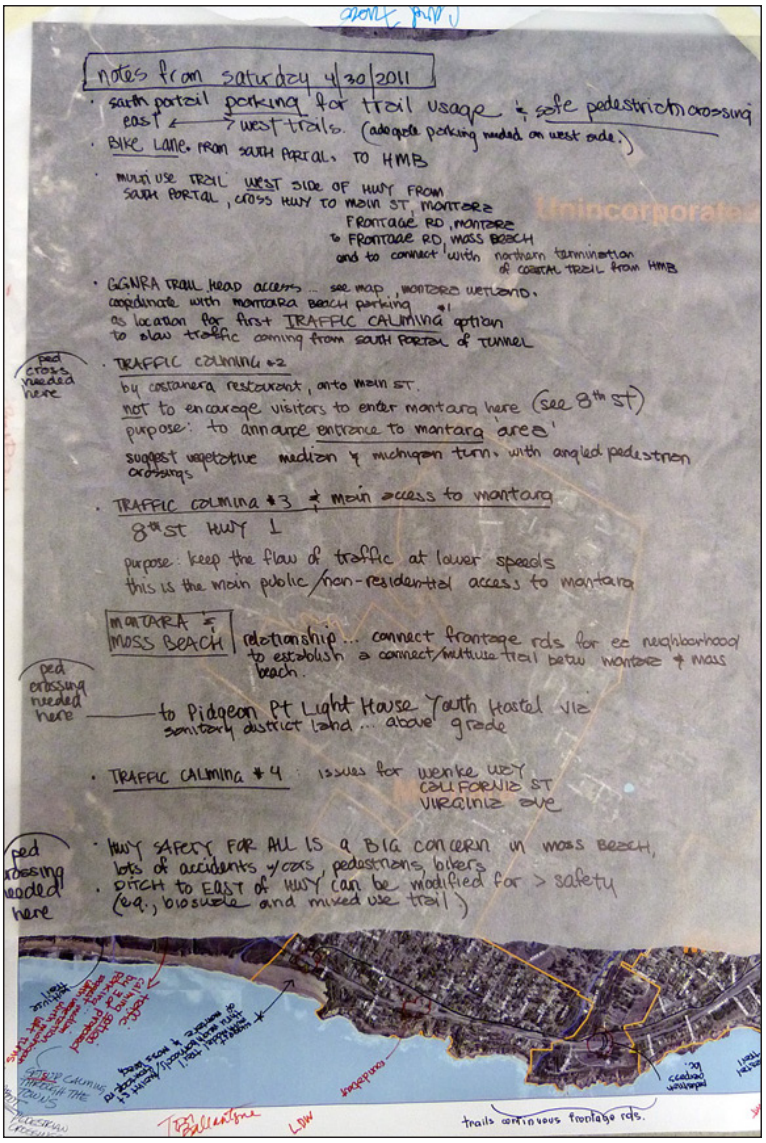
- Complete coastal trail thru Princeton (Phase 1 study area)
- Connect frontage roads in Montara/Moss Beach
- Safe crossing at Surfer's Beach (Phase 1 study area)
- Trails with bioswales
- Montara Lighthouse and hostel entry crossing
- Reduced light pollution
- Crossing to post office in Moss Beach
- Montara Main Street/Second Street beach crossing
- Safe crossing near sheriff's office in Moss Beach
- Address Montara State Beach parking
- Trail access to parking
- Less/lower speeds
- Same speed
- Mobility solutions/options for all users (improve public transit)
- Consistent appearance between southern (Phase 1 study area) and northern segments (Phase 2 study area)

On Saturday, April 30, participants met at Farallone View Elementary School and joined consultant team members in group walking audits in Montara and Moss Beach. They observed traffic, bicycling and pedestrian conditions in the field, discussed concerns, and considered ideas for resolving problems. Afterwards, participants viewed a presentation recapping the previous activities and illustrating tools and strategies for addressing issues within the study area. Participants then worked in groups at map stations, developed suggestions for improvements, and presented their ideas.

In the weeks that followed, the consultant team reviewed the input from the meetings, activities and field observations, studied planning documents and resources, and met with Caltrans staff at the district office in Oakland. The team returned May 23 - 26 and set up a studio in Moss Beach, working daily to translate the input into design concepts and recommendations. Team members met with Spanish-speaking residents in Half Moon Bay and the public was invited to the studio for evening reviews of work in progress. Thursday evening, May 26, team members presented preliminary plan concepts for comments in a closing public meeting at El Granada Elementary School.

In the months following the workshops, the consultant team refined the concepts, completed drawings and prepared recommendations for improvements. The results are presented in the chapters that follow.

Photos top to bottom. *A participant presents ideas from one of the table map groups; a design team member tests potential solutions at the studio in Moss Beach; a design team member presents work in progress for feedback at the studio.*



A marked-up table map with notes from the Saturday workshop is shown above.

Goals

Several prominent themes emerged from the meetings and workshops, field assessments and review of area studies and planning materials. These include the desire for safe crossings and parallel trails that provide non-motorists with alternative routes to the highway, and improvements to the highway itself for bicyclists, especially in constrained areas where direct, parallel routes are infeasible. Many meeting and workshop participants expressed the need for reduced traffic speed in community areas, while some expressed concerns about the impact lower speeds would have on motor travel time. Many also identified the need to better organize and manage the impact of parking and circulation in high demand areas and to address school related traffic. Finally, residents, stakeholders and advocates stressed the importance of coastal preservation and maintenance of small community character.

In response, the following overarching and overlapping goals form the basis for the Study recommendations and proposals. Each goal is a statement of a desired end and accompanied by an objective intended to achieve progress toward that end.

Goal 1: Increased pedestrian, bicycle and vehicle safety along Highway 1.

> **Objective:** Introduce appropriate tools and strategies to encourage motor speed consistency and moderation in community areas and to improve visibility and safety for pedestrians and bicyclists in areas where they are prone to cross or must travel in or along the roadway.

Goal 2: More transportation options for those that cannot, or choose not to use vehicles for local trips and commuting.

> **Objective:** Establish a complete pedestrian and bicycle travel network, built upon existing and planned trails, streets and other opportunity sites.

Goal 3: Safe and efficient traffic circulation.

> **Objective:** Identify locations for organized parking in high visitation areas and locations for managing street and driveway access and vehicle turning movements entering and exiting the highway.

Goal 4: A highway corridor that responds to both natural and built contexts.

> **Objective:** Identify and implement design strategies that reflect and reinforce the corridor's surroundings, which include rural, open space conditions and areas with greater land use intensity and diversity of users. Identify long-term adaptation strategies to address coastal erosion and the dynamic coastal environment.

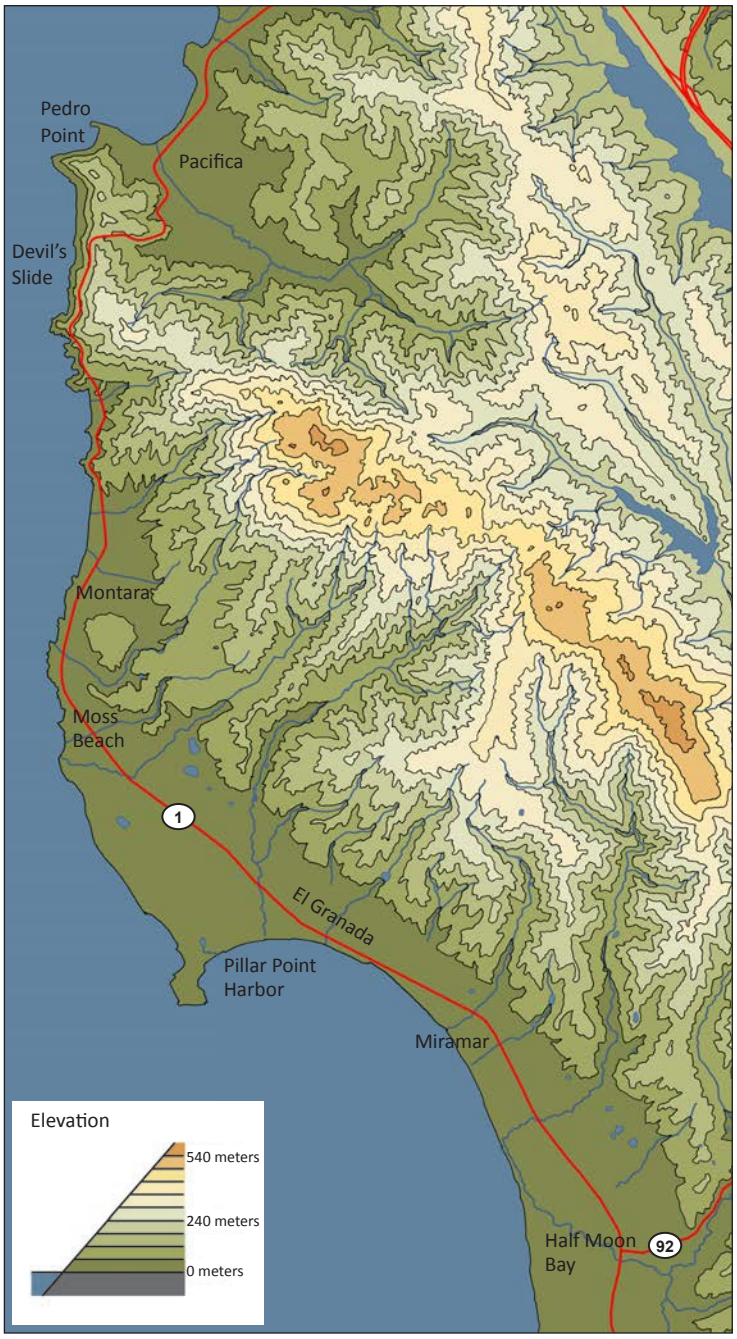
Highway 1 Characteristics

Profile

The highway's context, function and roadway classification influence the type of roadway changes that can be considered. Regarding classification, California statute designates State Route 1 from Higgins-Purissima Road south of the City of Half Moon Bay to I-280 as an Expressway, which encompasses the entire study area. The California Department of Transportation Highway Design Manual defines an expressway as "an arterial highway with at least partial control of access, which may or may not be divided or have grade separations at intersections."

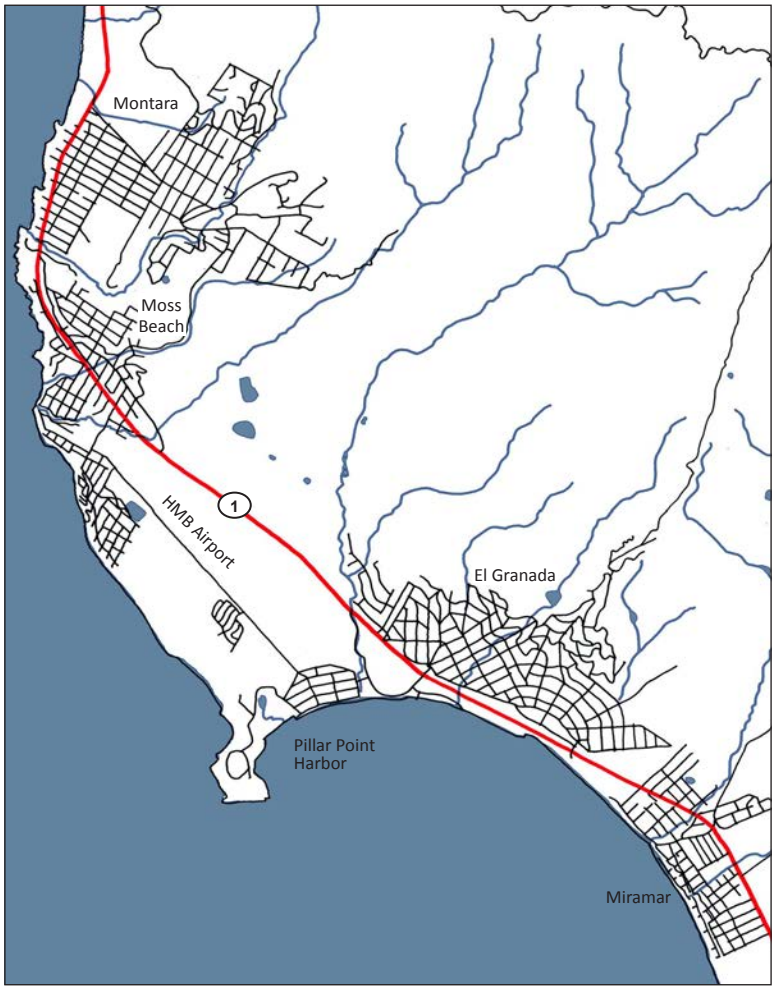
The relatively broad definition of an Expressway, combined with the highway's current function and operation, suggest flexibility in the types of improvements that might be considered for the roadway. As it exists today, Highway 1 has few access controls (limited vehicular access points to adjacent land parcels) and is undivided from Pacifica to Half Moon Bay. There are no grade separated intersections. Access points are relatively high in the coastal communities. The highway passes through and connects to grid street patterns in Montara, Moss Beach and Miramar, with frequently spaced intersections and numerous public and private driveways and other access points from Montara to Half Moon Bay.

At the northern end of the study area, the highway passes through the steep, unstable geological formation referred to as Devil's Slide. A long history of closures due to



In the topographic map above Highway 1 winds through steep terrain past the Pedro Point headlands and Devil's Slide area, and passes through generally flat terrain from Montara to Half Moon Bay.

Community Street Patterns



Highway 1 is the only continuous route that carries through traffic along the midcoast. It also serves as a primary arterial for local traffic, with numerous intersections within midcoast communities.

rock slide and land slippage prompted construction of a bridge and two 30-foot wide tunnels, one for northbound traffic, and one for southbound traffic, to bypass the problem area. The bypassed section of roadway will be available for public access and recreational use following the planned tunnel opening in 2012.

Heading south, the corridor transitions to relatively gentle grades and balanced horizontal alignment, with rural highway super-elevation (cross-slope) at curves to serve higher speeds. The roadway provides a continuous route for through traffic, but also serves as a primary route for local traffic. Bicyclists and pedestrians use the highway shoulders and cross at multiple locations where the highway bisects or separates neighborhoods, and where residents and visitors access the ocean, beaches, trails and the harbor from the east side of the highway.

A summary of general corridor observations and issues from north of Montara to the City of Half Moon Bay is included on the next page.

Corridor Observations and Issues

North of Montara State Beach
- Grade changes and curves
- Sections with narrow shoulders
- Bicycle use
- Pedestrian crossing conflicts at beach and trail access areas
- Informal shoulder parking

Montara
- Relatively high number of accesses
- No sidewalks, sections with narrow shoulders
- Sight distance challenges at cross streets
- Pedestrian crossing conflicts
- Turning vehicle conflicts at Lighthouse and Hostel

Moss Beach
- Relatively high number of accesses
- Cross traffic
- Frontage street
- No sidewalks
- Pedestrian/bike crossing conflicts

El Granada
- "Surfer's Beach" erosion
- High pedestrian/bike use, crossing demand
- No sidewalks
- Two signalized intersections
- Peak hour, weekend and seasonal congestion
- Informal shoulder parking

Miramar to Half Moon Bay
- Relatively high number of accesses
- Turning traffic at driveways and streets
- Sight distance challenges at cross streets
- Signalized intersection

Caltrans Policy

- **Context Sensitive Solutions (CSS)**

Caltrans policy supports transportation decision-making and design using the principles of Context Sensitive Solutions (CSS). CSS considers the communities and lands around highways. This approach addresses the physical settings and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. Caltrans' Context Sensitive Solutions and design direction and informational resources are available at: http://www.dot.ca.gov/hq/tpp/offices/ocp/css.html

- **Complete Streets**

Caltrans Deputy Directive 64-R1, "Complete Streets: Integrating the Transportation System," was issued in 2008, directing the agency to support increased mobility and access for all users on Caltrans roads. A complete street is defined as "…a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility." Caltrans' Complete Streets policies, design direction and informational resources are available at: http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets.html

Context Zones

As previously discussed, while Highway 1 within the study boundaries is designated an expressway, the surrounding land uses, historic development patterns, and roadway characteristics vary throughout the corridor. The different areas can be described as context zones with similar characteristics and user needs. Motor, pedestrian and bicycle traffic function differently within each of the context zones.

Understanding subareas of the corridor as context zones provides guidance for potential changes to consider that address the safety and experience of all users, environmental and scenic quality, and community character. Three principal context zones for the study area include: Rural Zones, Community Fringes, and Community Zones. Urban/Suburban zones are found in the City of Pacifica north of the study area and the City of Half Moon Bay south of the study area.

Rural Zones

Rural zones are sparsely developed or undeveloped with adjacent agricultural or recreational uses. In rural zones, there are generally few pedestrians except where there are points of access to recreation spots. Likewise, bicyclists are fewer, though through cyclists use the shoulders for recreation riding and transportation. Vehicle speeds tend to be high.

Community Fringes

Community fringes are transitional segments approaching community edges, where travelers encounter intersections and increasingly developed land uses. Vehicles speeds in fringe zones leaving community areas tend to increase. Vehicle speeds in fringe zones approaching community areas should tend to decrease as drivers detect the changing context and anticipate potential conflicts or seek access to local streets or sites.

Community Zones

Community zones in the Phase 2 and Phase 1 study area include the coastal communities of Montara, Moss Beach, Princeton, El Granada, and Miramar. In communities, development is intensified with intersecting local streets, residential neighborhoods, and residences and commercial properties fronting the highway in some locations. Points of conflict increase, with cross traffic, vehicles entering and exiting the highway, and residents and visitors seeking

Highway 1 Context Zones

Above, top to bottom. *Rural Zone, looking south toward Montara State Beach; Fringe Zone, looking south toward entry to Montara; Community Zone with highway fronting businesses, looking north in Montara; Community Zone with multiple intersections, looking north in Moss Beach.*

Above, top to bottom. *Community Zone with cross streets and parallel frontage road in Moss Beach; Pedestrians cross at California Avenue to access services on the east side of the highway.*

parking. Traffic movements at major intersections may be controlled with signs or signals. Pedestrian and bicycle traffic increase, as some residents ride or walk to schools, work, services, beaches and recreation areas. Local and visiting pedestrians and bicyclists use existing trails and walk or ride along the highway shoulders (there are no sidewalks in the study area), and periodically cross the highway to reach destinations.

By contrast, urban and suburban zones occur outside the study area along Highway 1 in the Cities of Pacifica and Half Moon Bay. These areas are similar to community zones, but with greater traffic volumes and more urbanized roadway features, such as sidewalks, curbs, traffic signals, and cross walks. Slower speeds are appropriate in both community and urban/suburban zones to allow drivers time to see and react to multiple users and traffic conditions.

Suburban/Urban context zone in Half Moon Bay.

Above left and below. *Rural Zone facing south toward Half Moon Bay Airport; Community Zone in El Granada/Surfer's Beach area with many types of users.*

Traffic Speed

Site design and roadway characteristics in each of the zones influence speeds at which drivers will be comfortable, the safety and ease of street crossings for pedestrians and bicyclists, and the comfort and sense of security of those walking and bicycling along Highway 1. Roadway characteristics and land use suggest high speeds are appropriate on some segments of the corridor. However, high speeds pose challenges within context zones and locations where there is a greater need for pedestrians and bicyclists to use and cross the highway, and where there are more intersections and driveways and higher volumes of motorists entering and exiting the roadway.

Existing speed limits on the highway reinforce the corridor as a predominantly high speed facility (i.e., above 40 mph) from Pacifica to Half Moon Bay, with posted signs ranging from 45 to 55 mph. This significantly constrains the types of changes that can be considered for the highway.

"The speed limit normally should be established at the first five mile per hour increment below the 85 percentile speed [that speed at or below which 85% of the traffic is moving]. However, in matching existing conditions with the traffic safety needs of the community, engineering judgement may indicate the need for a further reduction of five miles per hour."

Caltrans Traffic Manual

State law requires an engineering and traffic survey to set speed limits below 65 mph on state highways. A survey conducted in Montara and Moss Beach by Caltrans in 2000 determined upon analysis of prevailing speeds, accident data, and roadway conditions not readily apparent to the driver that the speed limit in Montara should be reduced from 50 mph to 45 mph from a 1,000 feet north of 2nd Street in Montara to 300 feet south of 10th Street. The existing 50 mph speed limit in Moss Beach was retained.

While further speed limit reductions in Community Fringe and Community Zones would require a new survey with findings based on prevailing speeds, more recent accident data, and unexpected

conditions, strategies and tools can be considered to encourage speed moderation and safe operating behaviors within each zone.

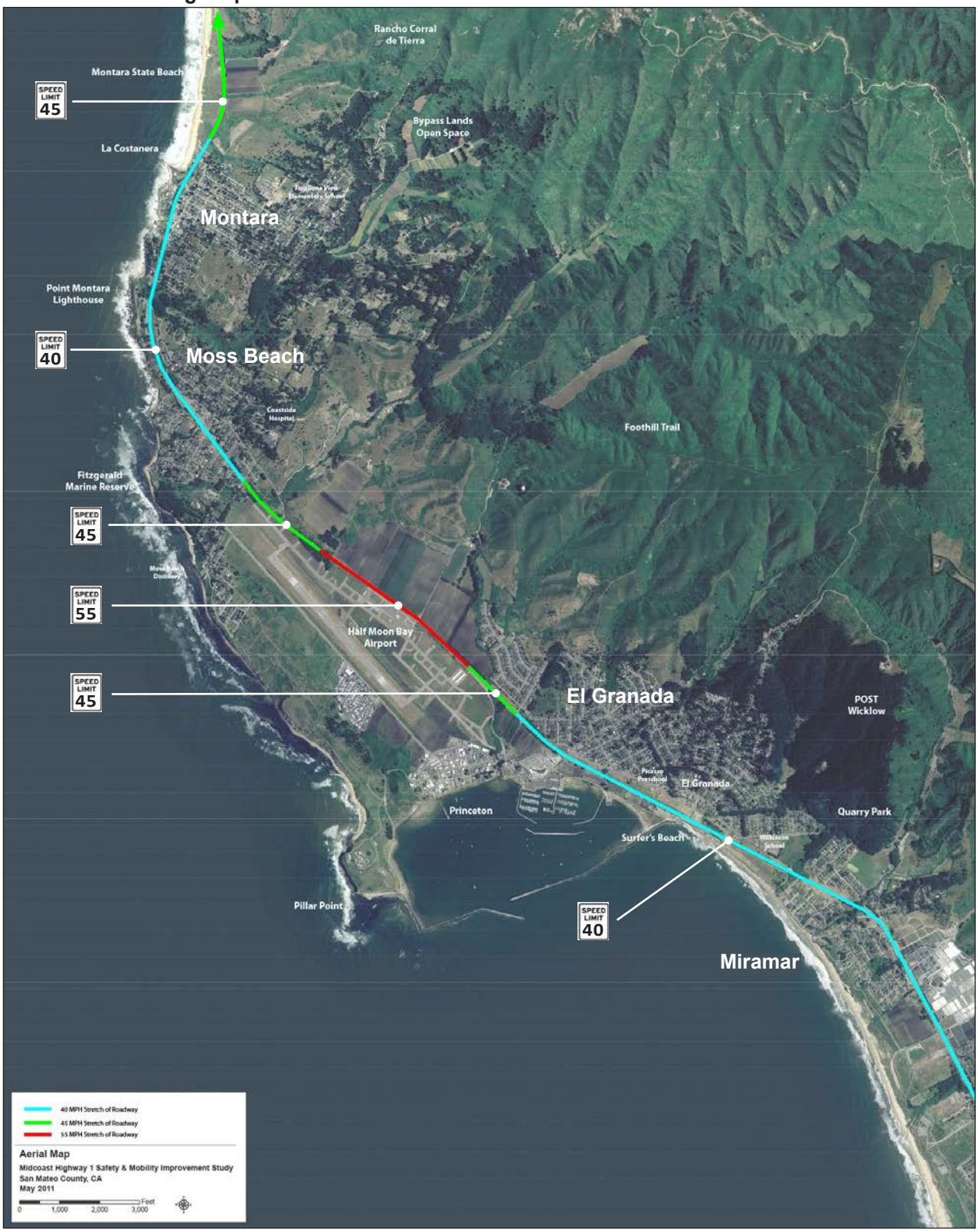
Slower speeds are appropriate in Community and Fringe areas to allow motorists and nonmotorists to see and react to multiple users and traffic conditions. The recommendations in this study for the community zones of Montara and Moss Beach, and for El Granada and Miramar in the earlier Phase 1 study, include features that will encourage slower speeds. These include medians, gateway and edge treatments, and other measures that act to highlight these areas as community zones. While California law doesn't allow speed limits to be reduced outright, when community zones are highlighted in a manner that makes them evident to drivers, motor vehicle speeds are naturally reduced to a level appropriate for a community zone.

Current posted speed limits and recommended target speeds are shown on the following pages. Reducing vehicles speeds will enable increased flexibility in the types of pedestrian and bicycle improvements that can be considered for the corridor. In a travel time analysis comparing the posted limits with the reduced speed scenario, the consultant team found the reduced speed would add about 1½ minutes in travel time between First Street in Montara and Frenchmans Creek Road in Half Moon Bay. Data regarding the impact of reduced speed on travel time is included in the Appendix.

Existing Posted Speed Limits

The image above shows the current speed zones with posted limits through the study area.

Recommended Target Speeds



The image above shows suggested targets for motor speeds through Community and Fringe zones for increased safety and flexibility in highway design and operations.

Pedestrian and Bikeway Network

Workshop and meeting participants emphasized the need to connect existing trails, add new trails for all user groups, consider trail access locations from the highway, and consider potential highway crossing locations for trail users. Completing missing links in existing trails and providing additional trails and bikeways would enable residents and visitors to make more trips on foot or by bicycle instead of in cars.

The map on the next page presents a comprehensive pedestrian and bikeway route network within the study area and surrounding communities. It includes alignments for existing routes and proposed additional alignments based on previous plans and studies, community and stakeholder input, and consultant field investigations. The map can be used to help assess the potential for increased opportunities for non-motorized travel, analyze where future increases in crossing demand might occur, and how access to trails and recreation interact with the highway.

Types of Facilities

Portions of routes within the pedestrian and bikeway network would be designed based upon physical constraints and the intended function of each route. Types of improvements include:

- Unpaved footpaths or multipurpose paths suitable for bicycling and equestrian use.
- Paved separated trails for bicycle and pedestrian use.
- Striped on-street bicycle lanes.
- Designated on-street bicycle routes with route signs, which can be combined with other bicycle and pedestrian improvements, such as pavement markings, added or enhanced sidewalks and crosswalks, and traffic calming treatments.

Bikeway planning and design in California typically relies on the guidelines and design standards established by Caltrans as documented in "Chapter 1000: Bikeway Planning and Design" of the Highway Design Manual. Caltrans standards provide for three distinct types of facilities referred to as Class I, II and III bikeways.

Class I bikeways are separated paths for exclusive bicycle and pedestrian use, with motor vehicle cross-flow minimized. Class II bikeways are striped lanes on streets and highways designated for bicycles. Class III bikeways are routes designated by signs or pavement markings for shared use with pedestrians or motor vehicle traffic. Not all shared streets are designated as bikeways, and much bicycling occurs on streets that are not designated facilities. The designation is generally reserved for facilities which provide continuity to other bicycle facilities or for preferred routes through high demand corridors.

A shared lane marking (or "sharrow") can be marked in the outside lane on a Class III route to show the suggested path of travel for bicyclists. This is often done when the route has on-street parking, in order to encourage cyclists to ride a safe distance away from the parked vehicles' "door zone." The sharrow also alerts drivers to the presence of bicycles along the route and can be used at

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Insert Pedestrian and Bikeway Route Network Map
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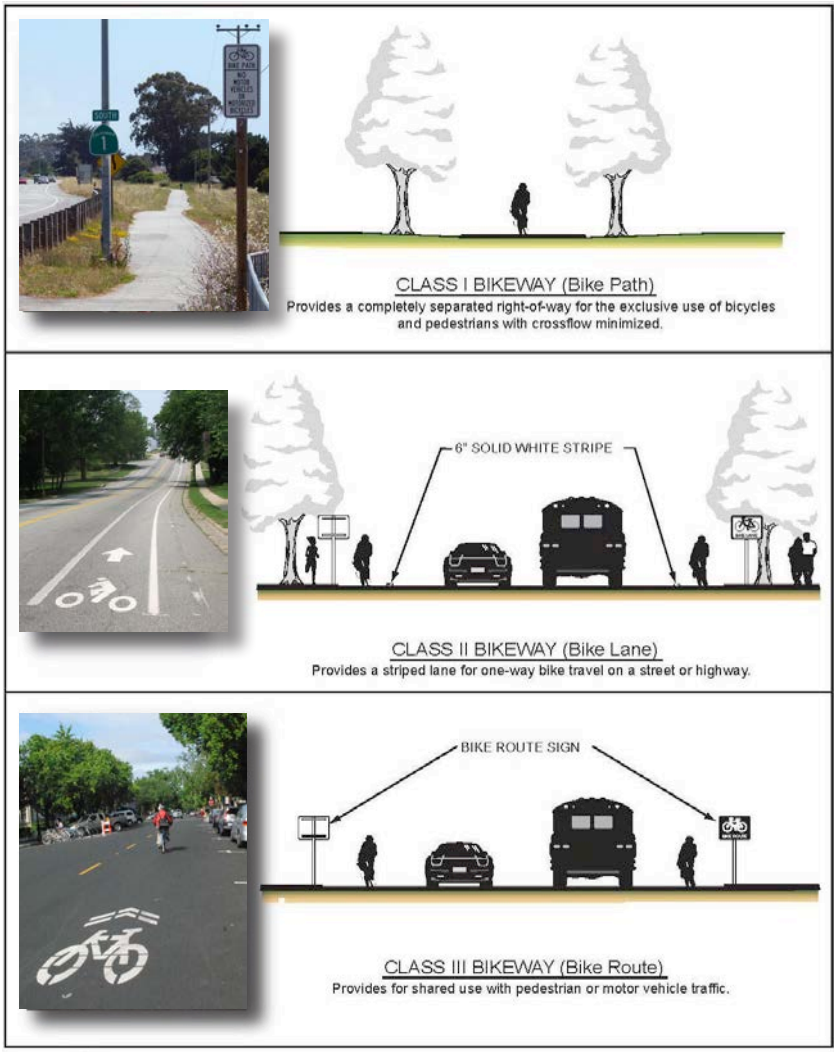


Class I, II, and III facilities are illustrated above.

Bicycle Boulevard stencil marking and sign in Berkeley are shown above.

intersections with multiple turn lanes to show bicyclists the recommended lane for through travel.

Separated paths benefit pedestrians and bicyclists by providing opportunities for off-street connections to destinations and opportunities for recreation and exercise, with little or no exposure to conflict with motor traffic. Striped on-street lanes provide space for bicycling, and can contribute to a traffic calming by adding friction to the road edge, and by narrowing the perceived width of the roadway from the vantage of the motorist. Striped lanes also provide a buffer between motor traffic and the road edge or sidewalk, improving safety and comfort for pedestrians.

Some communities have developed enhanced Class III bikeways known as Bike Boulevards. These are designated routes that are integral to a bikeway system and have low enough vehicle volumes that a bicycle lane is less necessary. In some cases, diversions or other features are necessary to reduce motor vehicle volumes, and ideally motor vehicles are slowed to approximately the same speed as the bicycle speeds. The development of a bicycle boulevard may include the alteration of intersection controls and the installation of signs and stencils. Stop signs and traffic signals on the bicycle boulevard are limited, except where they aid bicyclists in crossing busy streets. Typically, these and other modifications to enhance bicycle safety and convenience will also calm traffic and improve pedestrian safety. The City of Berkeley has implemented a number of bicycle boulevards. More information can be found at: http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=6690

Route Descriptions[1]

The pedestrian and bikeway route locations identified on the map are described in greater detail below and in the enlarged map sections on the pages that follow. Alignments are based on field rides by the consultant team, input from workshop and meeting participants, and review of past planning documents such as County studies and maps, Peninsula Open Space Trust maps, reports by the Midcoast Community Council and maps and information from the California Coastal Conservancy and California Coastal Trail.

Highway 1

Bicyclists use the highway as it provides the only direct and continuous north-south intercommunity route on the Midcoast. A minimum 6-foot wide paved shoulder should be maintained on both sides throughout the corridor that can be used by bicyclists and pedestrians that need to walk along the roadway in the absence of sidewalks. It is important to recognize that unstable terrain and steep side slopes between Devil's Slide tunnel and Montara State Beach and smaller stretches between central community areas pose significant constraints on the ability to develop continuous 6-foot or wider shoulders. But as roadway improvements such as routine maintenance, pavement overlay, or larger reconstruction projects are planned and programmed over time, providing enhanced shoulders for bicyclists should be a priority consideration.

Within fringe and community areas, additional enhancements could include striping of Class II bike lanes and/or painted shoulders to further delineate separation of the bikeway from the vehicle travel way, and to provide improved sight lines and visibility for pedestrians, bicyclists and motorists preparing to cross or enter the travel way, and space for motorists to move for passing emergency responders. These improvements could also be used to signal a change in context, increase "friction" and help narrow the perceived lane width to encourage speed reduction.

California Coastal Trail

Existing portions of the California Coastal Trail run in a north-south direction west of the highway. Future portions will need to shift to the east side in areas blocked or constrained by steep topography and shoreline proximity, and in some places join with other trail alignments to become a shared route. The trail is currently paved and separated from the highway from the City of Half Moon Bay to Pillar Point Harbor. It transitions to an on-street route through Princeton, and then to a multipurpose dirt path atop the Pillar Point bluffs to Seal Cove in Moss Beach. Planning and community discussions continue regarding the location of formal and/or agency (County, State and/or Federal) recognized alignments and types of facilities (native surface, paved, Class I, II or III) through Seal Cove northward to Devil's Slide. As discussed previously, the portion of Highway 1 bypassed by the tunnel is planned to become an official segment of the Coastal Trail.

[1] See "A Resource Guide for the Education, Promotion, Funding, and Design of Pedestrian and Bicycle Facilities: A Companion Document to the San Mateo County Comprehensive Bicycle and Pedestrian Plan," for comprehensive design guidelines for shared-use paths, bicycle lanes, bicycle routes, sidewalks, crossings and intersections, including typical cost estimates. To access the document, go to the City/County Association of Governments of San Mateo County web site: http://www.sanmateocountybikepedplan.org/index.php?cID=242

Solid blue lines on the map show the principal route alignment. Dashed blue lines on the map show potential opportunities that could serve as interim or informal alignments, or that might prove upon further study and community discussions more viable and appropriate as principal alignments.

Completed and planned portions of the trail facilitate community connection with the region's wildlife and natural beauty, and provide access to open space and recreational opportunities. The trail also provides a north-south inter-community, non-motorized travel corridor that largely avoids the highway, though portions are principally suited to recreational use and coastal access as opposed to commuter travel.

Parallel Trail

In addition to the Coastal Trail, participants at the meetings and workshops and various planning documents envision a continuous, predominantly separated trail for bicyclists and pedestrians on the east side of the highway from the City of Half Moon Bay to Montara. This would be a paved north-south route to provide a safe and convenient travel alternative for midcoast residents of all ages and abilities. Dashed green lines show potential alternative or additional route alignments, or connecting routes between the parallel trail and other trails. Certain streets could be prioritized for improvements because of their potential to provide effective bicycle and pedestrian linkages. Potential improvements could include wayfinding signage, enhanced shoulders, striped bike lanes, sidewalks, traffic calming measures, and/or separated trails where feasible.

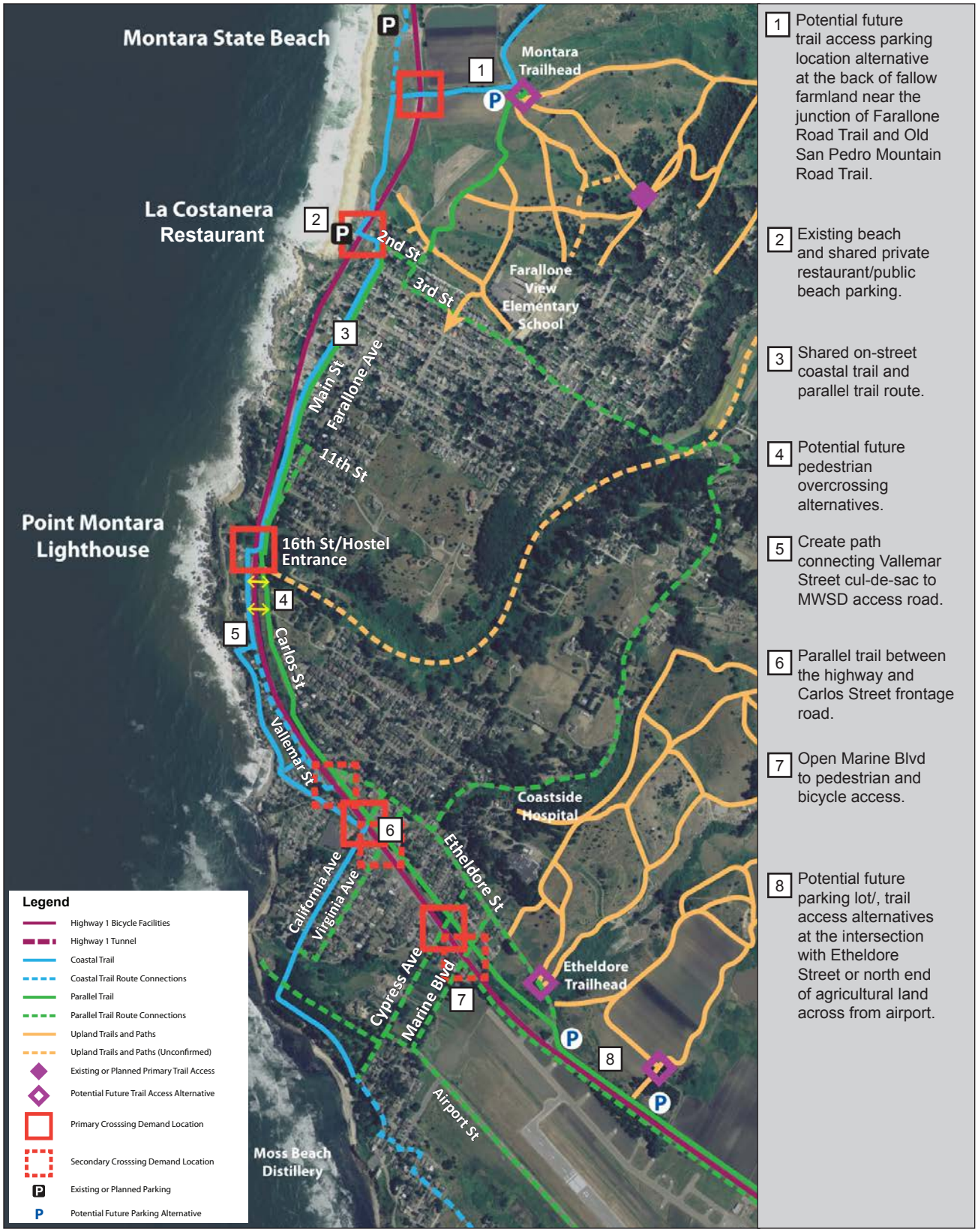
Upland Trails

Based on review of materials from past workshops, review of County, State and National parks and trails maps and plans, and input from meeting and workshop participants, the consultant team mapped the network of upland trails and informal paths that are used for recreational purposes. Portions of the network currently serve or suggest potential future opportunities for pedestrian and bicycle travel connections. The network includes access into future Golden Gate National Recreation Area lands and the Midcoast Foothill Trail. Some alignments can also provide "feeder" access from residential neighborhoods to the main line pedestrian and bicycle circulation system. The trail system would be predominantly unpaved and oriented to walking, hiking, and equestrian use, with the potential for selected portions to be open and possibly improved for bicycle use.

Pedestrian & Bicycle Network: Pacifica to Montara

1. Planned Coastal Trail segment after tunnel opening
2. Planned parking lot and trail access.
3. Existing parking lot and trail access - Gray Whale Cove.
4. Existing trail access and small parking area - McNee Ranch.
5. Existing dirt parking lot and beach access.
6. Potential future trail access parking location at the back of fallow farmland near the junction of Farallone Road Trail and Old San Pedro Mountain Road Trail.

Pedestrian & Bicycle Network: Montara to Moss Beach

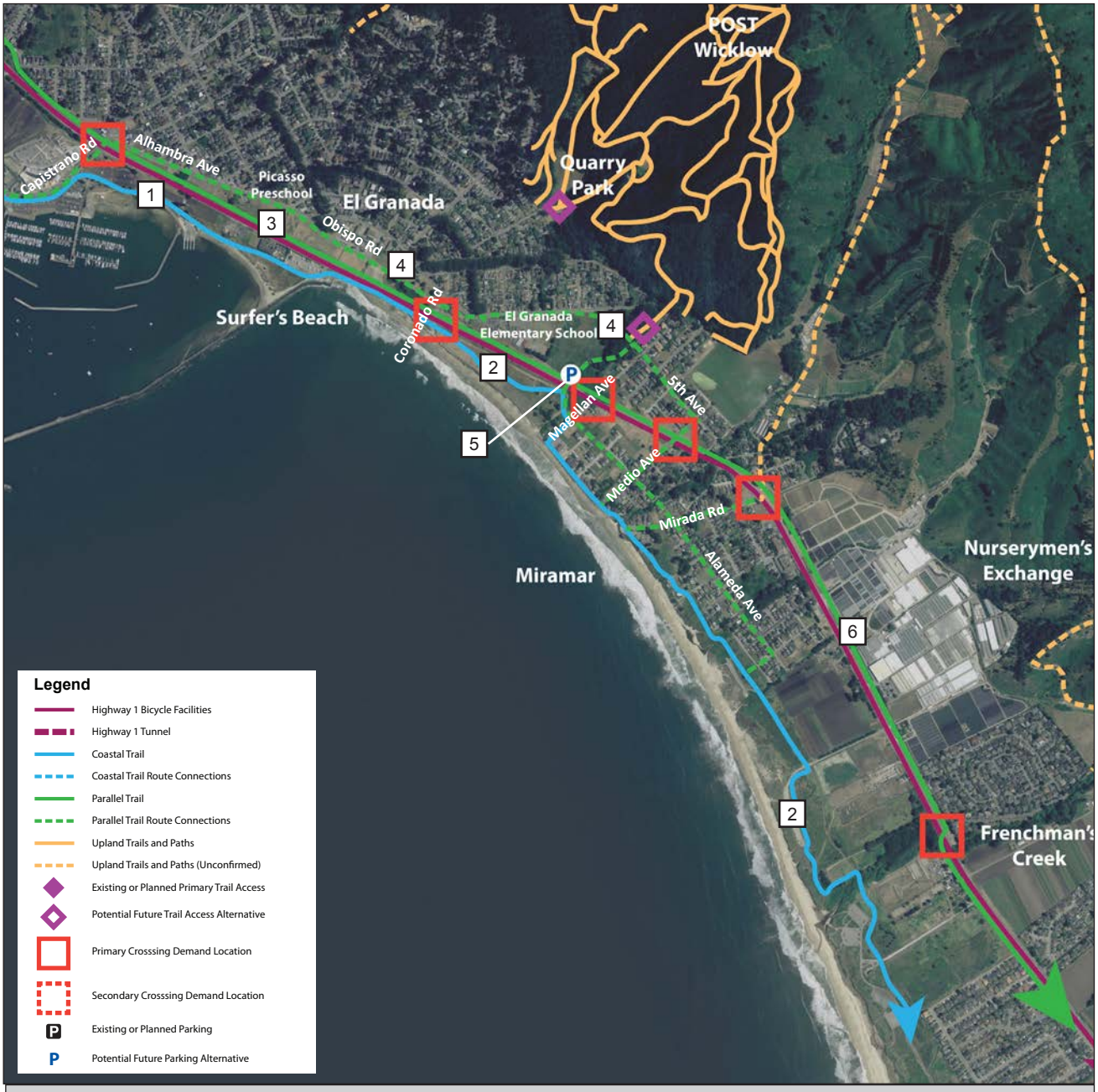


Pedestrian & Bicycle Network: Moss Beach to Pillar Point Harbor

1. On-street routes to be determined with Seal Cove resident input.
2. Existing multipurpose bluff-top dirt trail link between Pillar Point and Seal Cove.
3. Potential improved link between Moss Beach and Princeton (bike lanes and/or separated paved trail).
4. Potential future parking lot/, trail access alternatives at the intersection with Etheldore Street or north end of agricultural land across from airport.
5. Potential separated paved trail east side of the highway linking Moss Beach and El Granada.
6. Potential alternative alignment for paved trail west side of the highway in coordination with airport improvements linking Moss Beach and El Granada.*
7. Existing on-street connection through Princeton.

***Note:** The airport is owned by the County and is under FAA requirements to ensure ground separation between motor vehicles and airplanes on taxi ways. The County is in the process of developing a plan to improve airport circulation which will likely include establishment of a parallel frontage road between the highway and the hangers and taxi way. This presents a potential opportunity to establish the parallel trail in conjunction with the frontage road on the west side of the highway that would avoid conflict with agricultural land on the east side of the highway.

Pedestrian & Bicycle Network: El Granada to Half Moon Bay



1. Existing paved trail past east jetty, transitioning to dirt trail, then paved route through parking lots and on-street through Princeton.
2. Existing paved, separated trail Surfer's Beach to City of Half Moon Bay.
3. Potential alignment along "Burnham Strip."
4. Potential alignment using paths and existing streets.
5. Potential future parking lot/ trail access alternatives to Quarry Park and POST Wicklow property.
6. Planned City of Half Moon Bay trail to City/County boundary at Mirada Road.

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Focus Area Design Proposals

A series of design concepts were developed through the study process that comprise a framework of proposed improvements for the Highway 1 corridor. This framework is intended to address driver perception of changing context zones and conditions, traffic speed and access in community areas, coastal, trail and open space access from both sides of the highway, and pedestrian and bicycle needs in community areas and other high demand locations. A number of tools and strategies are introduced. These include:

- **Use of medians in community areas.** Raised medians in community centers can be used to physically restrict or channelize turning movements on and off the highway, which will facilitate orderly and predictable access to adjacent properties and local streets, improve local circulation, and encourage reduced speeds in locations where reductions are desired. Medians will also alert drivers to a change in context, which can encourage reduced speeds in community and community fringe zones where speed reductions are desirable to enhance safety of all users. Medians will also provide refuge areas for pedestrians and bicyclists crossing the highway. As Highway 1 is considered a high speed facility with posted speeds above 40 miles per hour in community areas, the introduction of raised medians may require a design exception to meet Caltrans standards and approval. Over time, medians and other treatments may reduce prevailing motor speeds in community areas, which is a precondition for reducing posted speed limits.

- **Designated pedestrian and bicycle crossing locations in high demand areas.** This will reduce the likelihood of random crossings and facilitate orderly and predictable movements where pedestrians and bicyclists need to cross the highway.

- **Consideration of roundabouts in community areas.** Roundabouts in community areas would offer numerous safety and circulation benefits, including significant reduction in traffic speeds in locations where reductions are desired, reduced conflicts between vehicles entering and exiting the highway, and safe crossing locations for pedestrians and bicyclists. They also provide an alternative to signalized intersections, should future traffic raise the need for controls. Under current conditions drivers sometimes experience significant delay when trying to enter the side streets from the busiest cross streets like 8th Street in Montara as well as California Avenue and Cypress Avenue in Moss Beach. As a result, drivers sometimes make risky turning movements onto the highway. Roundabouts would provide for easy turning movements onto the highway, in a safer manner than traffic signals. Roundabouts result in a minor amount of delay to all highway traffic, resulting from the speed reduction in the design, but would have significantly less delay than traffic signals when managing cross-street traffic during peak hours.

- **Pedestrian and bicycle improvements on parallel roads in community centers.** Parallel streets in Montara and Moss Beach offer opportunities for enhanced walkable environments off the highway that are visible and easily accessible from the highway where there are concentrations of small businesses and services.

- **Parking configurations for beach and trail access.** Strategies for locating and organizing parking will maintain access to recreation and reduce the impacts on highway safety and circulation and residential neighborhoods associated with haphazard or illegal parking.

Median in Sutter Creek serves as a traffic calming entry feature into the town center.

Median on Highway 1 in Half Moon Bay is designed with low maintenance, drought-tolerant landscaping. High contrast materials increase visibility to motorists.

Same median with wayfinding signs. Medians can also be designed with decorative pavement and public art.

Pedestrian warning sign on Highway 1 in Miramar.

Medians

Constructing raised medians in targeted locations in community areas can improve highway safety and operations in several ways. Medians can control cross traffic, restrict u-turns and direct vehicles entering and exiting the highway to a few locations, reducing points of conflict associated with sporadic turning movements while facilitating consistent traffic flow. Turning bays provide spaces where left turning vehicles can vacate the travel way and safely wait for a gap in oncoming traffic, enabling through traffic to continue.

Pedestrian Crossings

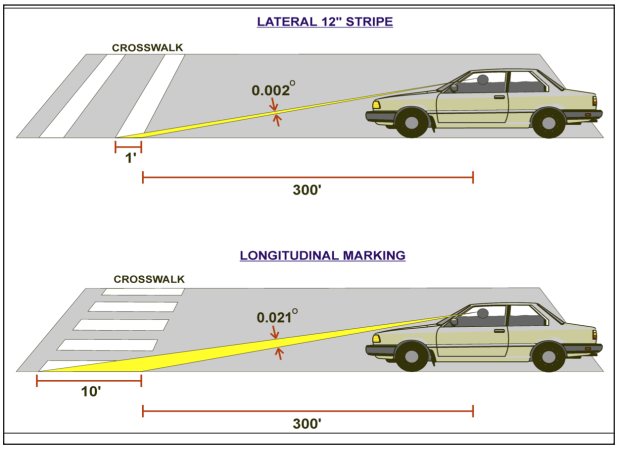
Pedestrians are permitted by state law to cross the highway throughout the study area unless there is a sign prohibiting crossings. Since pedestrians cross at numerous locations in community areas, medians would have the added benefit of providing a refuge area for pedestrians, so they only have to gauge gaps in traffic in one direction and cross one lane of travel at a time.

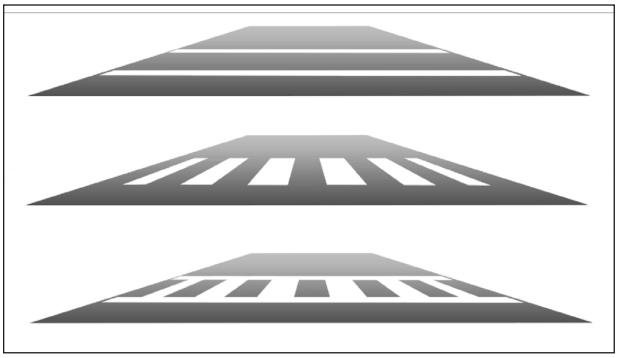
As will be seen, designated crossing locations are proposed in Montara and Moss Beach, and locations north of Montara where proposed trails must shift from one side of the highway to the other or a parking area requires pedestrians to cross the highway to reach a destination. Other potential crossings identified in the Phase 1 study are shown in the El Granada/Surfer's Beach alternatives later in this report. Proposed measures at these locations include advance pedestrian warning signs and marked crosswalks with signs outfitted with pedestrian-activated rectangular rapid flash beacons (RRBF). In community areas these treatments are proposed in conjunction with raised medians channelized to serve as pedestrian crossing islands.

Where can pedestrians legally cross Highway 1?

Under California law, a crosswalk exists at every intersection, whether or not it is marked, unless there is a sign prohibiting crossings at that location. Crosswalks exist between intersections only when they are marked. State law requires drivers to yield to pedestrians at marked or unmarked crosswalks. Pedestrians cannot step into the path of a vehicle that is so close there is an immediate hazard. Pedestrians may cross where there are no crosswalks (except between adjacent intersections controlled by signals or officers) but they must yield to drivers. Pedestrians crossing at signals must enter the crosswalk before the flashing hand is displayed.

High Visibility Crosswalks





Crosswalk striping patterns with lines logitudinal to the rodaway are more visible to approaching motorists than the two transverse lines used on many crosswalks. High visibility patterns are especially beneficial at uncontrolled crossing locations (i.e., where there are no stops signs or traffic signals requiring vehicles to stop).

Pedestrian Refuge Island

Median refuge island in West Sacramento.

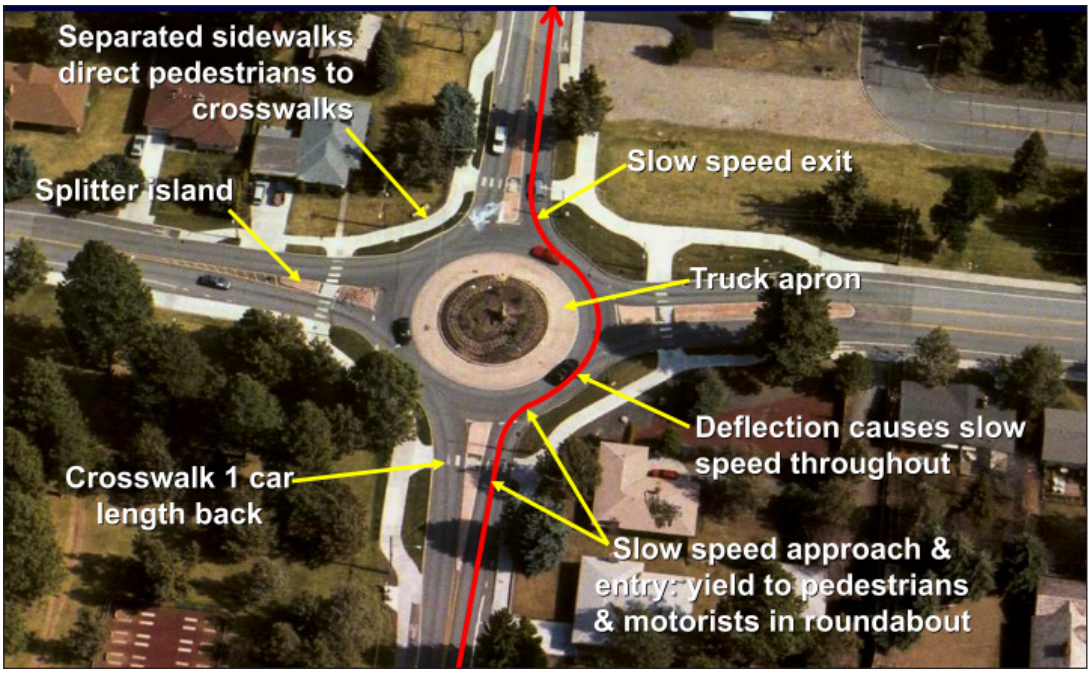
Warning and Crosswalk Signs

Pedestrian warning signs are needed on Highway 1 to alert motorists they are approaching locations where pedestrian crossing activity is unexpected or not readily apparent. Pedestrian crossing signs at crosswalks require a downward arrow beneath the sign pointing to the marked crosswalk. Flashing amber lights can be added to signs to increase visibility.

Rectangular Rapid Flash Beacon

Pedestrian activated flashing beacons can be installed at crosswalks to increase the number of drivers yielding for pedestrians and reduce pedestrian-vehicle conflicts. New rectangular rapid flash beacons (RRFB) with rapid flashing LED lamps as pictured above should be considered in place of traditional slow flashing incandescent lamps. Initial studies suggest the stutter flash is very effective as measured by increased driver yielding behavior. Caltrans recently received Federal Highway Administration approval for use of RRFBs on crosswalk signs.

Roundabouts



Roundabouts use a raised circular island to allow traffic to pass counterclockwise through an intersection at low speed without the use of stop signs or signals. Though roundabouts are becoming more common in California, community members may raise concerns when they are first proposed. However, once built, residents often recognize that they are safer, quieter and more attractive than conventional intersections. Traffic engineers are recognizing that roundabouts are safer and often more efficient than a stop-controlled or signalized intersection.

- A typical 4-way intersection has 32 vehicle-to-vehicle conflicts and 24 vehicle-to-pedestrian conflicts. At a roundabout both types of conflicts are reduced to 8.
- Roundabouts are designed to bring vehicle speeds down to 15-25 mph, speeds at which motorists are much more likely to yield to pedestrians and the frequency and severity of accidents are greatly diminished.
- Roundabouts are designed with a splitter island that provides a refuge for pedestrians as they cross the street and simplifies the crossing by letting them focus on vehicles traveling in only one direction.
- Bicyclists can take the travel lane since vehicles are circulating at a comfortable bicycle speed. A ramp can be provided on the approach to the roundabout so that less confident bicyclists can choose to exit and use the sidewalk to walk their bicycle to the crosswalk.
- Roundabouts can be designed to accommodate the largest trucks with a mountable truck apron to allow space for wheels or equipment to pass over for turning movements.

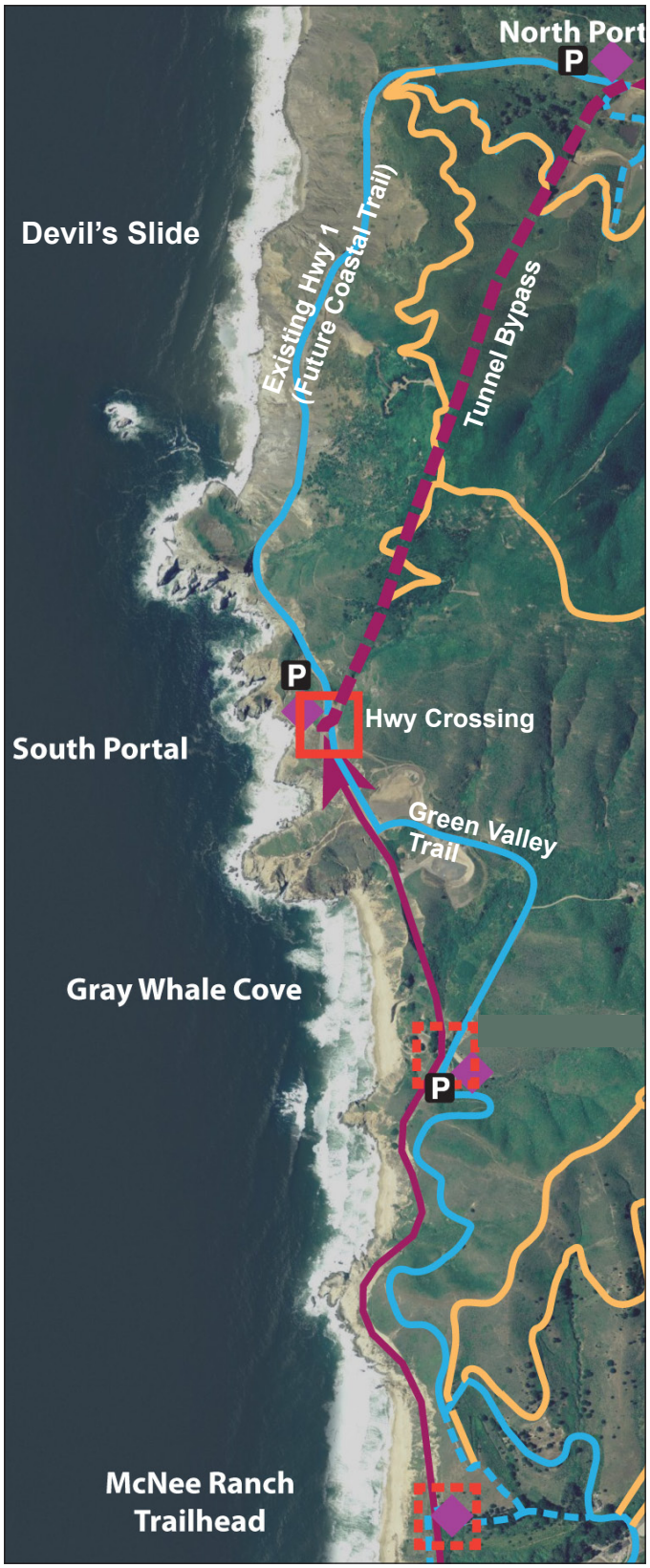
Roundabouts can increase intersection capacity by up to 30 percent and reduce delay, reduce the need for storage lanes, and improve traffic flow at intersections with frequent left turns. Roundabouts save signal maintenance and energy costs and have a longer service life than signal equipment. More information about roundabouts is included in the Appendix.

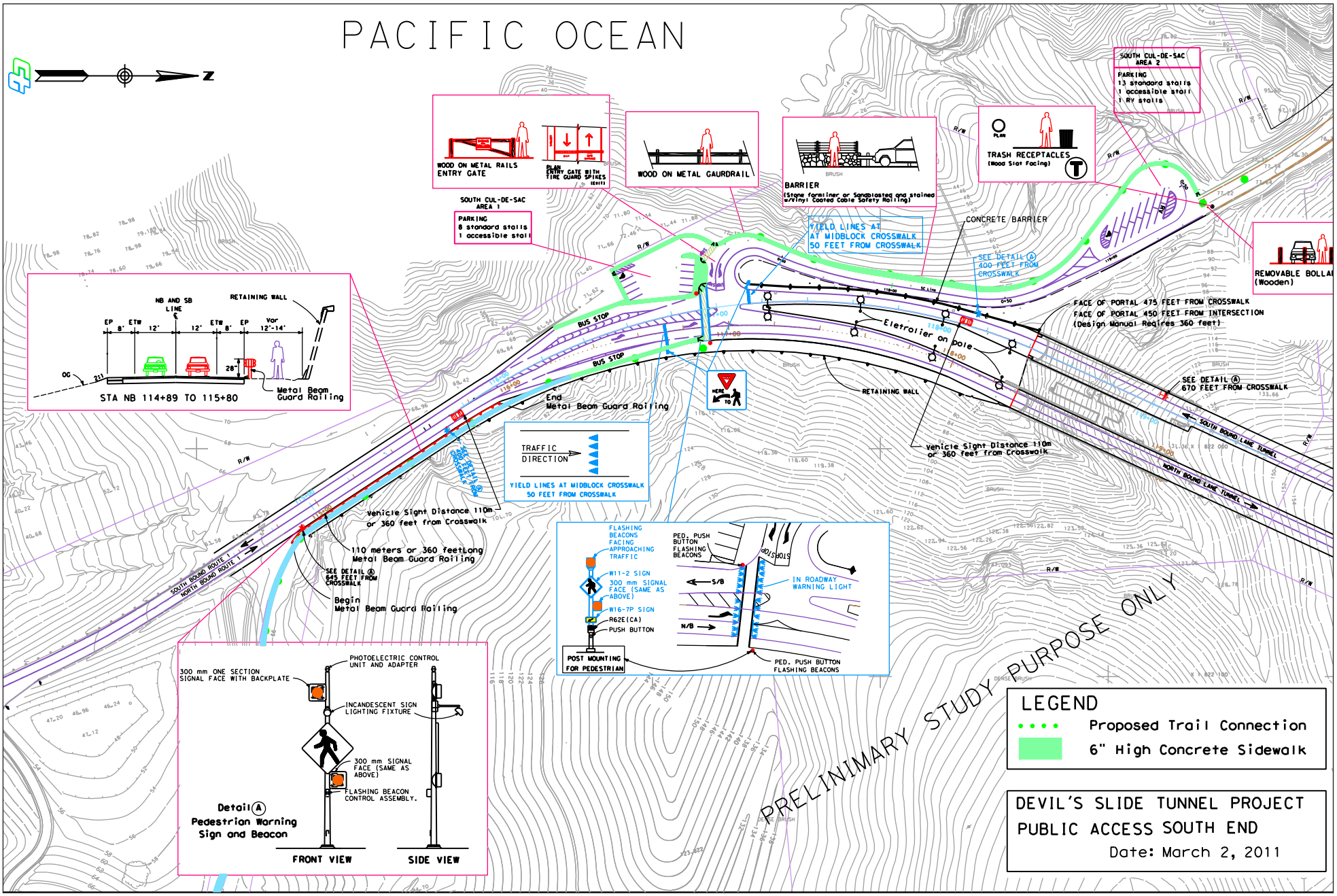
Devil's Slide

As noted previously, a bridge and tunnel will soon open that bypass the Devil's Slide area where Highway 1 has a history of landslide closures. The bypassed roadway will be relinquished to the County with plans for conversion to a public scenic area and trail. The trail is planned to become part of the California Coastal Trail and will terminate at the south end of the tunnel due to lack of space between the highway and steep cliffs. An unpaved path known as the Green Valley Trail provides an opportunity for trail continuation east of the highway, but will create the need for users to cross the roadway.

Members of the public and participants in the study process expressed concerns regarding the safety of pedestrians crossing the highway south of the tunnel. As shown on the draft design on the next page, Caltrans has proposed plans for an at-grade crossing south of the tunnel that includes advanced pedestrian warning signs with flashing lights, a marked crosswalk with pedestrian actuated in-pavement flashers and flashing lights on signs at the crosswalk, and advance yield lines set back from the crosswalk for waiting motorists.

Placing a crosswalk at the south end of the Devil's slide tunnel is challenging, primarily due to the curvature of the roadway. In the draft design prepared by Caltrans, there is sufficient stopping sight distance for motorists traveling the posted speed to see pedestrians using this crosswalk. However, drivers exceeding the speed limit might not be able see pedestrians in time. The proposed pedestrian push button flashing beacons mitigate for this by letting drivers know when pedestrians are using the crosswalk, and encouraging them to slow down. Caltrans recently received Federal Highway Administration approval for use of rectangular rapid flash beacons (RRFB) on crosswalk signs, which use rapid flashing LED lamps instead of traditional slow




PACIFIC OCEAN
N
WOOD ON METAL RAILS ENTRY GATE
PLAN ENTRY GATE WITH TIRE GUARD SPIKES
WOOD ON METAL GAURDRAIL
BARRIER
(Stone formliner or Sandblasted and stained w/Vinyl Coated Cable Safety Railing)
TRASH RECEPTACLES
(Wood Slat Facing)
SOUTH CUL-DE-SAC AREA 2
PARKING
13 standard stalls
1 accessible stall
1 RV stalls
SOUTH CUL-DE-SAC AREA 1
PARKING
8 standard stalls
1 accessible stall
YIELD LINES AT MIDBLOCK CROSSWALK 50 FEET FROM CROSSWALK
CONCRETE BARRIER
SEE DETAIL A 400 FEET FROM CROSSWALK
REMOVABLE BOLLA
(Wooden)
FACE OF PORTAL 475 FEET FROM CROSSWALK
FACE OF PORTAL 450 FEET FROM INTERSECTION
(Design Manual Reqires 360 feet)
NB AND SB LINE
RETAINING WALL
EP 8' ETW 12' 12' ETW 8' EP Var 12'-14'
2:1
28"
OG
STA NB 114+89 TO 115+80
Metal Beam Guard Railing
BUS STOP
BUS STOP
End Metal Beam Guard Railing
Eletrolier on pole
RETAINING WALL
SEE DETAIL A 670 FEET FROM CROSSWALK
SOUTH BOUND LANE TUNNEL
NORTH BOUND LANE TUNNEL
Vehicle Sight Distance 110m or 360 feet from Crosswalk
TRAFFIC DIRECTION
YIELD LINES AT MIDBLOCK CROSSWALK 50 FEET FROM CROSSWALK
Vehicle Sight Distance 110m or 360 feet from Crosswalk
110 meters or 360 feetLong Metal Beam Guard Railing
SEE DETAIL A 645 FEET FROM CROSSWALK
Begin Metal Beam Guard Railing
SOUTH BOUND ROUTE 1
NORTH BOUND ROUTE 1
FLASHING BEACONS FACING APPROACHING TRAFFIC
W11-2 SIGN
300 mm SIGNAL FACE (SAME AS ABOVE)
W16-7P SIGN
R62E(CA)
PUSH BUTTON
POST MOUNTING FOR PEDESTRIAN
PED. PUSH BUTTON FLASHING BEACONS
STOP/SLOW
IN ROADWAY WARNING LIGHT
S/B
N/B
PED. PUSH BUTTON FLASHING BEACONS
300 mm ONE SECTION SIGNAL FACE WITH BACKPLATE
PHOTOELECTRIC CONTROL UNIT AND ADAPTER
INCANDESCENT SIGN LIGHTING FIXTURE
300 mm SIGNAL FACE (SAME AS ABOVE)
FLASHING BEACON CONTROL ASSEMBLY.
Detail A
Pedestrian Warning Sign and Beacon
FRONT VIEW
SIDE VIEW
PRELIMINARY STUDY PURPOSE ONLY
LEGEND
Proposed Trail Connection
6" High Concrete Sidewalk
DEVIL'S SLIDE TUNNEL PROJECT
PUBLIC ACCESS SOUTH END
Date: March 2, 2011

flashing incandescent lamps. Initial studies suggest the stutter flash is effective as measured by increased driver yielding behavior and should be installed on the crosswalk signs for increased effectiveness.

Another consideration is the sight distance for pedestrians as well as for motorists. Many pedestrians crossing the highway will assume that drivers may not yield to them, and therefore will want to be able to ensure that there is a gap sufficient to cross, even if motorists don't slow down or yield. There is not enough sight distance for pedestrians to be able to scan the highway in both directions and find a gap sufficient to cross the entire roadway. However, there is enough sight distance for pedestrians to identify a gap large enough to cross to the striped median, and then assess another gap to cross the second half of the roadway. This will help pedestrians cross the roadway, though they may have to wait in the striped median for an appropriate gap between drivers that fail to yield.

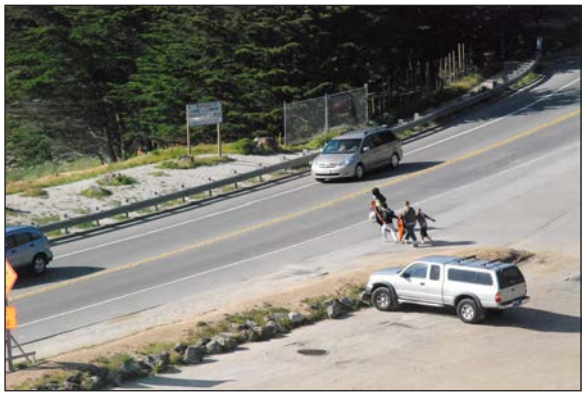
It would theoretically be possible to move the crossing further south, to approximately the location where the Green Valley Trail is proposed to connect to the highway. However, to do this, a walkway would need to be built on the west side of the highway from this new crossing location to the parking lot. There is currently no room in this area to build a walkway, and there are some areas with significant fill slopes or retaining walls that would need to be reconstructed. Initially, it seems like the highway could be moved to the east, allowing for a walkway on the west side. However, this would place northbound traffic too close to the retaining wall holding back the slope on the east side, resulting in substandard stopping sight distance for northbound traffic.

A grade separated crossing would be a costly, but potential long-term solution.[1] Caltrans has expressed reservations regarding an undercrossing due to security and safety issues associated with users out of sight below ground. An overcrossing could be a future possiblity, though approaches of several hundred feet or more would be required to reach the necessary elevation for roadway clearance and maintain the maximum 5% allowable slope per ADA requirements, which could result in real or perceived out of direction travel for users. In addition, substantial fill and retaining construction would still be required to support a structure and walkway on the west side of the highway.

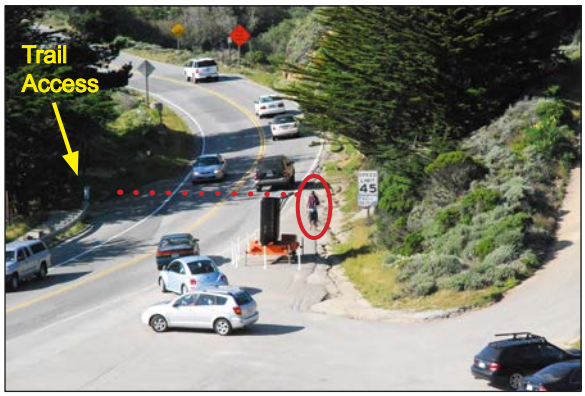
Beyond the above observations and considerations, the consultant team has no new findings to report indicating the at-grade crossing as proposed is unsafe or inadequate.

[1] Typical costs for grade-separated crossings range from $2M to $8M, according to the document, "A Resource Guide for the Education, Promotion, Funding, and Design of Pedestrian and Bicycle Facilities A Companion Document to the San Mateo County Comprehensive Bicycle and Pedestrian Plan," August, 2011.

Gray Whale Cove parking lot looking northward from the Gray Whale Cover trail.



Pedestrians run from the parking lot entrance to access the beach trail on the west side of the highway. The beach trail entrance is located about 225 feet north of the parking lot entrance.



A pedestrian walks along the road to the parking lot after crossing from the beach trail west of the highway.

Gray Whale Cove

Gray Whale Cove is surrounded by steep cliffs west of the highway, with a small picnic area and trail that leads down to the beach. Substantial automobile parking is available on the east side of the highway, but there is inadequate space for parking on the west side. The lot provides access to the beach trail and the Green Valley and Gray Whale Cove trails that traverse the hills on the east side of the highway.

Pedestrian crossings between the ocean side of the highway and the parking lot can be both difficult and dangerous. In addition, southbound vehicles seeking to enter the parking lot have to decelerate or stop in the travel way before making a left turn, and vehicles exiting left out of the lot have to find gaps in traffic in both directions.

Suggested improvements shown on the next page include the installation of left turn lanes and a marked crosswalk across from the beach trail entrance north of the guardrail on the west side of the highway. The design of the parking lot, the road, and beach access indicates to pedestrians to cross at the location where the trail leads down to the beach. There is also a stairway leading down to this location from the overflow parking lot.

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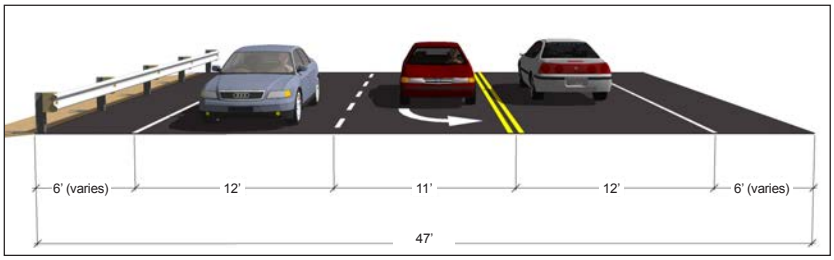
Proposed Improvements

- Install left turn bay with painted island to provide a storage area for left turn movements in and out of parking lot. The concept shown includes roadway horizontal alignment consistent with existing curves in this area and can be constructed with very little necessary earthwork. Without extending the widening through areas that require signifianctly more earthwork, standard Caltrans left turn deceleration lengths cannot be achieved. However, a retrofit with the shorter deceleration length shown here provides significant safety benefits over the existing condition with no left turn lane.
- Mark crosswalk using left turn lane taper lines as painted refuge area.
- Include pedestrian crossing warning signs at the crosswalk and in advance of the crosswalk supplemented with pedestrian activated flashing beacons at the crosswalk.
- Include signage and consider improvements to the landscaped berm between the highway and the parking lot, increasing separation and directing pedestrians to the crosswalk.
- Consider tightening the parking lot entrance and marking a crosswalk across the entrance.

Gray Whale Cove Parking Lot

Improvements are shown above to help vehicles enter and exit the parking lot, reduce conflicts between turning vehicles and through traffic, and help pedestrians cross the highway.



Right. *Highway 1 facing north just past the end of the left turn lane shown in the concept above. The road is widened at this particular location to accommodate a left turn lane.*

Montara State Beach

Highway 1, looking south toward Montara from the north end of Montara State Beach

South of Gray Whale Cove, Highway 1 passes Montara State Beach, which extends about eight-tenths of a mile between hilly terrain to the north and the community of Montara to the south. Parking areas are located on the west side of the highway toward the north end of the beach and at the south end of the beach, with public and shared public and private lots opposite 1st and 2nd Streets in Montara. There are several beach access points from the bluff area via stairs and dirt trails. A small parking lot and gate to trails in McNee Ranch State Park is located on the east side of the highway at the northern end of the beach.

The National Park Service recently assumed management of the approximately 4,000 acre Rancho Corral de Tierra parcel as part of the Golden Gate National Recreation Area (GGNRA). It includes a large expanse of land south of McNee Ranch and east of the highway, with hiking, biking and equestrian trails. Visitation and use may increase as trails, trailheads, connections and facilities are improved. This could lead to increased demand for parking and an increase in pedestrian and bicycling activity, with potential impacts on highway safety and operation. Strategies and improvements are shown on the following pages for organizing parking and access to trails and recreation in Montara State Beach and Rancho Corral de Tierra as the area continues to evolve as a regional amenity.

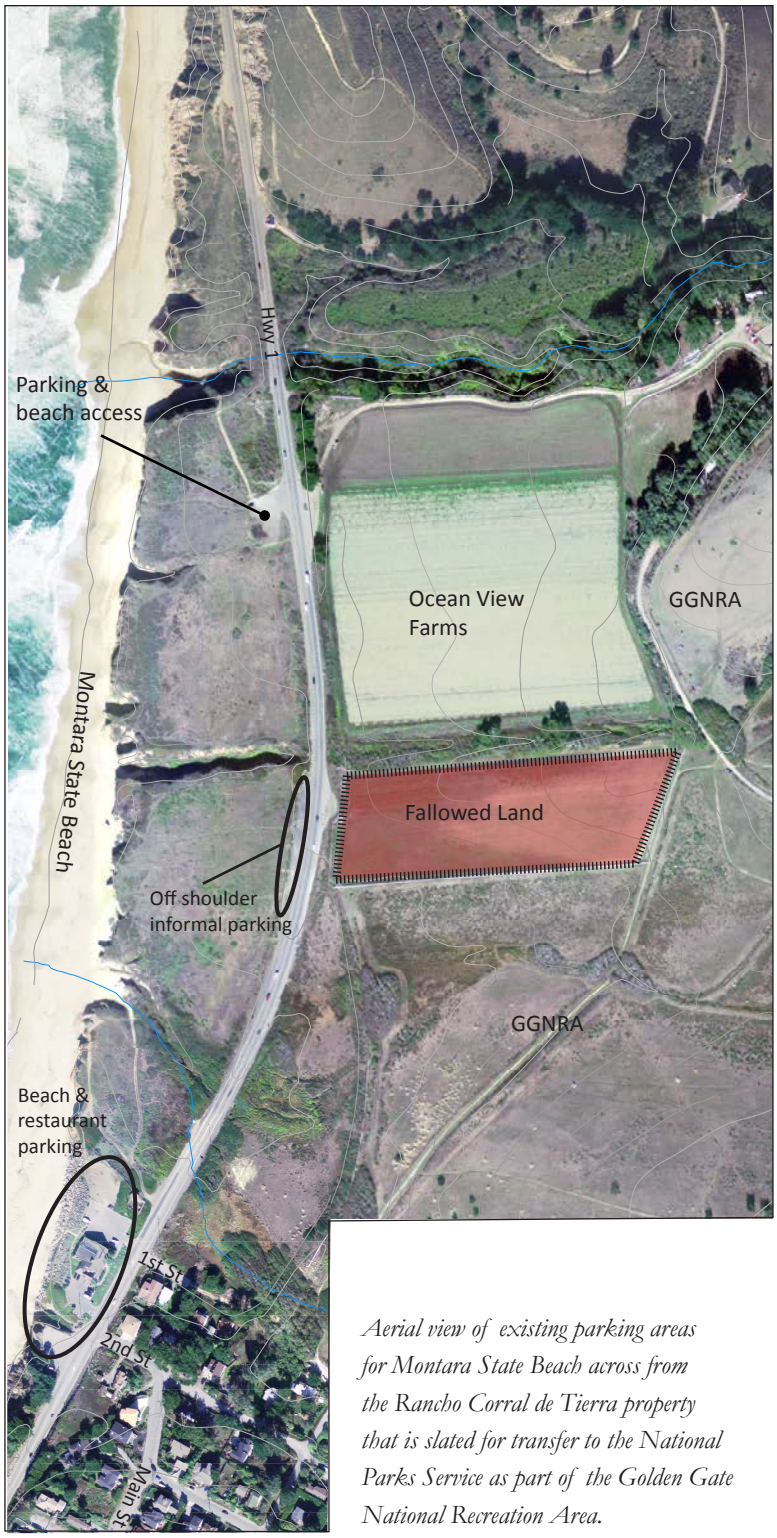
Montara State Beach/Rancho Corral de Tierra Interface

Workshop participants noted a number of challenges associated with access and parking at the conjunction of Montara State Beach, Rancho Corral de Tierra, and the community of Montara. These include:

- Balancing the needs of beach, trail, and restaurant users.
- Addressing peak use on weekends.
- Minimal "No Parking" signage or enforcement.
- Crossing safety.
- Lack of wayfinding information.

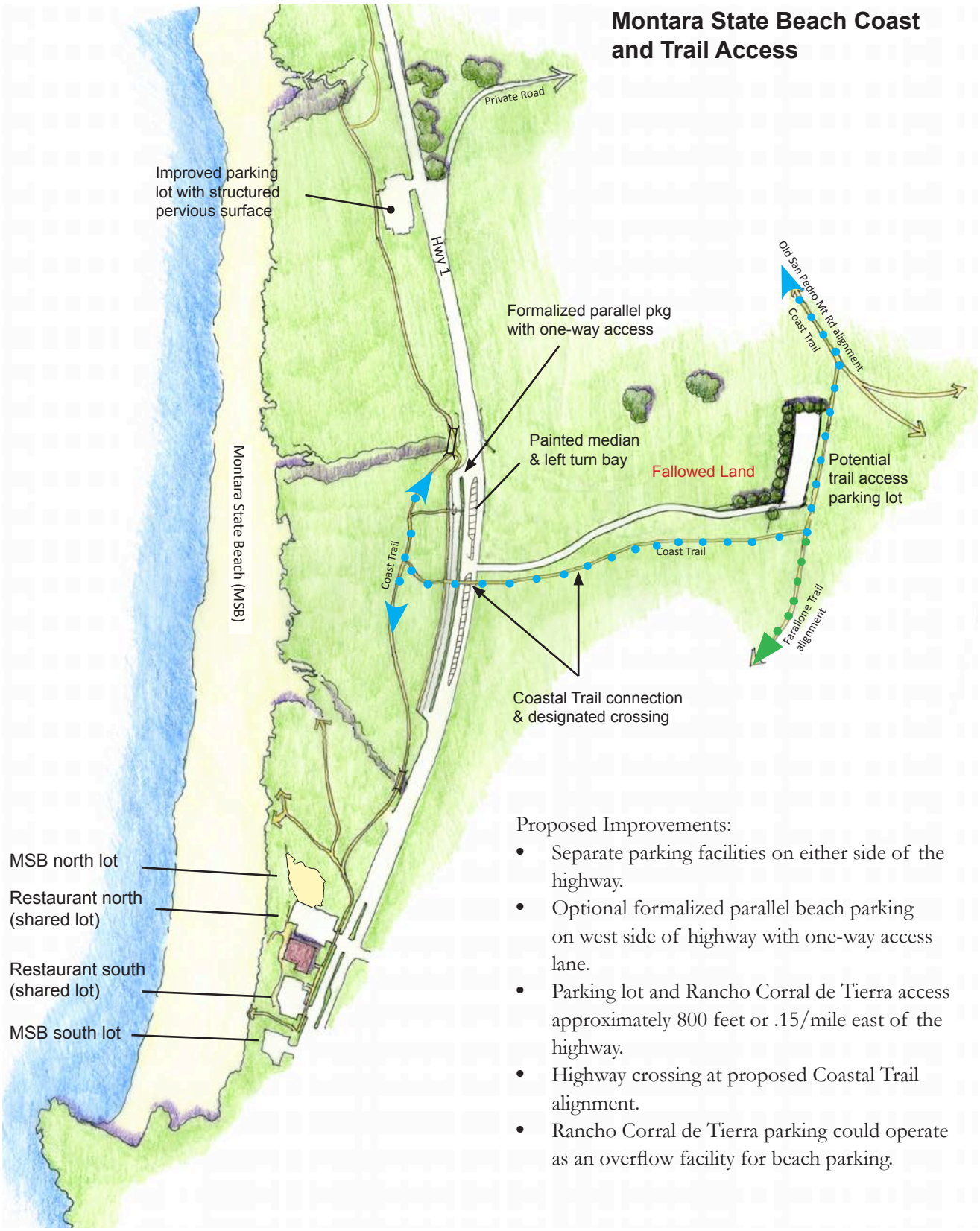
Currently, there is a dirt parking lot opposite Ocean View Farms on the west side of the highway with a path to the beach. About four-tenths of mile to the south, at the northern edge of the community of Montara, there are two public parking lots and two restaurant-owned parking lots that are open to public use during the daytime at the south end of Montara Beach. In addition, motorists park informally in an unmarked area on the west side of the highway and illegally on both sides of the highway during peak periods in sign-restricted areas. Parking and wayfinding issues may intensify as more users seek access to Rancoho Corral de Tierra trails and open space east of the highway that recently became part of the Golden Gate National Recreation Area.

The consultant team explored several options to address parking needs, circulation, and beach and trail access. A concept is shown on the next page that would make use of existing formal and informal parking and create a prominent access point to GGNRA park land.



Aerial view of existing parking areas for Montara State Beach across from the Rancho Corral de Tierra property that is slated for transfer to the National Parks Service as part of the Golden Gate National Recreation Area.

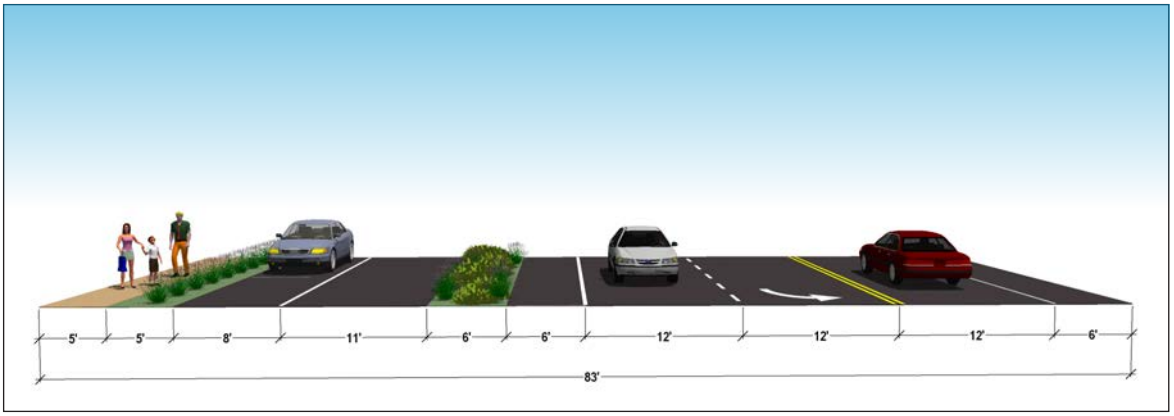
Montara State Beach Coast and Trail Access



Proposed Improvements:

- Separate parking facilities on either side of the highway.
- Optional formalized parallel beach parking on west side of highway with one-way access lane.
- Parking lot and Rancho Corral de Tierra access approximately 800 feet or .15/mile east of the highway.
- Highway crossing at proposed Coastal Trail alignment.
- Rancho Corral de Tierra parking could operate as an overflow facility for beach parking.

Highway 1 with Oceanside Parallel Parking



The cross section above shows Highway 1 facing north, just north of the driveway for the GGNRA parking lot shown in the plan on the previous page. The existing paved width is about 32 feet. Widening would be necessary to put in the left turn lane. This illustration also shows the paved parallel parking area on the west side of the highway, which would require new construction as well..

GGNRA access with parking would be placed east of the highway at the junction of Old San Pedro Mountain Road and existing paths that present opportunities for trail improvements. This would provide a park entry point recognizabe and accessed from the highway, located to reduce GGNRA visitation impacts on residential neighborhoods in Montara. In addition, the Coastal Trail will need to transition from the west side to the east side of the highway in Montara State Beach. The concept illustrates how crossing demand might be oriented and consolidated to a single location in coordination with a painted or raised median to facilitate safe turning movements entering and exiting the highway.

Parking areas would be designed with low impact techniques for drainage and appearance in accord with the San Mateo County Sustainable Green Streets and Parking Lots Design Guidebook. Green streets and green parking lots are designed to minimize disturbance and reflect and mimic drainage patterns of the natural landscape. For more information, go to: www.flowstobay.org/ms_sustainable_streets.php

As shown in the first table on the following page, there is currently an estimated total of 163 parking spaces based on an analysis of the combined space available in the four parking lots opposite 1st and 2nd streets, and the shoulder area on the west side of the highway that is not restricted with no-parking signs.

By contrast, with a formalized area of parallel parking and access lane on the west side of the highway, combined with an off-street lot approximately 1,000 feet east of the highway, would yield up to 195 spaces as summarized in the second table. The new surface lot east of the highway would primarily serve visitors to GGNRA, State and County parkland, but could also serve overflow parking on high beach use days. If future beach demand requires, the parking supply could be increased on the west side of the highway by expanding the north dirt parking lot adjacent to the paved restaurant parking lot.

Existing Parking Supply: Montara Beach

Beach Parking	Spaces	Status
Montara State Beach - North Lot	37	Unpaved
Montara State Beach - South Lot	22	Paved
Restaurant North Lot	27	Paved (publicly available until 5:00 PM)
Restaurant South Lot	18	Paved (publicly available until 5:00 PM)
Subtotal: Legal Spaces	104	
Informal Parking[1]	59	Unpaved shoulder west side of highway
Total Spaces	**163**	

[1]Estimate does not include parking off shoulder in areas restricted with no parking signs.

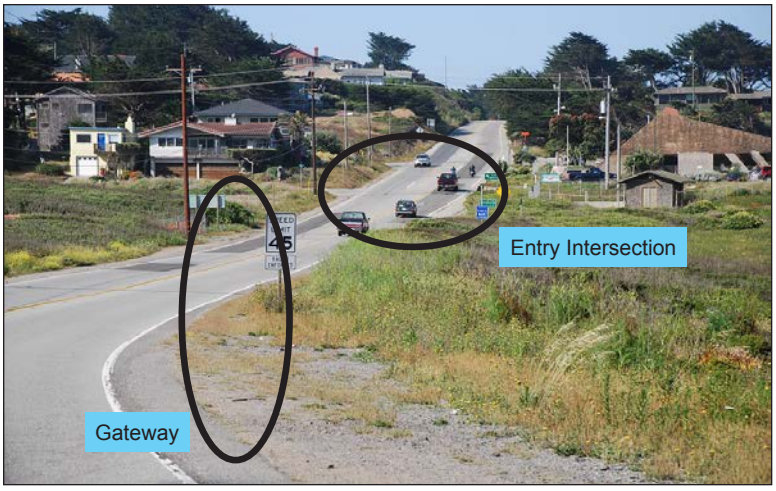
Proposed Parking Supply: Montara Beach

Beach Parking	Spaces	Status
Montara State Beach - North Lot[1]	37	Unpaved
Montara State Beach - South Lot	22	Paved
Restaurant North Lot	27	Paved (publicly available until 5:00 PM)
Restaurant South Lot	18	Paved (publicly available until 5:00 PM)
Formalized Parallel Parking[2]	31	Currently unpaved, west side of hwy
Subtotal	**135**	

GGNRA Parking		
New Off-Street Surface Lot	60	Fallow field 1/4 mile east of highway
Subtotal: Spaces for Trail Access	**60**	
Total Spaces	**195**	

[1]Consider formalization and expansion of lot if surveys show that utilization at all 3 paved facilities regularly exceeds 90% occupancy AND if illegal on-street parking remains prevalent. [2]Formalize dirt shoulder parking area west side of the hwy as parallel parking, with barrier separation from the hwy and one lane, one-way SB access lane extending approximately 600' from a one-way entrance on the north end to a one-way exit on the south end.

Montara



Highway 1, southbound, approaching Montara and the intersection with 1st Street. The circles indicate opportunities for a gateway treatment at the community fringe and intersection enhancements at the community entry to facilitate awareness of changing conditions.

Southbound travelers enter the community of Montara at 1st Street and encounter a significant activity area that includes beach goers and restaurant patrons. The next intersection, 2nd Street, provides primary access to the community from the north, including to Main Street, residential neighborhoods, and 3rd Street, which leads to Farallone Elementary School.

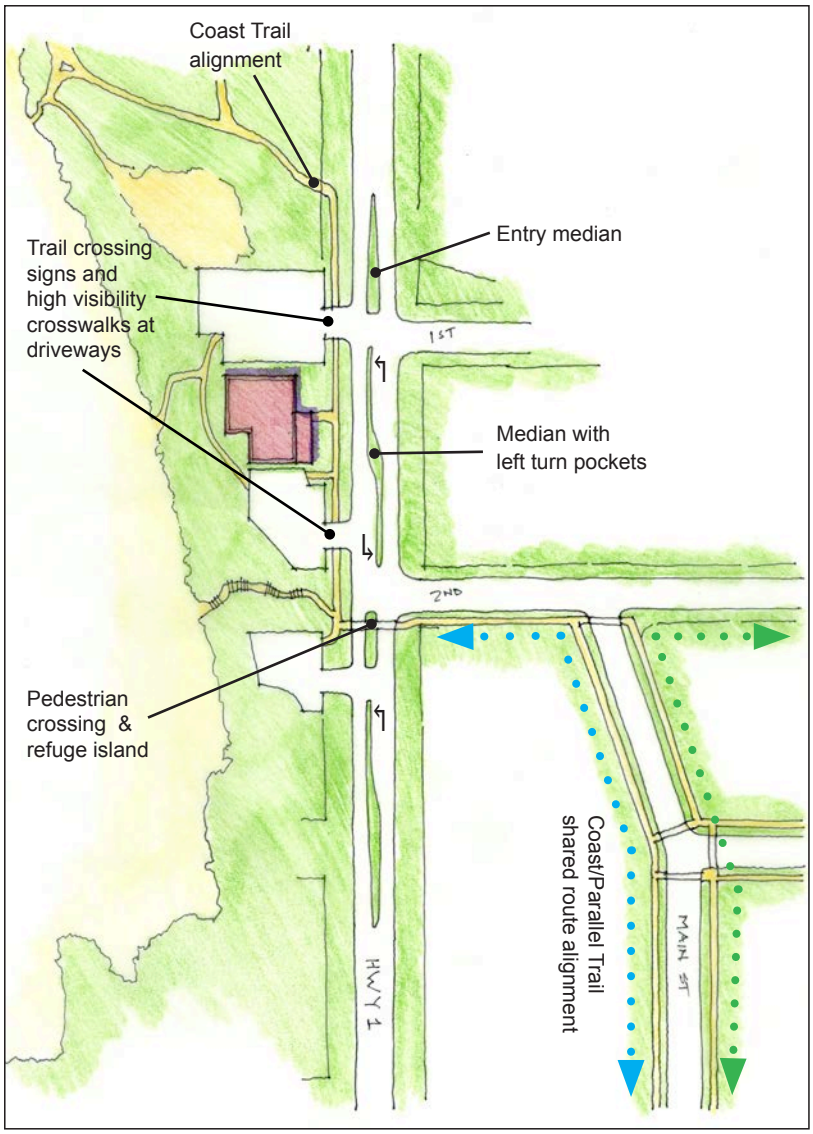
The proposed alignment of the Coastal Trail is another important consideration for the 1st Street and 2nd Street area. As noted in the previous chapter, it would follow a route parallel and east of the highway on Main Street through Montara, and then transition to the west side of the highway at Montara State Beach via 2nd Street.

Several improvements are illustrated in the drawing on the following page that are designed to strengthen awareness of community entry and facilitate reduced motor speed, orderly turning movements and access, and safer conditions for pedestrians and bicyclists.

Median on Highway 299 in Willow Creek alerts motorists they are entering the central business area.

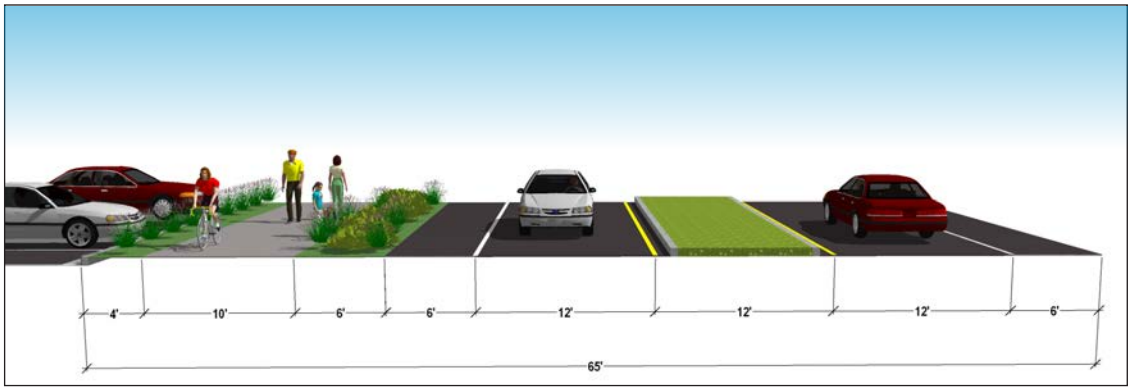
Signs and high contrast landscaping on Highway 101 support wayfinding, and signal community arrival and a change in context.

Montara North Community Entry and Circulation



Proposed Improvements:

- Raised medians from north of 1st street through south of 2nd street for gateway at the north end of the developed area of the San Mateo County Midcoast.
- Restricted access (right turns in/out) to/from central beach access lot.
- Designated pedestrian crossing at 2nd street with marked crosswalk and median refuge.
- Coastal Trail transition to west side of the highway to provide a walkway and bikeway in high use area.



Highway 1 facing north is shown above, just north of 1st Street with the Coastal Trail and the northernmost parking lot for the restaurant on the left. The existing paved width is about 48 feet. This section is designed to fit within the existing width.

Central Montara

Highway 1, northbound, approaching Montara and the intersection with 9th Street. The circles indicate opportunities for a gateway element and intersection enhancements at the community entry to facilitate place identity and awareness of changing conditions.

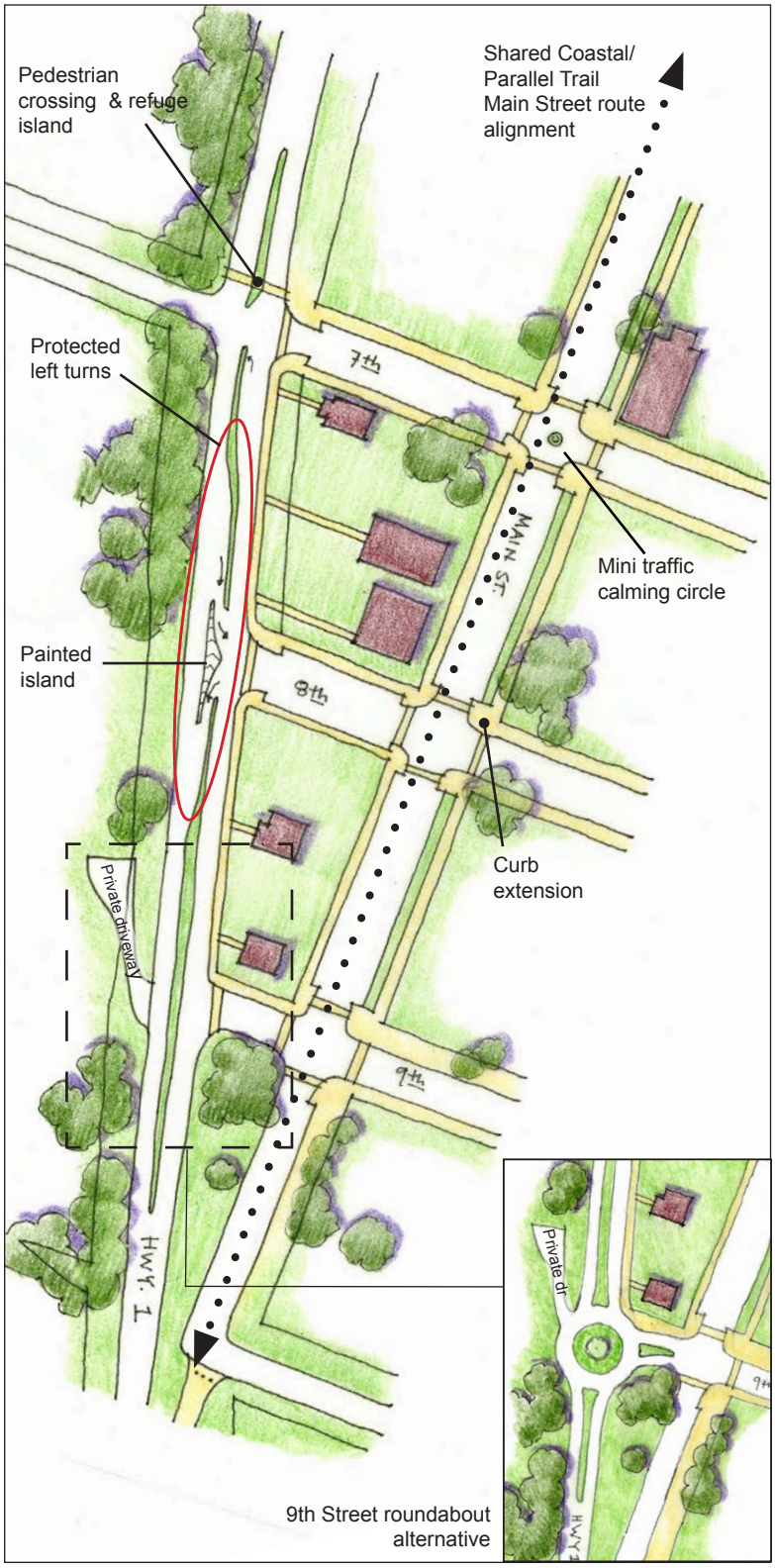
Above. *Highway 1, looking north between 9th and 8th Streets.* ***Left.*** *Aerial view of central Montara.*

A concentration of businesses and services on Main Street and Highway 1 between 6th Street and Ninth Street form a community activity node. Several properties are accessed directly from the highway, with minimal separation from the edge of the travel way, and little or no delineation of driveway entries and walkways.

7th, 8th and 9th Streets intersect the highway at close intervals, are controlled with stops signs, and provide access to Main Street and the community east of the roadway. Left turns are restricted southbound on Highway 1 onto 7th Street and restricted from 7th Street onto the highway. Turning movements are unrestricted at 8th and 9th Streets, though a right turn arrow pavement marking on 9th Street approaching Highway 1 suggests an attempt to discourage left turns at this location.

Taken together these conditions generate numerous conflicts associated with vehicles entering and exiting the highway and lack of defined space for pedestrians and bicyclists. The drawing on the opposite page illustrates proposed roadway and intersection enhancements to restrict and channelize turning movements, encourage reduced speed through the central business area, and reduce the exposure of pedestrians and bicyclists to conflicts with motor vehicles.

Proposed Circulation, Access and Pedestrian Improvements

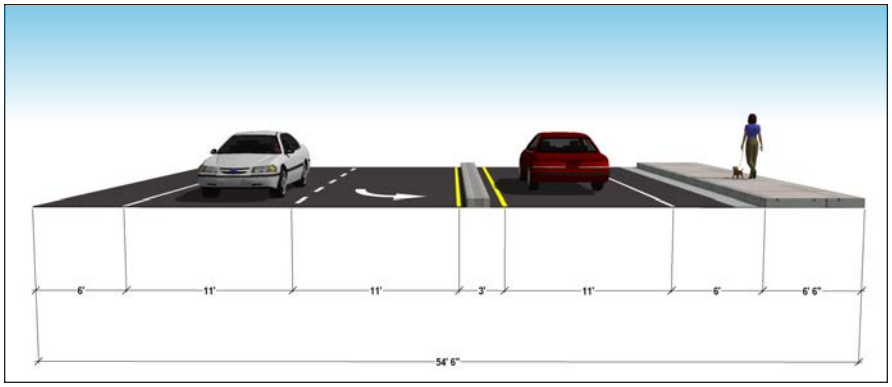


- Raised medians from north of 7th Street through south of 9th Street.
- Painted "bird shaped" island for protected left turns and merging.
- Left turns consolidated at 8th Street.
- Restricted turning movements at 9th Street or installation of roundabout.
- Sidewalks added on east side of highway between 7th and 9th Streets.
- Designated pedestrian crossing at 7th Street.
- Sidewalks, crosswalks and traffic calming improvements on Main Street.

Left turns are currently prohibited into or out of 7th Street east of Hwy 1 (with left turns to and from the west allowed), which should be continued. A crosswalk is located at 7th Street because there are residences on the west side and there is more space along the west side of the highway for walking to between 7th and 2nd Streets. Under current conditions, it is extremely difficult to cross from east to west at 7th Street because of limited sight distance between southbound vehicles and pedestrians. Adding a raised median at this location makes it possible for pedestrians to better judge when it is safe to enter each half of the street.

The median at 8th Street allows for full turning movements, including a left turn bay for southbound left turns into 8th Street and a storage lane for westbound left turns from 8th Street to Highway 1. A painted or mountable island will ensure that trucks can still turn into Montara. Left turns are eliminated at 9th Street. However, a small roundabout is shown at this location as an option for maintaining full turning movements while providing a prominent gateway feature for northbound travelers.

Highway 1 at 8th Street



Highway 1 facing north, about 20 feet north of the northernmost curb on 8th Street, with a sidewalk shown on the east side of the roadway for pedestrian access to adjacent businesses. The existing paved width is about 48 feet. This section is designed to fit within the existing width.

9th Street Roundabout Alternative

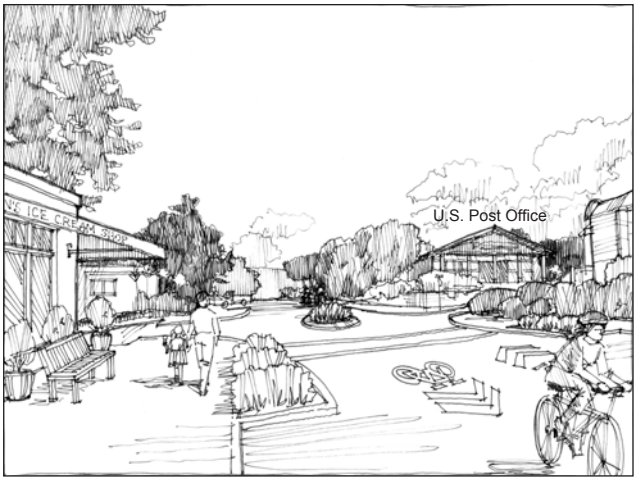
A roundabout at this location would enable vehicles to safely enter and exit the highway. It would also slow traffic speeds through central Montara and provide another safe crossing opportunity for pedestrians and bicyclists.

The detailed drawing on the right shows that there is adequate space at 9th Street for installation of a roundabout, sized to manage all through vehicles and most trucks. However, due to space limitations, this roundabout is of a size that large trucks would only be able to make through movements, and not left or right turn movements.. So left turn movements would be necessary at 8th Street in order for tractor trailer trucks to serve business in Montara.

A preliminary traffic analysis by the consultant team engineer indicated that a single-lane roundabout would operate well at 9th Street under current traffic loads.

The drawing above details a potential roundabout at 9th Street for traffic calming and efficient turning movements. Crosswalks with splitter islands provide enhanced pedestrian crossings.

Main Street at the intersection with 7th Street, looking north.



Perspective sketch of Main Street at the intersection with 7th Street with sidewalks, curb extensions, traffic calming circle and stenciled shared lane markings indicating a shared roadway for bicyclists and motorists.

Curb extension in Davis, Ca.

Traffic calming mini-circle in Sacramento.

Main Street in Montara is a low volume, slow speed street that provides an opportunity for a parallel route to Highway 1 for pedestrians and bicyclists, as well as an opportunity for small business frontage and access. This also makes it suitable for improvement as an on-street shared route for the Coastal and Parallel trails.

Portions of Main could be developed with sidewalks. Curb extensions at intersections would shorten pedestrian crossing distances, increase pedestrian visibility to motorists, and encourage slower speeds and turning movements. Class III bike route signs, trail directional signage and bike shared lane markings would provide additional guidance.

Togther these treatments would improve the viability and safety of Main Street as a shared street for all modes – walking, bicycling and driving – and users of all ages and abilities.

Montara Lighthouse Intersections

The driveway entrance to the Point Montara Lighthouse Hostel (which also provides access to the Montara Water and Sanitary District office and facility) lacks visibility to motorists traveling in both directions on Highway 1. The highway also lacks a turn lane for northbound drivers seeking to turn into the driveway.

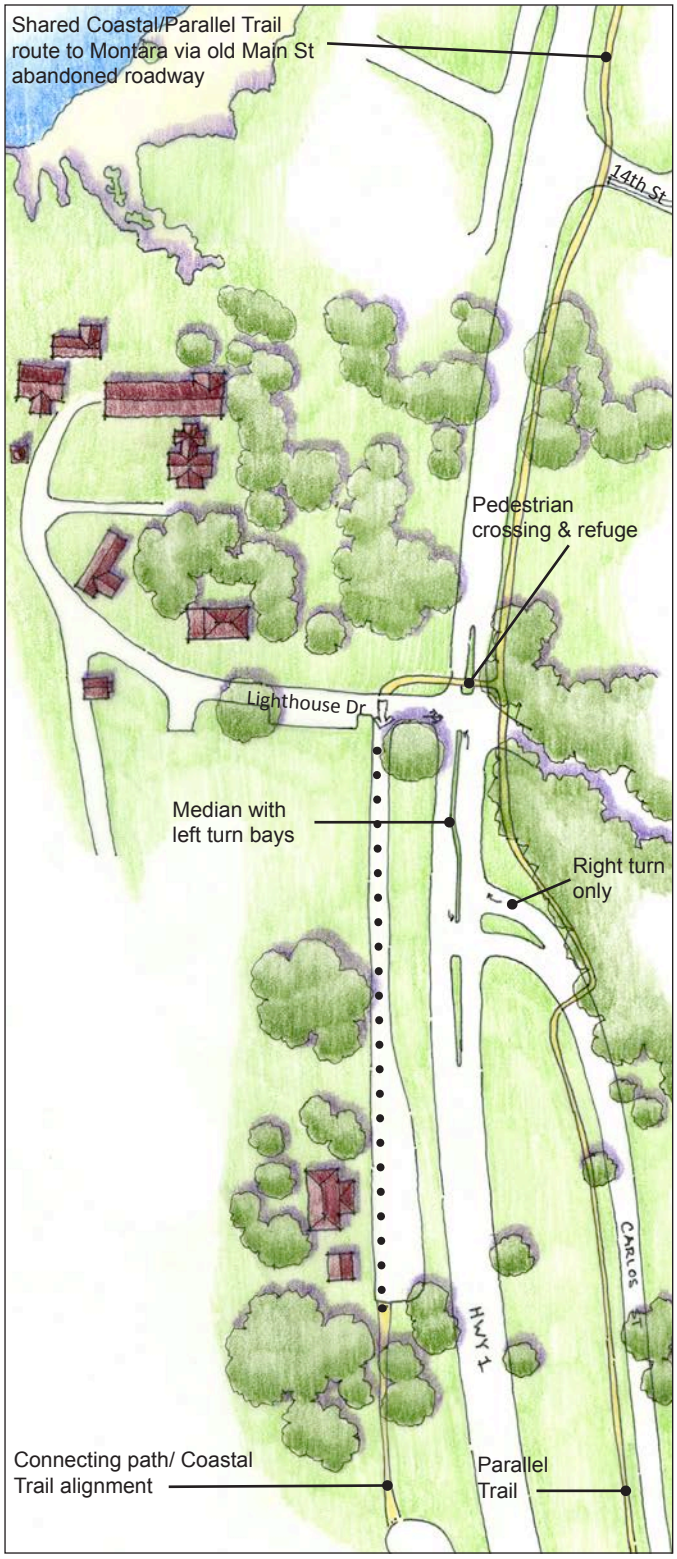
The Lighthouse driveway is in close proximity to the highway intersection with Carlos Street, located about 175 feet to the south. Carlos Street runs parallel to the highway along the east side to Moss Beach, providing a route opportunity for the Parallel Trail from Moss Beach to Montara. An access road to the Montara Water and Sanitary District building parallels the west side of the highway and comes to a dead end in alignment with the cul-de-sac at the end of Vallemar Street. Vallemar in turn provides a parallel connection to Moss Beach west of the highway, providing a route opportunity for connecting the Coastal Trail from Moss Beach to Montara Lighthouse on the west side of the highway.

Inadequate space north of the Lighthouse due to steep and rugged terrain combined with private residences requires Coastal Trail users to shift to the east side of the highway through Montara.

Short and long-term options for improving the Lighthouse intersections and providing parallel pedestrian and bicycle connections on both sides of the highway linking Montara and Moss Beach are presented on the following pages.

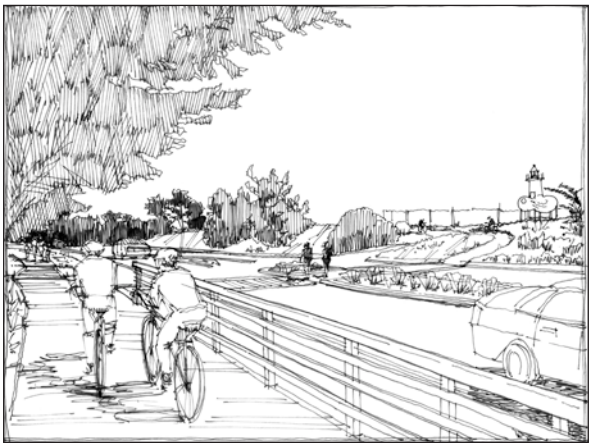
Aerial view of the Point Montara Lighthouse intersection at 16th Street at the south end of Montara.

Short Term Option: Pedestrian Crossing at Grade



The addition of medians, left turn bays, trails and designated crossing to connect trails on opposite sides of the highway is shown above.

Highway 1, facing south toward the Lighthouse entrance.

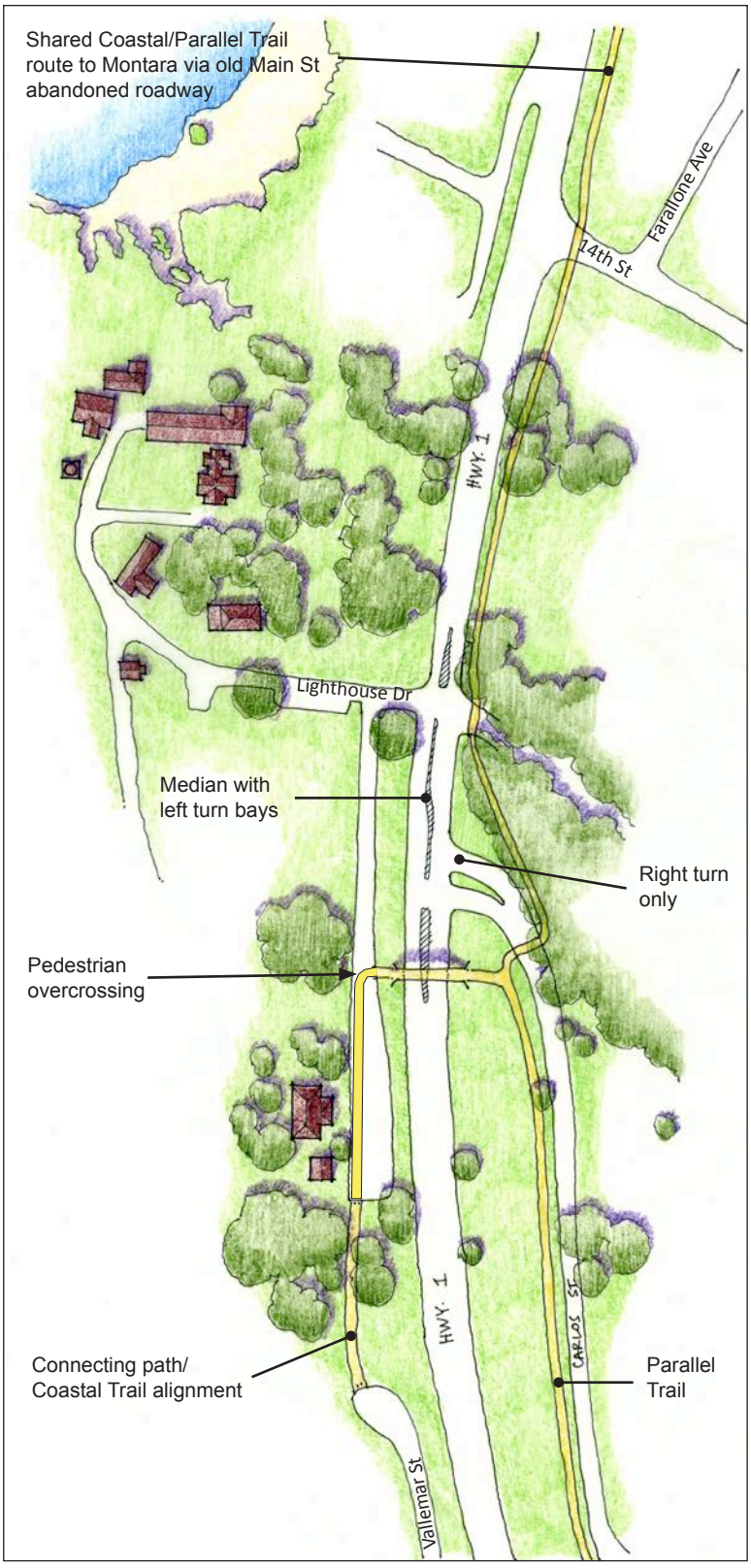


Perspective sketch of Highway 1 facing south toward the lighthouse entrance with the addition of a pedestrian crossing with a median refuge and separated trail on the east side of the roadway.

Proposed Improvements

- Raised or painted median with left turn bay southbound onto Carlos Street.
- Raised or painted median with left turn bay northbound onto Lighthouse driveway.
- Right turn only onto highway from Carlos Street.
- Full turning movements allowed from lighthouse driveway.
- Pedestrian crossing and refuge island at lighthouse driveway.

Long-Term Option: Pedestrian Overcrossing



In the long run, following trail completion on both sides of the highway, it may be possible to construct a pedestrian overcrossing to replace or in addition to the at-grade crossing at the Lighthouse intersection that would offer scenic views for trail users. Existing grade separation between the roadway and elevations on both sides of the highway south of the intersection would help reduce the extent of construction needed to gain the necessay elevation to meet minimum height clearance requirements for the highway.

Elevation and slope conditions on the east side of the highway would likely request less construction to meet elevation and ADA maximum allowable slope requirements than on the west side, where the elevation is lower. A detailed survey would be necessary to determine the impact, cost, and ultimate feasibility of a bridge at this location.

The concept on the left illustrates the same improvements shown in the previous drawing with the addition of a pedestrian overcrossing south of the intersection with Carlos Street. Existing elevations adjacent to the highway suggest the potential feasibility of constructing a bridge that would connect the Coastal and Parallel Trails on opposite sides of the highway.

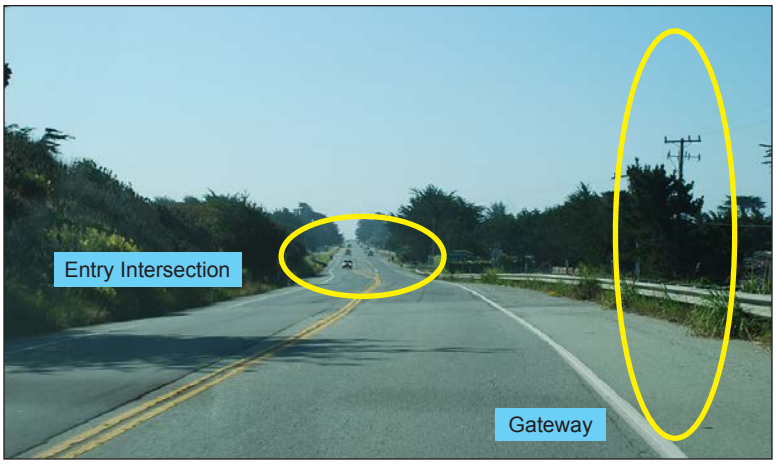
Moss Beach


VALLEMAR ST
Post Office
ETHELDORE ST
Food
CARLOS ST
WIENKE WAY
Sheriff
Market
Park
SUNSHINE VALLEY RD
Church
Food
HIGHWAY 1
CALIFORNIA AVE
VIRGINIA AVE
VERMONT AVE
Gas Station
LANCASTER AVE
TERRACE AVE
ETHELDORE ST
MARINE BLVD
CYPRESS AVE

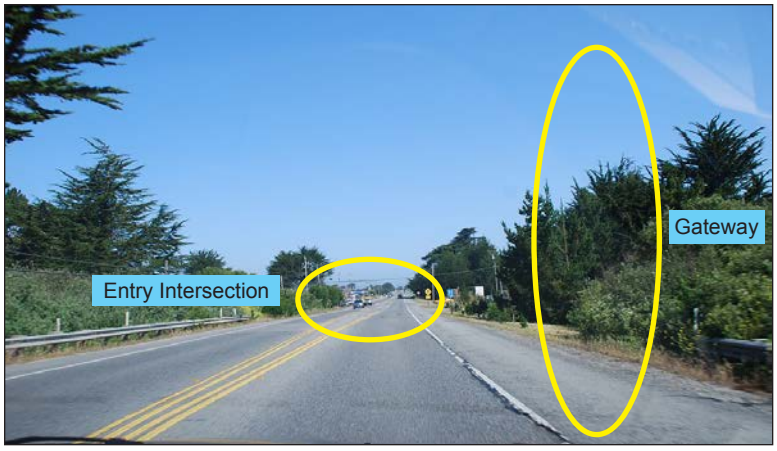
Highway 1 bisects Moss Beach, with residential neighborhoods, services and attractions on both sides, requiring motorists and non-motorists to frequently use and cross the highway for travel within the community. There are nine intersections (one 5-way, five 4-way, and three 3-way) with full turning movements within a span of seven-tenths of a mile. A parallel frontage road provides access to a post office, market, sheriff substation and other businesses on the east side of the highway. A restaurant, gas station and residences are directly accessed from the highway on the west side.

8-foot shoulders provide space for bicyclists, but there are no defined walkways on either side of the roadway or designated crosswalks. Crossing distances are about 60 feet between intersections, reach up to 80 feet at intersections due to large corner radii, and the posted speed limit is 50 miles per hour, creating difficult and hazardous crossing conditions for all modes.

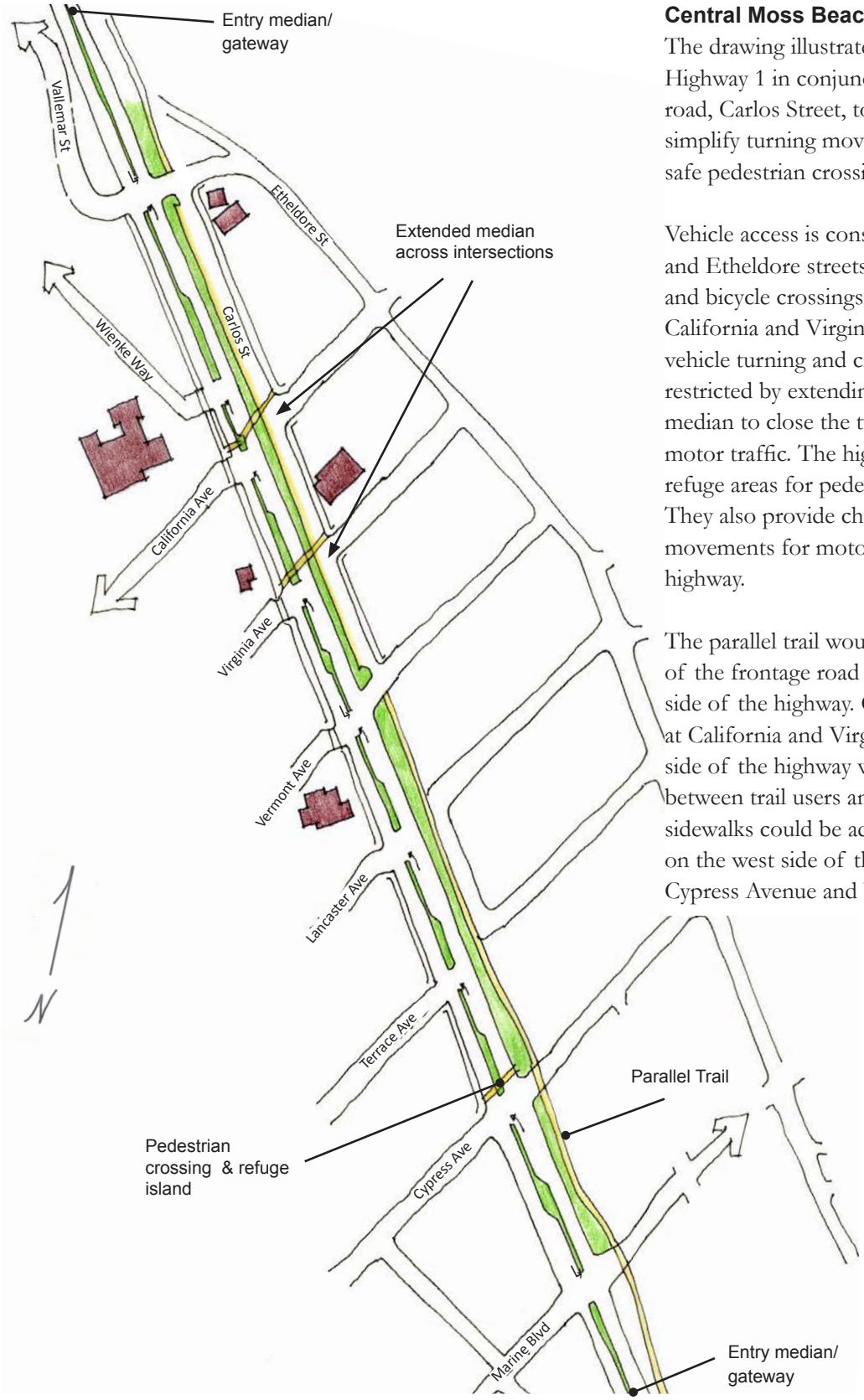
The frequency of side street and driveway accesses combined with high traffic speeds generate numerous conflicts associated with vehicles entering and exiting the highway. In addition, pedestrians and bicyclists have to navigate wide crossings and skewed intersections with turning vehicles accelerating to merge onto the highway or eager to finish turns off the highway to clear the travel way. Proposed solutions shown on the following pages include roadway and intersection enhancements to consolidate access and simplify turning movements, encourage reduced speeds through the community, and reduce pedestrian and bicyclist exposure to conflicts with motor vehicles.



Highway 1, southbound, approaching Moss Beach and the intersection with Etheldore and Vallemar Streets. The circles indicate potential opportunities for elements that announce community arrival, increase visibility of the approaching intersection and define entry into a increased activity zone.



Highway 1, northbound, approaching Moss Beach and the intersection with Marine Boulevard.

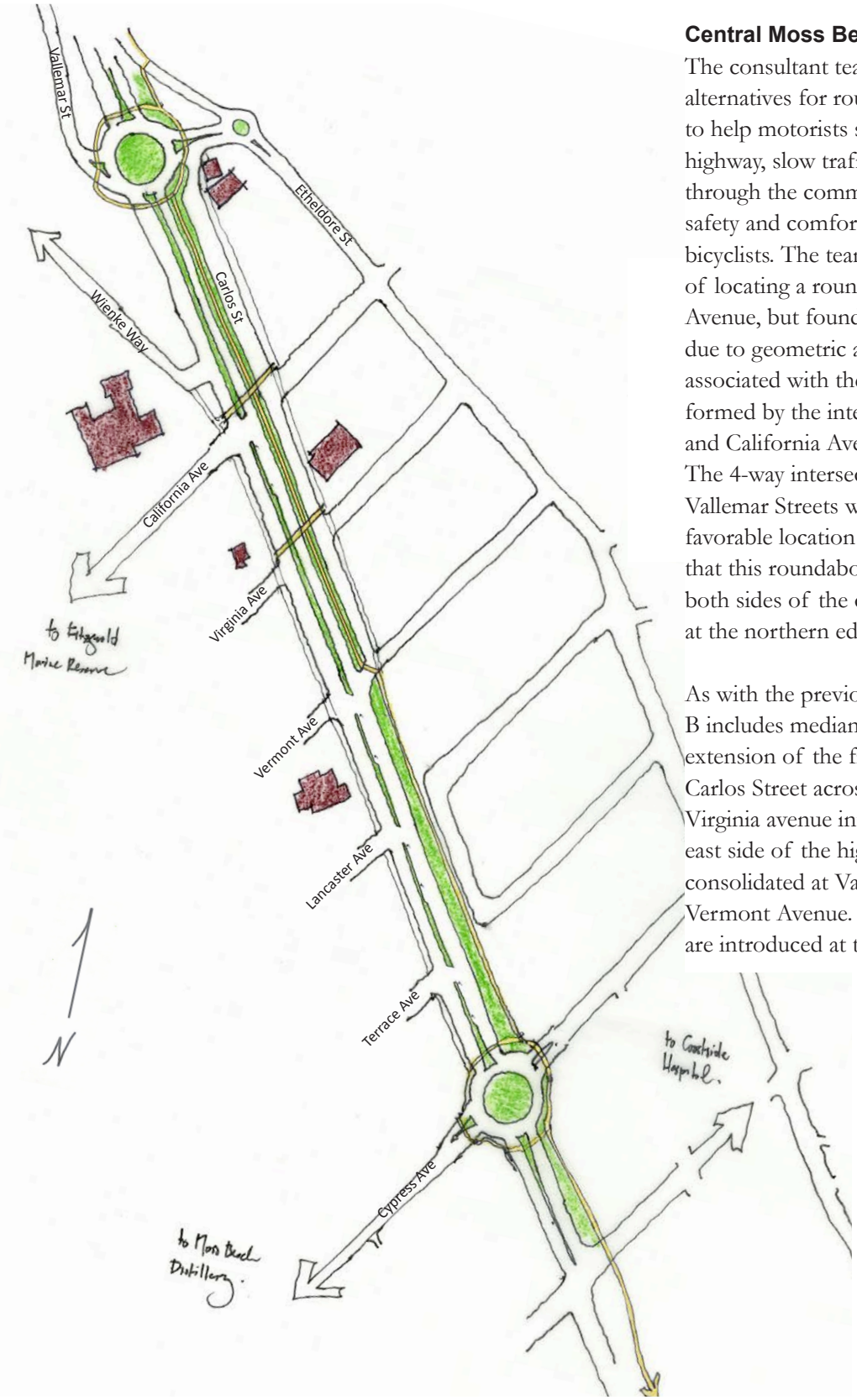


Central Moss Beach: Option A

The drawing illustrates the use of medians on Highway 1 in conjunction with the frontage road, Carlos Street, to manage vehicle access, simplify turning movements, and organize safe pedestrian crossing points.

Vehicle access is consolidated to Vermont and Etheldore streets. Designated pedestrian and bicycle crossings are provided at California and Virginia avenues, where vehicle turning and crossing movements are restricted by extending the frontage road median to close the two intersections to motor traffic. The highway medians provide refuge areas for pedestrians and bicyclists. They also provide channelized left turn movements for motorists on and off the highway.

The parallel trail would follow the alignment of the frontage road and median on the east side of the highway. Closing the intersections at California and Virginia avenues on the east side of the highway would reduce conflicts between trail users and traffic. Over time, sidewalks could be added to serve pedestrians on the west side of the highway between Cypress Avenue and Wienke Way.

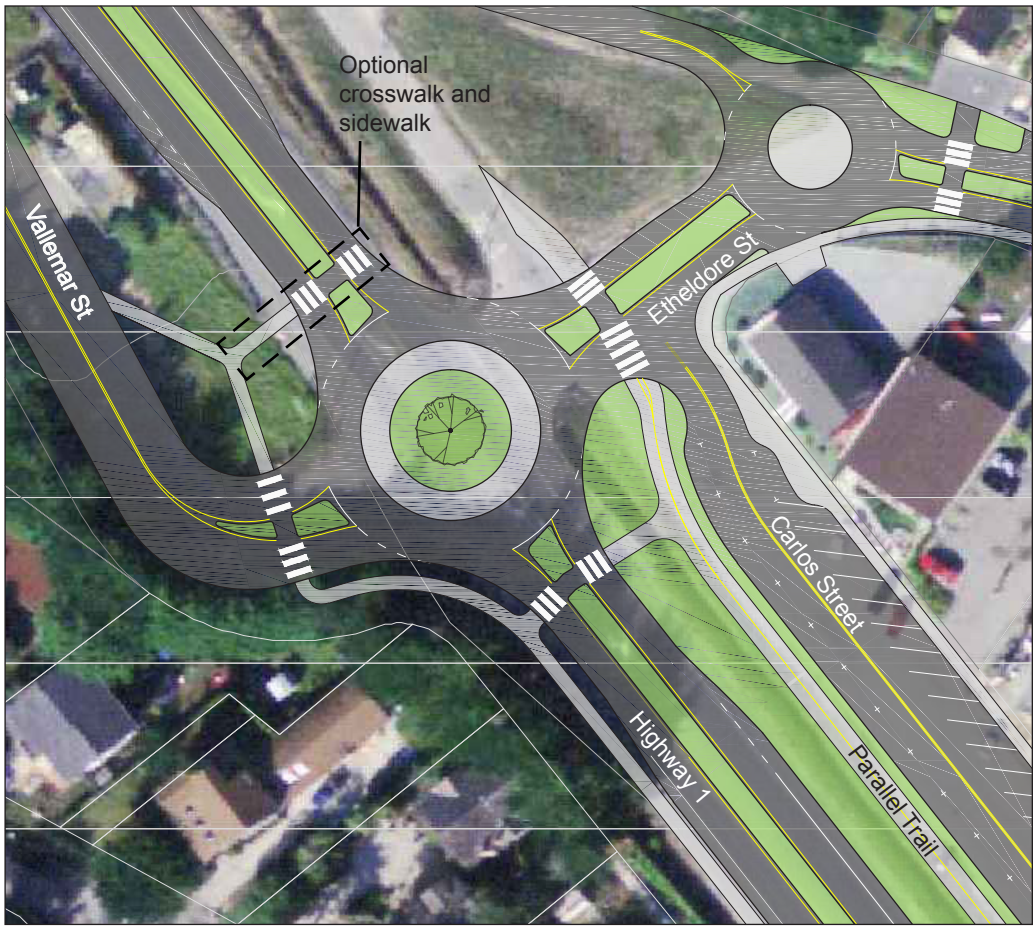


Central Moss Beach: Option B

The consultant team considered potential alternatives for roundabouts in Moss Beach to help motorists safely enter and exit the highway, slow traffic and maintain flow through the community center, and improve safety and comfort for pedestrians and bicyclists. The team studied the possibility of locating a roundabout at California Avenue, but found conditions challenging due to geometric and circulation constraints associated with the 5-way intersection formed by the intersection of Wienke Way and California Avenue with Highway 1. The 4-way intersection with Etherldore and Vallemar Streets was determined a more favorable location with the added advantage that this roundabout provides access to both sides of the community and a gateway at the northern edge of central Moss Beach.

As with the previous option, Option B includes medians on Highway 1 and extension of the frontage median along Carlos Street across the California and Virginia avenue intersections on the east side of the highway, with access consolidated at Vallemar Street and Vermont Avenue. A pair of roundabouts are introduced at the north and south entry

Etheldore/Vallemar Street



The drawing illustrates a roundabout at the north entry to central Moss Beach and to Carlos Street, a parallel frontage road that serves as the community's main street. A smaller mini-circle norhteast of the roundabout enables vehicles exiting Carlos Street to easily make u-turns back to the highway. Formal diagonal parking and parallel parking is marked on Carlos Street. The Parallel Trail passes through on the west side of Carlos and crosses the slow speed intersection created by the roundabout.

intersections to Moss Beach at Etheldore/Vallemar Street and Cypress Avenue to reduce speeds and crash risks between through traffic and vehicles entering and exiting the highway. Placing roundabouts in a pair at these two locations, spaced a little under 1/2 mile apart, also creates an opportunity to reduce the number of left turns on and off the highway in between as the roundabouts provide convenient opportunities for left turns and u-turns.

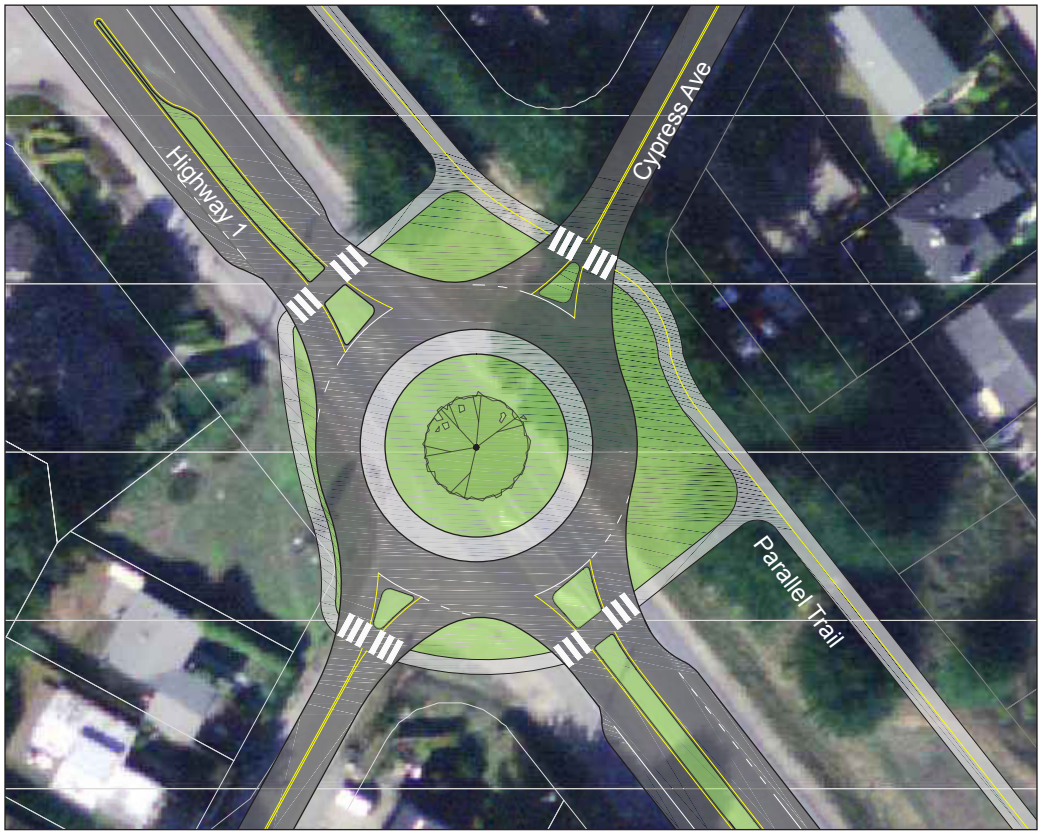
Pedestrians and bicyclists would benefit from the slower speed environment where they need to cross the highway and would have additional convenient crossing opportunities at both roundabouts. As in the previous drawing, the parallel trail would follow the alignment of the frontage road and median on the east side of the highway.

The median would be designed to allow left turns in and out of California Avenue to and from the highway heading north. Left turns could also be added for northbound traffic on the highway into Lancaster and Terrace Avenues since there are fewer route options for access to residences on these two streets.

The detailed drawings above and on the next page show that there is adequate space at

Cypress Avenue

The drawing illustrates a roundabout at the south entry to central Moss Beach at Cypress Avenue, a street that provides access to Seal Cove, Princeton and Pillar Point Harbor via Airport Road. The roundabout would facilitate efficient turning movements, especially left turns from Cypress onto the highway southbound, and from Cypress onto the highway northbound. The roundabout would also create enhanced crossing conditions for Parallel Trail users.

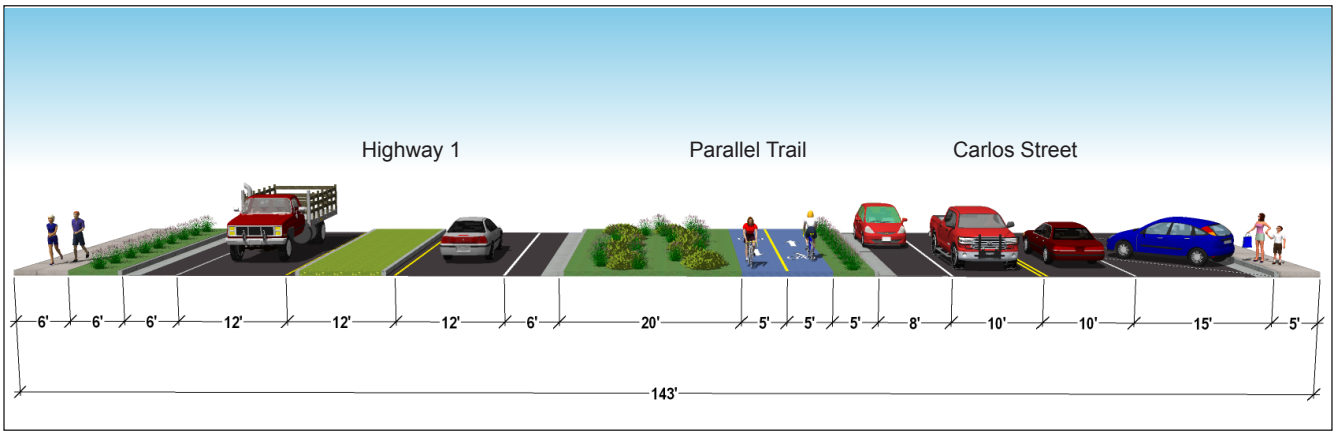


both locations for installation of a roundabout, sized and equipped with a mountable truck apron for large turning vehicles.

Based on traffic counts from the 2010 Environmental Impact Report prepared for the proposed Big Wave development, a traffic evaluation by the consultant team engineer using roundabout analysis methodology from the 2010 Highway Capacity Manual showed that single-lane roundabouts at Etheldore/Vallemar Street and Cypress Avenue would operate well within capacity under current loads. If the Big Wave were to be built, with added future left turn volumes from eastbound Cypress to northbound Highway 1, a conventional analysis shows the northbound direction of Highway 1 would operate near capacity at Cypress Avenue during a portion of the weekday pm peak hour. A summary of the results of the analysis at Cypress is included in the Appendix.

Example of a single lane roundabout in Keene City, New Hampshire. Photo source: New Hampshire Department of Transportation: www.nh.gov/dot/org/projectdevelopment/highwaydesign/roundabouts/index.htm

Highway 1 and Carlos Street in Central Moss Beach



Highway 1 and Carlos Street are shown above, looking north between Etheldore Street and Virginia Avenue. The existing paved highway width is about 54 feet in this area. In an addition to a new median, a sidewalk is added to serve pedestrians on the west side of the highway that would eventually run from Vallemar Street to Cypress Avenue. The Parallel Trail and Carlos Street would provide pedestrian and bicycle access on the east side.

Carlos Street looking north from Virginia Avenue as it exists today.

Carlos Street with the addition of the parallel trail with a landscaped buffer.

Carlos Street and the Parallel Trail

Carlos Street in Moss Beach is a low volume, slow speed parallel frontage road on the east side of the highway that serves as a main street for local businesses and services. The 50-foot wide road and 25-foot wide adjacent median between the road and highway offer ample space for routing the Parallel Trail, other bicycle enhancements, and pedestrian improvements that integrate stormwater management facilities, sidewalks, landscaping and permeable materials.

The upper photo on the left shows Carlos Street as it exists today, looking northward toward the intersection with California Avenue. Through simulation in the image below, the Parallel Trail is added, separated by a landscaped buffer.

Simulations on the following page help visualize additional potential enhancements on Carlos Street.

In the top image on the right, curb and gutter are added to improve drainage and clearly delineate parking and separation between the street and pedestrian realm. Back-in angled parking on the east side of the street enables motorists to see bicyclists and face traffic when departing. A parking supply analysis by the consultant team found that extension of formalized angled parking from Virginia Avenue to Etheldore Street would increase supply on Carlos Street by 26%.

Shared lane markings are included to alert motorists of the presence of bicyclists and show bicyclists the preferred path of travel. Bicycle racks are shown on an extended corner next to the market. Pedestrian-scale street lamps with opaque covers direct lighting downward to the sidewalk and maintain dark skies. The large roof sign on the market is replaced by a decorative pedestrian-oriented sign on the front of the building.

Street trees are shown in the bottom image as a potential additional feature to encourage slower speeds by framing and enclosing the street. Street trees would also provide a buffer between the highway and the trail, sidewalk and buildings on Carlos Street. Climate appropriate species would be selected, placed and maintained for air and water quality benefits, aesthetics and preservation of views.

Carlos Street with additional bicycle and pedestrian enhancements.

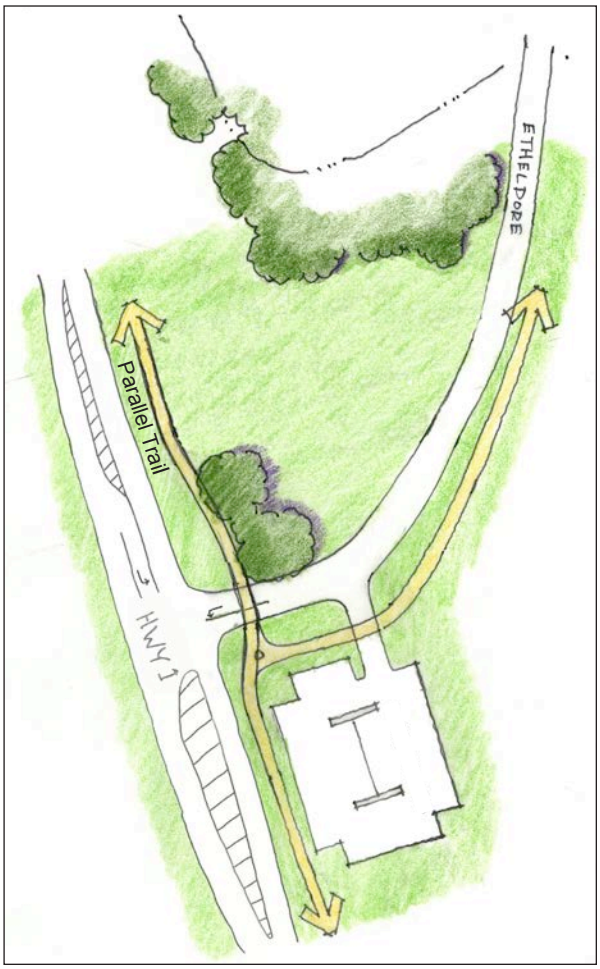
Carlos Street with street trees added between the street and trail and between the street and walkways and buildings on the east side of the street.

Trail Access South of Moss Beach

As previously noted, one of the proposed alignments for the Parallel Trail runs along the east side of the highway between El Granada and Moss Beach, then follows the Carlos Street alignment to Montara. The National Park Service has been studying options for access points south of Moss Beach to Rancho Corral de Tierra trails that have recently become part of the expanded Golden Gate National Recreation Area.

The drawings at the top of the page and on the next page illustrate concepts for establishing a visible and accessible focal point at the existing intersection of Highway 1 and Etheldore Street where turning movements already occur and slower highway speeds are encouraged. The intersection provides a south entry to Moss Beach and access to the Moss Beach Corral and Equestrian Center.

Etheldore Street: Option A



The drawing above illustrates a parking lot that could serve visitors seeking access to GGNRA trails south of Moss Beach. The lot could be sized to accommodate between approximately 20 to 50 spaces. Painted medians with a left turn bay and storage for left turns onto the highway from Etheldore Street would facilitate safe turnng movements.

The posted highway speed limit is reduced from 55 to 50 mph and a Moss Beach community entry sign is posted on the northbound approach to the intersection.

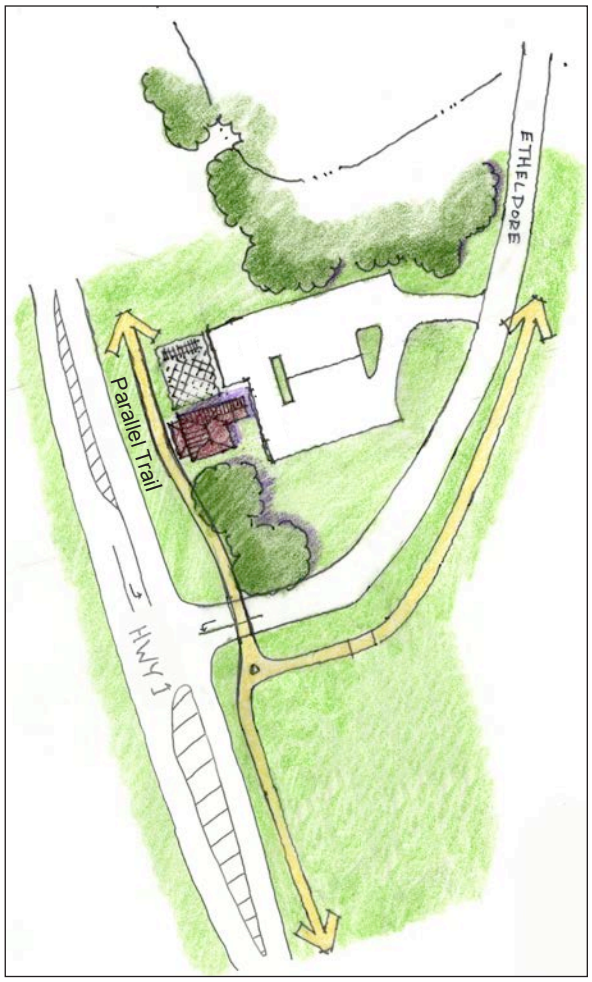
The illustrations show a trailhead and small parking lot either on the southeast or northeast corner of the highway intersection with frontage on the Parallel Trail that would be reached from the highway via Etheldore Street. This would provide a trail entry point recognizabe and accessed from the highway, located to reduce visitation impacts on residential neighborhoods in Moss Beach and El Granada. Simple painted medians added to the highway would provide space for left turns to and from Etheldore Street.

The parking area could initially be developed with approximately 20 spaces and signage directing visitors to trails and other destinations. In time the area could be expanded to accommodate increased demand and include facilities such as restrooms, an unstaffed kiosk, or other amenities for visitors and trail users.

As note previously, the parking area would be designed with low impact techniques for drainage and appearance in accord with the San Mateo County Sustainable Green Streets and Parking Lots Design Guidebook. Green streets and green parking lots are designed to mimic drainage patterns of the natural landscape. For more information, go to: www.flowstobay.org/ms_sustainable_streets.php

Another alternative location for trail access under early consideration by the National Park Service is at the northwest corner of the agriculture field, approximately 1,600 feet south of Etheldore Street on the east side of the highway. Further analysis may reveal fewer topographical constraints and environmental and other considerations at this location. However, from the standpoint of highway operations, vehicle access would introduce a new area of highway exit and entry activity where none currently exists in a higher speed location.

Etheldore Street: Option B

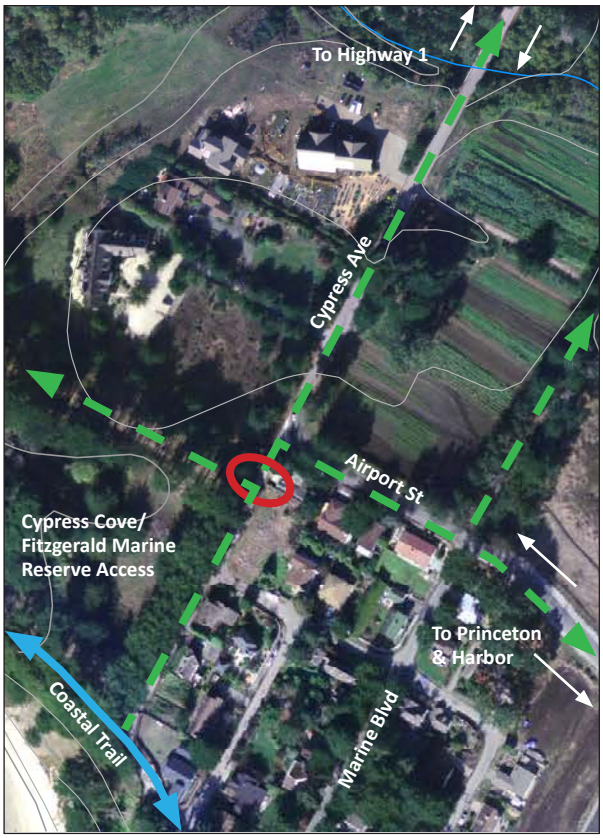


The drawing above illustrates the same highway improvements shown in the previous drawing, but includes a parking lot and visitor center on the northeast corner of Highway 1 and Etheldore Street. Relatively flat terrain on the northeast corner compared to the sloped terrain on the southeast corner would facilitate space to accommodate additional facilities. But further study would be required to assess potential constraining factors on site development, such as the proximity of San Vicinte Creek, located approximately 100 feet north of the parking area as shown in the concept.

Highway 1 facing south a the intersection with Cypress Avenue.

Barrier where Cypress Avenue dead ends just past the intersection with Airport Street.

Perspective sketch of the Cypress dead end with improved path, entry and gateway elements.



Aerial view of the junction of route alignments in the South Moss Beach/Seal Cove area. The red circle shows a barrier that could be improved for enhanced trail connectivity.

Smaller scale opportunities exist to strengthen trail identity and linkage between different route segments. For example, Cypress Avenue and Airport Street provide a fairly direct alternative route to the highway from Moss Beach to Pillar Point Harbor with no substantial topographic constraints, and few driveways or intersections that would pose conflicts between vehicles and trail users. As shown in the images above and on the left, a barrier at the end of Cypress Avenue could be replaced with an entry and gateway elements to enhance trail continuity and wayfinding between this segment, the Coastal Trail, Fitzgerald Marine Reserve and other route connections.

El Granada/Surfers Beach Alternatives

The stretch of Highway 1 and surroundings between Capistrano Road and Coronado Street was an area of intense community concern and stakeholder interest during the 2009/2010 Phase 1 study that focused on the highway between Half Moon Bay Airport and Frenchman's Creek Road. Four design alternatives were developed with community input to improve pedestrian and bicycle safety, access to trails, and motor vehicle circulation and parking.

The coastline near El Granada between the east jetty at Pillar Point Harbor and Miramar, also known as the Surfers Beach area, is eroding and moving toward the highway. As a result, three of the alternatives that were developed included eventual realignment of the roadway further inland between Capistrano and Coronado to avoid loss of the roadway and to create restoration opportunities between the highway and the ocean. The other alternative was presented as a shorter term option without roadway realignment that would make use of land on the inland side of the highway within Caltrans right-of-way to better organize parking and pedestrian crossing activity.

During the course of the current Phase 2 study, the consultant team had the opportunity to revisit the highway corridor design concepts for the El Granada/Surfers Beach area. A new alternative has been developed that involves minimal realignment of the highway and is presented as a short-term concept (relative to substantial re-routing of the roadway) in the pages that follow. The short-term option from the previous Phase 1 study is shown first for comparison.

A roundabout is shown in the new alternative at the signalized intersection with Capistrano Road and could also be explored as an option for this intersection in the previous alternatives. In addition to the safety benefits noted previously (page 32), a roundabout at this location has the potential to increase intersection capactiy. Because of the free flow nature of a roundabout compared to a stop-controlled intersection, the slower speeds and closer vehicles tend to travel through roundabouts, in many situations more vehicles can go through a roundabout during a given period than a conventional stop-controlled intersection. Studies show that a roundabout can process about 30% more traffic than other types of intersections.

Preliminary analysis by the consultant team engineer suggests a roundabout would fit within the existing right of way. In the short term a single lane roundabout would likely provide an acceptable level of service under existing volumes. In the long term the roundabout may require two lanes on the Highway 1 approaches and one lane on the other approaches depending upon future increases in volumes. Two lanes in both directions at the intersection would be similar to the current conditions with the signal (not including the dedicated right and left turn lanes which would not be required with a roundabout). A traffic evaluation of roundabout performance at the intersection with single and two-lane configurations using analysis methodology from the 2010 Highway Capacity Manual is included in the Appendix.

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Insert El Granada Option A
Insert El Granada Option E
(11" x 17" Foldouts)

Appendix

Funding Resources

There are a variety of local, State and Federal transportation sources that could potentially help fund improvements identified in the Highway 1 Safety and Mobility Improvement Study. Larger projects will generally require more detailed feasibility studies, with scoping of the physical work. Projects must then compete for available funding from the variety of available sources. Some sources will help fund the detailed scoping of projects and engineering design needed prior to securing funds for actual construction.

Common sources of funding with eligiblity requirements are available through Caltrans' Divsion of Local Assistance. Transportation funding opportunities can be viewed at: http://www.dot.ca.gov/hq/LocalPrograms/lam/lagb.htm

The Rails-to-Trails Conservancy Western Region Office has prepared an overview of California pedestrian and bicycle funding opportunities. A number of these can fund design and construction, as well as acquisition of land needed for proposed projects. One of their updated listings is included on the following page. More information can be found on the Rails-to-Trails Conservancy web site at http://www.railstotrails.org/ourwork/trailbuilding/toolbox/informationsummaries/funding_financing.html

The San Mateo County Comprehensive Bicycle and Pedestrian Plan, adopted by the City/County Association of Governments of San Mateo County on September 6, 2011, also contains a comprehensive list and description of potential local, State and Federal funding sources for proposed projects in the document entitled, "Resource Guide for the Education, Promotion, Funding, and Design of Pedestrian and Bicycle Facilities." This document and the entire plan can be accessed going to the C/CAG web site at: http://sanmateocountybikepedplan.org/index.php?cID=242

California Bicycle and Pedestrian Funding Opportunities

Prepared by Rails-to-Trails Conservancy Western Region Office

Updated September, 2011

Agency	Funding Source	Project Eligibility	Deadlines	Amount Available (annually in CA unless otherwise noted)	Contact Info	Web site
CT	Bicycle Transportation Account	1, 2, 3, 4, 5, 6	Call for projects generally in December with applications due in Jan. or Feb.	$7.2 million total expected to be allocated; max for one applicant $1.8 million; bike plan adopted by Cal Trans req'd; min. 10% matching req'd	Caltrans Bicycle Facilities Unit - Penny Gray, 916-653-2750, penny.gray@dot.ca.gov	http://www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm
CC	Coastal Conservancy	1, 2, 3, 4	Proposals accepted on a continuing basis	Varies	Must work with regional staff prior to submission. Contact depends on location, see website.	http://scc.ca.gov/applying-for-grants-and-assistance/forms/
CT	Community-Based Transportation Planning Grants	2, 3, 5	Application available in December and generally due late March/early April	Budget is $3 million, each project not to exceed $300,000	C. Edward Philpot, Jr., 916-653-8817, c_edward_philpot@dot.ca.gov	www.dot.ca.gov/hq/tpp/grants.htm
CT	Environmental Justice: Context-Sensitive Planning	2, 3, 5	Application available in December and generally due late March/early April	Budget is $3 million, each grant not to exceed $250,000	C. Edward Philpot, Jr., 916-653-8817, c_edward_philpot@dot.ca.gov	www.dot.ca.gov/hq/tpp/grants.htm
CRA	Environmental Enhancement and Mitigation Program	1, 3, 4, 8, 9	Applications due Sept. 12, 2011; sign up on Resources Agency website to receive notification	Total of $10 million available	EEM Program Coordinator at (916) 653-2812 or eemcoordinator@resources.ca.gov	www.resources.ca.gov/eem
NPS	NPS Rivers, Trails and Conservation Assistance Program	4, 5, 6, 9	Due August 1 for the following fiscal year (Oct 1 - Sept 30)	Grants are for technical assistance, not funding	Program Manager Barbara Rice, 415-623-2320, barbara_rice@nps.gov	http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html
SP	Recreational Trails Program	1, 3, 4, 5, 6	For FY 2011/12 projects, app due October 1, 2011, but may be revised to Jan. 9	Estimated $2.1 million statewide; depends on federal transportation reauthorization	Office Chief Patti Keating, 916-651-8597, pkeating@parks.ca.gov, or your county Project Officer: http://www.parks.ca.gov/default.asp?page_id=21369	http://www.parks.ca.gov/default.asp?Page_id=24324
CT	Safe Routes to School - California	1, 3, 4, 5	2011 round due July 15	$24.25 million annually	Contact your Safe Routes to School District Coordinator: http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/documents/SR2SDistCoord_4_8_10final.pdf or your Ditrict's Local Assistance Contact: http://www.dot.ca.gov/hq/LocalPrograms/dlae.htm	http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm
CT	Safe Routes to School - Federal	1, 3, 4, 5	Next cycle in 2011 - pending the reauthorization of federal transportation bill	$23 million annually	Contact your Safe Routes to School District Coordinator: http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/documents/SR2SDistCoord_4_8_10final.pdf or your Ditrict's Local Assistance Contact: http://www.dot.ca.gov/hq/LocalPrograms/dlae.htm	http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm
MPO	TDA Article 3 Funds	1, 2, 3, 4, 5	Dates vary by Region. Applicants must check with their Regional Transportation Planning Agency to obtain the deadline for applications.	varies by region	Contact your local transportation agency	Bay Area website: http://www.mtc.ca.gov/funding/STA-TDA/
SP	Habitat Conservation Funds	1,2,3,4,6	Application due Oct. 3, 2011	$2 million per year to fund habitat restoration and trails, one of the seven grant categories is "Trails with access to wildlife areas" Grants for trails usually under $200,000. Expires 2020. Dollar-for-dollar match required.	Supervisor Richard Rendon at rrend@parks.ca.gov or (916) 651-7600, or to HCF Lead Project Officer John Mason @ jmason@parks.ca.gov or (916) 651-3143	http://www.parks.ca.gov/?page_id=21361
CAHCD	Community Development Block Grants – Small Cities/Counties	4	Applications are continuously received and reviewed throughout the year. Awards are made on an ongoing basis, normally within 60 days of HCD receipt of a completed application	Available to "non-entitlement" cities (under 50,000) and counties (under 200,000). Grants of up to $500,000 for eligible cities and counties to lend to identified businesses, or use for infrastructure improvements necessary to accommodate the creation, expansion, or retention of identified businesses.	Program Administration: (916) 552-9398	http://www.hcd.ca.gov/fa/cdbg/
WCB	Wildlife Conservation Board (WCB) Public Access Program	4	Accepted on a year-round basis. Board meets Feb. May Aug. & Nov. Review process generally 6 months	up to $250,000 dollars available per project (total resources $1 million per year)	Ashley Lackey, Public Access Program Coordinator, (916) 323-3417, alackey@dfg.gov, Peter Perrine, Pgm. Mgr., pperrine@dfg.ca.gov, 916-445-1109	http://www.wcb.ca.gov/Access/criteria.html
SP	Land and Water Conservation Funds	1,2,3,4	November 1, 2011 for local agencies and September 1, 2011 for State applicants	$1.7 million per year total; this is a reimbursement pgm. for up to 50% of costs	Tel: 916-653-7423 localservices@parks.ca.gov	http://www.parks.ca.gov/?page_id=21360
CT	Transportation Enhancements	1, 2, 3, 4, 5	Dates vary by Region. Applicants must check with their Regional Transportation Planning Agency to obtain the deadline for applications.	$75-85 million per year statewide	TE Program Coordinator John Haynes at 916-653-8027 or john_haynes@dot.ca.gov or your Local Assistance contact: http://www.dot.ca.gov/hq/LocalPrograms/dlae.htm	http://www.dot.ca.gov/hq/TransEnhAct/TransEnact.htm

Agencies: CT Dept. of Transportation (Caltrans), CC-Coastal Conservancy, CRA-California Resources Agency, NPS-National Park Service, SP-State Parks, MPO-Metropolitan Planning Organization, CAHCD – California Dept of Housing and Community Development, WCB - Wildlife Conservation Board

Project Eligibility Codes: 1-Acquisition, 2-Planning, 3-Design, 4-Construction, 5-Education, 6-Maintenance, 7-Capital improvements, 8-Must mitigate environmental impacts of an existing transportation project, 9-Restoration and management of coastal lands or waters

Travel Time Analysis with Existing and Reduced Speeds

Begin	End	Length		Current Speed	Future Speed	Speed	Time	Current Time	Future Time	Change in Time
		mi	*feet*	*mph*	*mph*	*fps*	*mins*	*secs*	*secs*	
Montara Lot	No. Montara									
37.05	36.67	0.38	2,006	45		66	0.51	30.40		
37.05	36.67	0.38	2,006		40	59	0.57		34.20	
										3.80
No. Montara	No. Moss									
36.7	35.95	0.75	3,960	45		66	1.00	60.00		
36.7	35.95	0.75	3,960		40	59	1.13		67.50	
										7.50
No. Moss	So. Moss									
35.95	34.85	1.1	5,808	50		73	1.32	79.20		
35.95	34.85	1.1	5,808		40	59	1.65		99.00	
										19.80
So. Moss	No. Airport									
34.85	34.45	0.4	2,112	50		73	0.48	28.80		
34.85	34.45	0.4	2,112		45	66	0.53		32.00	
										3.20
No. Airport	So. Airport									
34.45	33.95	0.5	2,640	55		81	0.55	32.73		
34.45	33.95	0.5	2,640		55	81	0.55		32.73	
										-
So. Airport	Capistrano/Obispo									
33.95	33.361	0.589	3,110	50		73	0.71	42.41		
33.95	33.361	0.589	3,110		45	66	0.79		47.12	
										4.71
Capistrano/Obispo	Cortez									
33.361	31.96	1.401	7,397	50		73	1.68	100.87		
33.361	31.96	1.401	7,397		40	59	2.10		126.09	
										25.22
Cortez	Frenchmens Creek									
31.96	30.225	1.735	9,161	45		66	2.31	138.80		
31.96	30.225	1.735	9,161		40	59	2.60		156.15	
										17.35
	Total Time (secs)							513.21	594.79	81.58
	Total Time (mins)							8.55	9.91	1.36

Travel Time Analysis with Existing and Reduced Speeds and Moss Beach Roundabouts

Begin	End	Length		Current Speed	Future Speed	Speed	Time	Current Time	Future Time	Change in Time
		mi	*feet*	*mph*	*mph*	*fps*	*mins*	*secs*	*secs*	
Montara Lot	No. Montara									
37.05	36.67	0.38	2,006	45		66	0.51	30.40		
37.05	36.67	0.38	2,006		40	59	0.57		34.20	
										3.80
No. Montara	No. Moss									
36.7	35.95	0.75	3,960	45		66	1.00	60.00		
36.7	35.95	0.75	3,960		40	59	1.13		67.50	
										7.50
No. Moss	So. Moss									
35.95	34.85	1.1	5,808	50		73	1.32	79.20		
35.95	34.85	1.1	5,808		40	59	1.65		99.00	
Roundabout at Etheldore									14.00	
										33.80
So. Moss	No. Airport									
34.85	34.45	0.4	2,112	50		73	0.48	28.80		
34.85	34.45	0.4	2,112		45	66	0.53		32.00	
Roundabout at Cypress									16.00	
										19.20
No. Airport	So. Airport									
34.45	33.95	0.5	2,640	55		81	0.55	32.73		
34.45	33.95	0.5	2,640		55	81	0.55		32.73	
										0.00
So. Airport	Capistrano/Obispo									
33.95	33.361	0.589	3,110	50		73	0.71	42.41		
33.95	33.361	0.589	3,110		45	66	0.79		47.12	
										4.71
Capistrano/Obispo	Cortez									
33.361	31.96	1.401	7,397	50		73	1.68	100.87		
33.361	31.96	1.401	7,397		40	59	2.10		126.09	
										25.22
Cortez	Frenchmens Creek									
31.96	30.225	1.735	9,161	45		66	2.31	138.80		
31.96	30.225	1.735	9,161		40	59	2.60		156.15	
										17.35
	Total Time (secs)							513.21	624.79	111.58
	Total Time (mins)							**8 : 33**	**10 : 25**	**1 : 51**
								min : secs	min : secs	min : secs

Capacity Analysis: Roundabout at Cypress Avenue, Moss Beach

MOVEMENT SUMMARY

Site: HW1@Cypress (PM) - HCM 2010

Highway 1 at Cypress
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Highway 1											
3	L	35	3.0	0.725	15.8	LOS C	6.9	175.8	0.47	0.82	23.3
8	T	696	3.0	0.725	15.8	LOS C	6.9	175.8	0.47	0.50	25.9
18	R	11	3.0	0.725	15.8	LOS C	6.9	175.8	0.47	0.58	24.8
Approach		741	3.0	0.725	15.8	LOS C	6.9	175.8	0.47	0.52	25.7
East: Cypress											
1	L	11	3.0	0.027	7.7	LOS A	0.1	2.1	0.57	0.83	21.2
6	T	1	3.0	0.027	7.7	LOS A	0.1	2.1	0.57	0.54	20.8
16	R	1	3.0	0.027	7.7	LOS A	0.1	2.1	0.57	0.66	21.7
Approach		13	3.0	0.027	7.7	LOS A	0.1	2.1	0.57	0.79	21.2
North: Highway 1											
7	L	7	3.0	0.648	12.8	LOS B	5.3	135.0	0.33	0.88	23.4
4	T	602	3.0	0.648	12.8	LOS B	5.3	135.0	0.33	0.47	26.7
14	R	68	3.0	0.648	12.8	LOS B	5.3	135.0	0.33	0.52	25.1
Approach		677	3.0	0.648	12.8	LOS B	5.3	135.0	0.33	0.47	26.5
West: Cypress											
5	L	55	3.0	0.152	8.1	LOS A	0.5	13.1	0.55	0.88	20.6
2	T	7	3.0	0.152	8.1	LOS A	0.5	13.1	0.55	0.57	20.8
12	R	26	3.0	0.152	8.1	LOS A	0.5	13.1	0.55	0.71	22.1
Approach		88	3.0	0.152	8.1	LOS A	0.5	13.1	0.55	0.81	21.1
All Vehicles		1520	3.0	0.725	13.9	LOS B	6.9	175.8	0.41	0.52	25.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION 5.1.6.2039
Project: H:\Projects - Open\S-Z\SAN MATEO COUNTY Midcoast Hwy 1 Study 10640\06. Data Analysis & Spreadsheets\Traffic Analysis\San Mateo.sip
8001255, NELSON NYGAARD CONSULTING ASSOCIATES, SINGLE

SIDRA INTERSECTION

The summary above shows a single-lane roundabout operating well for all directions at Cypress Avenue in Moss Beach.

Capacity Analysis: Roundabout at Capistrano Road/Alhambra Avenue, El Granada
Single Lane Roundabout (using Highway Capacity Manual Methodology)

MOVEMENT SUMMARY

Site: HW1@Capistrano (PM) - HCM 2010

Highway 1 at Capistrano
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Highway 1											
3	L	198	3.0	1.050	66.9	LOS F	39.0	998.9	1.00	1.76	12.0
8	T	617	3.0	1.050	66.9	LOS F	39.0	998.9	1.00	1.76	12.8
18	R	65	3.0	1.050	66.9	LOS F	39.0	998.9	1.00	1.76	11.8
Approach		880	3.0	1.050	66.9	LOS F	39.0	998.9	1.00	1.76	12.6
East: Capistrano											
1	L	66	3.0	0.464	16.4	LOS C	2.0	51.2	0.71	1.04	18.6
6	T	74	3.0	0.464	16.4	LOS C	2.0	51.2	0.71	0.80	18.2
16	R	78	3.0	0.464	16.4	LOS C	2.0	51.2	0.71	0.90	19.2
Approach		218	3.0	0.464	16.4	LOS C	2.0	51.2	0.71	0.91	18.7
North: Highway 1											
7	L	137	3.0	0.806	24.8	LOS C	8.7	223.6	0.87	1.12	19.6
4	T	467	3.0	0.806	24.8	LOS C	8.7	223.6	0.87	1.05	21.2
14	R	26	3.0	0.806	24.8	LOS C	8.7	223.6	0.87	1.06	20.1
Approach		630	3.0	0.806	24.8	LOS C	8.7	223.6	0.87	1.07	20.8
West: Capistrano											
5	L	46	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	1.08	18.3
2	T	78	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	0.85	17.9
12	R	188	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	0.94	18.9
Approach		312	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	0.94	18.6
All Vehicles		2041	3.0	1.050	41.0	LOS E	39.0	998.9	0.89	1.33	15.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

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SIDRA INTERSECTION 5.1.6.2039
Project: H:\Projects - Open\S-Z\SAN MATEO COUNTY Midcoast Hwy 1 Study 10640\06. Data Analysis & Spreadsheets\Traffic Analysis\San Mateo.sip
8001255, NELSON NYGAARD CONSULTING ASSOCIATES, SINGLE

SIDRA INTERSECTION

The summary above shows a single-lane roundabout operating well for all directions at Capistrano Road in El Granada except for northbound traffic on Highway 1. However, the methodolgy used to calculate performance is conservative and may overestimate the level of the delay that would occur during the PM peak volume hour. An analysis using the same software with methodology approved in Australia, a country with a longer history of widespread use of roundabouts compared to the United States, shows all legs operating with a C Level of Service or better.

Capacity Analysis: Roundabout at Capistrano Road/Alhambra Avenue, El Granada
Single Lane Roundabout (using Standard Methodology)

MOVEMENT SUMMARY

Site: HW1@Capistrano (PM)

Highway 1 at Capistrano
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Highway 1											
3	L	198	3.0	0.952	30.4	LOS C	28.1	720.6	1.00	1.22	20.9
8	T	617	3.0	0.952	26.0	LOS C	28.1	720.6	1.00	1.22	22.5
18	R	65	3.0	0.952	26.1	LOS C	28.1	720.6	1.00	1.22	21.6
Approach		880	3.0	0.952	27.0	LOS C	28.1	720.6	1.00	1.22	22.1
East: Capistrano											
1	L	66	3.0	0.619	27.3	LOS C	5.6	142.6	1.00	1.19	18.3
6	T	74	3.0	0.619	18.5	LOS B	5.6	142.6	1.00	1.19	17.6
16	R	78	3.0	0.619	21.4	LOS C	5.6	142.6	1.00	1.19	18.7
Approach		218	3.0	0.619	22.2	LOS C	5.6	142.6	1.00	1.19	18.2
North: Highway 1											
7	L	137	3.0	0.782	19.8	LOS B	11.5	294.6	0.97	1.05	25.2
4	T	467	3.0	0.782	15.4	LOS B	11.5	294.6	0.97	1.03	27.3
14	R	26	3.0	0.782	15.5	LOS B	11.5	294.6	0.97	1.03	26.7
Approach		630	3.0	0.782	16.3	LOS B	11.5	294.6	0.97	1.03	26.8
West: Capistrano											
5	L	46	3.0	0.634	22.1	LOS C	6.1	156.0	0.97	1.18	19.6
2	T	78	3.0	0.634	13.3	LOS B	6.1	156.0	0.97	1.16	19.1
12	R	188	3.0	0.634	16.2	LOS B	6.1	156.0	0.97	1.17	20.2
Approach		312	3.0	0.634	16.4	LOS B	6.1	156.0	0.97	1.17	19.8
All Vehicles		2041	3.0	0.952	21.6	LOS C	28.1	720.6	0.99	1.15	22.4

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

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SIDRA INTERSECTION 5.1.5.2006
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UNLICENSED TRIAL VERSION

SIDRA INTERSECTION

The summary above shows a single-lane roundabout operating well for all directions at Capistrano Road in El Granada based on alternative methodology used in Australia, a country with a longer history of widespread use of roundabouts compared to the United States.

Capacity Analysis: Roundabout at Capistrano Road/Alhambra Avenue, El Granada
2 Lanes Northbound Direction Only

MOVEMENT SUMMARY

Site: HW1@Capistrano (PM) - HCM 2010 - 2 lanes NB only

Highway 1 at Capistrano
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Highway 1											
3	L	198	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.88	23.9
8	T	617	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.69	26.7
18	R	65	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.75	25.8
Approach		880	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.74	26.0
East: Capistrano											
1	L	66	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.96	19.8
6	T	74	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.62	19.8
16	R	78	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.76	20.6
Approach		218	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.78	20.1
North: Highway 1											
7	L	137	3.0	0.814	25.6	LOS D	9.0	229.3	0.88	1.14	19.3
4	T	467	3.0	0.814	25.6	LOS D	9.0	229.3	0.88	1.08	20.9
14	R	26	3.0	0.814	25.6	LOS D	9.0	229.3	0.88	1.09	19.8
Approach		630	3.0	0.814	25.6	LOS D	9.0	229.3	0.88	1.09	20.5
West: Capistrano											
5	L	46	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	1.08	18.3
2	T	78	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	0.85	17.9
12	R	188	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	0.94	18.9
Approach		312	3.0	0.567	17.6	LOS C	3.0	75.8	0.73	0.94	18.6
All Vehicles		2041	3.0	0.814	16.8	LOS C	9.0	229.3	0.69	0.88	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

The summary above shows the impact of adding a second lane in the northbound direction.

Capacity Analysis: Roundabout at Capistrano Road/Alhambra Avenue, El Granada
2 Lanes Northbound and Southbound Direction

MOVEMENT SUMMARY

Site: HW1@Capistrano (PM) - HCM 2010 - 2/1 lanes

Highway 1 at Capistrano
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Highway 1											
3	L	198	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.88	23.9
8	T	617	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.69	26.7
18	R	65	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.75	25.8
Approach		880	3.0	0.525	11.6	LOS B	3.0	75.9	0.56	0.74	26.0
East: Capistrano											
1	L	66	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.96	19.8
6	T	74	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.62	19.8
16	R	78	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.76	20.6
Approach		218	3.0	0.370	11.5	LOS B	1.2	30.0	0.57	0.78	20.1
North: Highway 1											
7	L	137	3.0	0.407	9.8	LOS A	1.8	46.5	0.54	0.91	24.7
4	T	467	3.0	0.407	9.8	LOS A	1.8	46.5	0.54	0.70	27.7
14	R	26	3.0	0.407	9.8	LOS A	1.8	46.5	0.54	0.77	26.8
Approach		630	3.0	0.407	9.8	LOS A	1.8	46.5	0.54	0.75	26.9
West: Capistrano											
5	L	46	3.0	0.461	12.1	LOS B	1.7	43.3	0.56	0.98	19.6
2	T	78	3.0	0.461	12.1	LOS B	1.7	43.3	0.56	0.62	19.6
12	R	188	3.0	0.461	12.1	LOS B	1.7	43.3	0.56	0.76	20.4
Approach		312	3.0	0.461	12.1	LOS B	1.7	43.3	0.56	0.76	20.1
All Vehicles		2041	3.0	0.525	11.1	LOS B	3.0	75.9	0.55	0.75	24.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

The summary above shows the impact of adding a second lane in both directions on Highway 1.

Capacity Analysis: Roundabout at Capistrano Road/Alhambra Avenue, El Granada
2 Lanes Northbound and Southbound Direction with Eastbound Right Turn Lane with Cumulative Buildout of Proposed Development

MOVEMENT SUMMARY

Site: HW1@Capistrano (PM Cumulative Big Wave) - HCM 2010 - 2 lanes NB and SB

Highway 1 at Capistrano
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Highway 1											
3	L	395	3.0	0.835	29.4	LOS D	9.1	232.0	0.91	1.18	18.0
8	T	721	3.0	0.835	29.4	LOS D	9.1	232.0	0.91	1.15	19.8
18	R	73	3.0	0.835	29.4	LOS D	9.1	232.0	0.91	1.16	18.8
Approach		1188	3.0	0.835	29.4	LOS D	9.1	232.0	0.91	1.16	19.1
East: Capistrano											
1	L	72	3.0	0.656	24.9	LOS C	2.7	68.5	0.79	1.12	16.8
6	T	137	3.0	0.656	24.9	LOS C	2.7	68.5	0.79	0.95	16.2
16	R	91	3.0	0.656	24.9	LOS C	2.7	68.5	0.79	1.02	17.2
Approach		300	3.0	0.656	24.9	LOS C	2.7	68.5	0.79	1.01	16.6
North: Highway 1											
7	L	162	3.0	0.674	21.2	LOS C	4.3	110.6	0.78	1.09	20.5
4	T	540	3.0	0.674	21.2	LOS C	4.3	110.6	0.78	0.99	22.4
14	R	92	3.0	0.674	21.2	LOS C	4.3	110.6	0.78	1.02	21.5
Approach		795	3.0	0.674	21.2	LOS C	4.3	110.6	0.78	1.01	21.9
West: Capistrano											
5	L	98	3.0	0.429	12.5	LOS B	1.5	39.4	0.59	1.00	19.6
2	T	161	3.0	0.429	12.5	LOS B	1.5	39.4	0.59	0.66	19.5
12	R	478	3.0	0.762	25.5	LOS D	4.4	112.7	0.75	1.03	16.9
Approach		737	3.0	0.762	20.9	LOS C	4.4	112.7	0.69	0.94	17.7
All Vehicles		3020	3.0	0.835	24.7	LOS C	9.1	232.0	0.81	1.05	19.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

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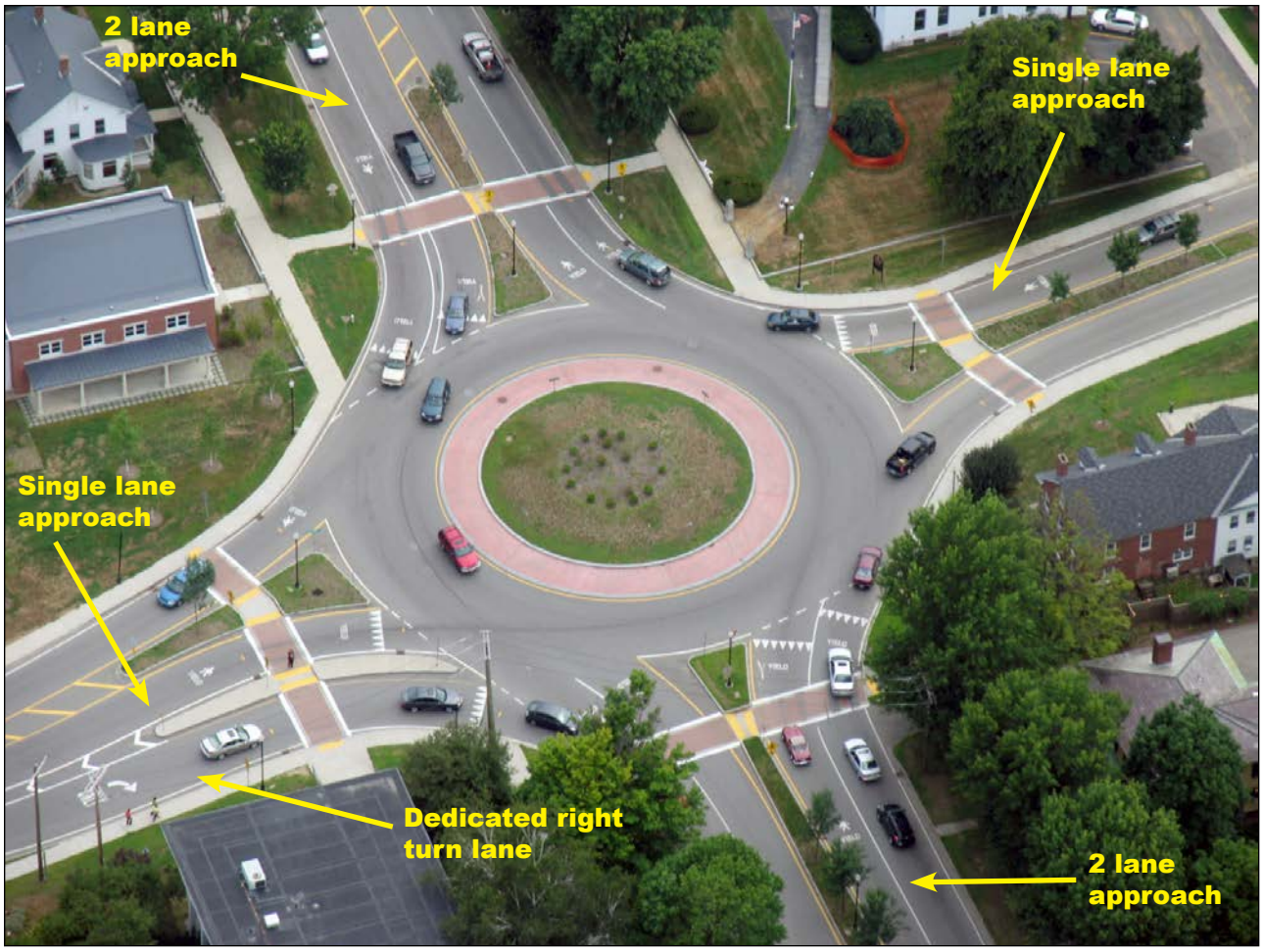
SIDRA INTERSECTION 5.1.6.2039

Project: H:\Projects - Open\S-Z\SAN MATEO COUNTY Midcoast Hwy 1 Study 10640\06. Data Analysis & Spreadsheets\Traffic Analysis\San Mateo.sip
8001255, NELSON NYGAARD CONSULTING ASSOCIATES, SINGLE

SIDRA INTERSECTION

The table above summarizes the roundabout performance under buildout conditions of the proposed Big Wave Development project. The addition of a dedicated eastbound right hand turn lane off of Capistrano Road would handle the increased volume of right turning vehicles from Capistrano Road onto southbound Highway 1 during the peak PM hour.

Example of 2/1 Roundabout



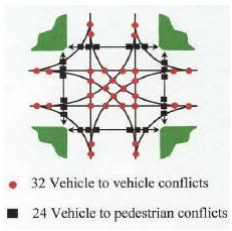
Example of a 2/1 lane roundabout with one dedicated right turn lane in Keene City, New Hampshire. Photo source: New Hampshire Department of Transportation: www.nh.gov/dot/org/projectdevelopment/highwaydesign/roundabouts/index.htm

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

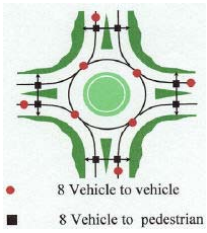
ROUNDABOUT INFORMATION

WHAT ARE THE BENEFITS OF A ROUNDABOUT ??

Possible Conflict Points: Roundabout vs. 4 Way Intersection



4 –Way Intersection



Roundabout

Safety – There are fewer conflict points where vehicles can get into an accident in a roundabout as opposed to a 4-way intersection. This combined with the slower speed of vehicles in a roundabout make them very safe.

SAFETY BENEFITS OF ROUNDABOUTS VS. OTHER TYPES OF INTERSECTIONS

- •90% Fewer Fatalities
- •75% Fewer Injury Accidents
- •35% Fewer Accidents
- •35% Fewer Pedestrian Accidents
- •10% Fewer Bicycle Accidents

Ref.: FHWA Study

Capacity – Because of the free flow nature of a roundabout, the slower speeds and closer vehicles tend to travel through roundabouts, more vehicles can go through a roundabout. Studies show that a roundabout can process about 30% more traffic than other types of intersections.

Aesthetics – The central island of the roundabout provides a location where landscaping can be placed. This landscaping can beautify the area and provide a gateway treatment to the community

Less pollution – Because vehicles are moving slowly and not stopping and starting like at other types of intersections vehicles will use less gas and emit less pollution into the environment.

U-Turns – Roundabouts provide access to all approaches and also make U-Turns easy and convenient. All vehicles, including tractor trailers can make U-Turns at a roundabout.

Above factsheet available at: www.nh.gov/dot/org/projectdevelopment/highwaydesign/roundabouts/index.htm

ROUNDABOUT INFORMATION

HOW DO BICYCLISTS AND PEDESTRIANS GET THROUGH A ROUNDABOUT??

Bicyclists have a choice when they are approaching a roundabout. They can "claim a lane" and travel through the roundabout as a vehicle. Or they can use the sidewalk ramp located at each approach to the roundabout, then they can go through the roundabout using the sidewalks and crosswalks as a pedestrian.

These bicyclists have "claimed a lane" and entered the roundabout as a vehicle. Because of the slower vehicle speeds in a roundabout bicyclists can easily match vehicle speeds through the roundabout

For those bicyclists that are inexperienced or uncomfortable traveling through the roundabout as a vehicle, sidewalk ramps are provided at each approach. Bicyclists simply use the ramps to gain access to the sidewalks and then proceed through the roundabout as a pedestrian, once through the roundabout they can continue riding in the shoulder.

Pedestrians are provided sidewalks around the roundabout and crosswalks at all approaches to the roundabout. The crosswalks are placed so only one lane of travel has to be crossed at a time, with the splitter island acting as a refuge.

The splitter islands offer a refuge for pedestrians so they only have to cross one lane at a time.

State law requires all vehicles to yield to pedestrians in a crosswalk, but pedestrians should always use caution when using crosswalks.

Above factsheet available at: www.nh.gov/dot/org/projectdevelopment/highwaydesign/roundabouts/index.htm

ROUNDABOUT INFORMATION

CAN ROUNDABOUTS ACCOMMODATE ALL TYPES OF VEHICLES??

Nashua – Main Street

Roundabouts are designed so school buses can traverse the circulating roadway without going onto the rough truck apron.

Nashua – NH 130

The truck apron (gray cobbles in above picture) is specially designed to be used by large trucks. The truck apron is usually made of a different material to keep cars off but not prohibit trucks from using it. Sometimes the truck apron is slightly raised to further deter cars from using it.

Nashua – Main Street

Obviously, passenger vehicles are the main vehicle used in the design of a roundabout since they represent the majority vehicle on our road system.

Hanover – NH 10

The truck apron (yellow portion in above picture) is specially designed to be used by large trucks. The truck apron is usually made of a different material to keep cars off but not prohibit trucks from using it. Sometimes the truck apron is slightly raised to further deter cars from using it.

Meredith – US 3/NH106

Motorcycles can also easily navigate through a roundabout.

ANY VEHICLE ALLOWED ON THE ROAD CAN BE ACCOMODATED THROUGH THE ROUNDABOUT

Above factsheet available at: www.nh.gov/dot/org/projectdevelopment/highwaydesign/roundabouts/index.htm

Outreach Materials

Traffic & Trails:
Help Plan the Future

Highway 1 Safety and Mobility Improvement Study

- Explore solutions for pedestrians, bicyclists and motorists
- Develop strategies to manage traffic speed and parking
- Help identify opportunities for safe crossings and community trails

A Community Workshop Series

Walkable Communities expert Dan Burden and an experienced community design and transportation planning team will translate your input into a plan to improve safety and mobility along and across Highway 1.

The focus will be on the highway corridor and surrounding lands and communities from Moss Beach through Devil's Slide.

Local Government Commission

Organized by San Mateo County and the Local Government Commission with funding from a Caltrans Transportation Planning Grant.

Kickoff Community Meeting
Thursday, April 28 7:00-9:00 p.m.
El Granada Elementary School
400 Santiago St., El Granada

Community Design Day
Saturday, April 30 9:00 a.m.-2:00 p.m.
Farallone View Elementary School
1100 LeConte, Montara

Presentation of Plan Concepts
Thursday, May 26 7:00-9:00 p.m.
El Granada Elementary School
400 Santiago St., El Granada

- Food and refreshments provided at all events.

For more information:
Matt Jacobs, San Mateo County
(650) 363-4528, mjacobs@co.sanmateo.ca.us
www.co.sanmateo.ca.us/planning/midcoasthighway1

Tráfico y Veredas:
Ayude a Planear el Futuro

Estudio para mejorar la seguridad y circulación en la Carretera 1

- Ayude a explorar soluciones para peatones, ciclistas y conductores
- Ayude a preparar estrategias para controlar la velocidad de carros y manejar cómo y donde se estacionan
- Ayude a identificar oportunidades para cruces seguros y veredas para la comunidad

Serie de Talleres de la Comunidad

El experto en comunidades caminables, Dan Burden, y un equipo con experiencia en el diseño de comunidades y la planeación del transporte tomarán sus ideas para crear un plan para mejorar la seguridad y circulación a lo largo de la Carretera 1.

El área de enfoque es la sección desde Moss Beach hasta el túnel en Devil's Slide.

Local Government Commission

Organizado por el Condado de San Mateo y la Local Government Commission con una subvención para planeación del Departamento de Transporte (Caltrans).

Reunión de Apertura de la Comunidad
Jueves 28 de abril de 7 a 9 de la noche
Escuela primaria El Granada
400 Santiago Street, El Granada

Día de Diseño de la Comunidad
Sabado 30 de abril de 9am a 2 de la tarde
Escuela primaria Farallone View
1100 LeConte, Montara

Presentación de Conceptos Para el Plan
Jueves 26 de mayo de 7 a 9 de la noche
Escuela primaria El Granada
400 Santiago Street, El Granada

- Se servirán botanas en todos los eventos.

Para más información comuníquese con:
Matt Jacobs, Condado de San Mateo
(650) 363-4528, mjacobs@co.sanmateo.ca.us
www.co.sanmateo.ca.us/planning/midcoasthighway1

Traffic & Trails:
What Would You Do?

Improve safety and mobility along Highway 1

Explore solutions for pedestrians, bicyclists and motorists

A community workshop series
April 28 ➠ April 30 ➠ May 26

Traffic & Trails:
What Would You Do?

Work with walkable communities expert Dan Burden and an experienced design team to create a plan that improves safety and mobility along and across Highway 1. The focus will be on the highway corridor and surrounding lands and communities from Moss Beach to Devil's Slide.

- **Kickoff Community Meeting**
  Thursday, April 28 7:00-9:00 p.m.
  El Granada Elementary School • 400 Santiago St., El Granada
- **Community Design Day**
  Saturday, April 30 9:00 a.m.-2:00 p.m.
  Farallone View Elementary School • 1100 LeConte, Montara
- **Presentation of Plan Concepts**
  Thursday, May 26 7:00-9:00 p.m.
  El Granada Elementary School • 400 Santiago St., El Granada

- Food and refreshments provided at all events.

Organized by San Mateo County and the Local Government Commission with funding from Caltrans.

For more info: Matt Jacobs, San Mateo County
mjacobs@co.sanmateo.ca.us, (650) 363-4528
www.co.sanmateo.ca.us/planning/midcoasthighway1

Focus Meeting Notes

Agencies and Districts
April 28, 2011
9:00 – 10:30 am

Attendees:

Gail Erickson, Granada Sanitary District
Leonardn Woren, Midcoast Community Council
Sam Herzberg, San Mateo County Parks Dept.
Jim Wadleson, San Mateo County Airports
Bill Kehoe, Midcoast Community Council
Sabrina Brennan, Coastside Bicycle Coalition
Neil Merrilees, San Mateo County Parks Commission
Matt Jacobs, SMC, CMU
Kathryn Slater, MWSD
Joseph Hurley, SM County Transportation Authority
Paul Perkovic, Montara Water and Sanitary District
Nick Dreher, Coastal Commission
Ruby Pap, Coastal Commission
Steve Monowitz, San Mateo County Planning Dept.
Joe Lococo, San Mateo County Public Works

Shani Alford, LGC
Josh Meyer, LGC
Paul Zykofsky, LGC
Michael Moule, Nelson Nygaard
Kevin Shively, Nelson Nygaard
John Miki, Opticos Design
Stefan Pellegrini, Opticos Design

Notes

What would you most want to achieve through this project?

This effort will lead to specific ideas and proposals that will be feasible to implement given regulatory context we're operating under. Needs to be consistent with the local coastal program and Coastal Act. Must be careful about areas subject to erosion and sensitive habitats. Should also think about the effort to create a continuous coastal trail from Oregon to Mexico, which can have many components and alignments. Also, the County is in the process of updating the Local Coastal Program. There is a lot of concern over traffic and how to deal with it. The County has committed to a developing coastal traffic management plan. We would like the outcome of this project to be consistent with long term county planning. The traffic management plan hasn't been started. We will be updating the countywide transportation plan, and C/CAG is working on a comprehensive bicycle and pedestrian plan.

The County Congestion Management Program indicates that some roads are at capacity. It was worse when the economy was booming. But traffic is expected to increase on the midcoast.

The project should focus on urban areas in Montara and Moss Beach. As people head north from Half Moon Bay after passing El Granada motorists accelerate by the airport straightaway and motorists accelerate the same at the south end of Moss Beach. The problem is bigger in Moss Beach because there is population on both sides of the highway. This creates very dangerous turning maneuvers. There is a need to slow down traffic. We have seen a significant number of pedestrian and bike crashes over the years.

There are days when it's very easy to access the coast. But there are special events when the area is totally saturated and there's total gridlock. This Sunday there's the Pacific Dream Machine event. You'll see parking on both sides of Hwy 1 so you'll see people walking on the highway.

Pedestrian crashes have occurred at 14th Street and 16th Street in Montara. There was a crash with a car turning into the lighthouse hostel. At Carlos Street to get to Moss Beach, cars that are making lefts are stopped in lane. Also, equestrians ride throughout this area.

Concerned about what the population here really is. We've been asking for a count on second units for decades. There are many second units occupied by folks with second cars. There are many houses in Montara with 4-5 cars. We have a lot of second units or multiple families sharing a single house. This is a hidden problem that does impact traffic. Another major concern is safety and the speed limit. Some people are very concerned that the coastal trail would be put on the edge of the coast where users would have access to front and back yards. Before decisions are made it would be good to make some overlays of the existing situation. There's been a lot of erosion this year. There is a need to make accommodations for pedestrians. There is no safe way for children to get to ocean due to high speeds on the highway. There is a need to make locations for pedestrian crossings. The reason for having a trail on the east side of the highway is becauase that is where most people live. People want a multimodal trail with better visibility at night/evenings. There is a need for lighting and security. There is interest in transportation as well as recreational aspects of trails, the different functions and user groups. It is important to differentiate between the two.

There is a problem with gridlock on Hwy 1, on the weekends, not just during special events. Getting around by bicycle is only way to get around. If you have a mountain bike you can get around but if not you're stuck in your house. When people know it is going to be a busy weekend, locals provision up on Friday and don't leave their house until Monday.

It is necessary to be aware of the Rancho Corral de Tierra property becoming a part of the national park system. This will bring more people into the area and a need for parking at trailheads. Some have recommended parking on the west side of the highway but with erosion that might not work. Might need to put parking on the east side. Also, need to think about restroom facilities with parking and crossings so folks can get where they need to go. And also need interconnecting other trails. Need to think the whole system through so it is not piecemealed.

If the County is taking action to deal with the coastal trail I would like to see them deal with problems in Princeton. It's a mess. Runoff into harbor, no place for people to walk or ride through the streets. Signing the route isn't enough.

The County should not miss the application deadline for Measure A funding for the parallel trail. Would like assurance from County that we aren't going to miss next application deadline. The City of Half Moon Bay has done a lot in past but county segment hasn't moved forward.

C/CAG has been working with the cities to put together a bicycle plan for all of the County. It is out for comments in draft form. There is no discussion about the parallel trail, pedestrian crossings, etc. These are important trails. The County needs to provide constructive input to C/CAG on the plan.

There is a need to ensure a safe crossing at Devil's Slide. Right now the project is close to finished and having an at-grade crossing near the mouth of the tunnel is dangerous.

There are many traffic problems on the midcoast and I don't think this study will solve all these. If there were school bus service we would reduce traffic. This could cut morning traffic significantly. It is difficult to get trails approved in this area. No one wants trails through their back yards. All trail segments have been controversial and have taken years to develop. The best thing that can come out of this charrette is safe pedestrian crossings. It is very difficult for children to get to the ocean.

At Devil's Slide, with traffic coming out of the tunnel, speeds will be high because it's a straight shot. Cars may be going faster throughout the corridor. GGNRA has been working on access to open space and trails. They want to use just two trails for access but as they start to publicize to the Bay Area and the country that's going to be problematic for neighborhoods. Would like trail access closer to Hwy 1 so folks aren't driving through neighborhoods. Where do you put parking lots? The best places are where you have best coastal views. From a transportation standopoint we have left/right turning issues.

We are looking at 700 more cars if the Big Wave development goes through. 700 more cars will be added to the LOS F traffic commute time. It will also create problems at the tunnel.

The County road standards were developed some years ago with community input but might require a revisit. For example, as the coastal trail winds through Princeton there might be the need to put in sidewalks. But they are not in the standards. Also the first phase study looked at the frontage road on the east side in Moss Beach and Miramar. If there's a road connection within communities these should be considered. In communities to the north of Half Moon Bay the mulitmodal trail should be on the east side. In HMB it is okay to be on the west side. It is important to consider different uses of a trail. The Midcoast Parks and Recreation Committee looked at where the coastal trail should go and some preliminary ideas have been developed but we are still having dialogue. The California Coastal Trail could run on the west side within the midcoast but again has to cross over to east side in places.

We would like to find a way to do improved crossings without relying on a traffic signal. The Phase 1 study proposed roundabouts but some folks in El Granada don't like them. Maybe look at Michigan left turns. If separated, two traffic lanes create safer crossing because pedestrians only have to cross one lane of traffic at a time. As far as trails go, there are supposed to be 2 different trails: the coastal trail and the multimodal trail. The latter is for transportation. The coastal trail is to enjoy the coast. Don't want transportation uses to overwhelm the coastal trail. Regarding El Granada, erosion at Surfer's beach is manmade. Have to fix the breakwater and then it won't be necessary to move the highway. We would like to keep the Burnham strip as a park and not for parking.

Need to look at public transportation. Better transit would reduce traffic. Traffic to schools in morning is very bad. Transit has potential but isn't used enough. Very difficult to get around with public transportation. Users are generally too young to drive or too old to drive or don't own a

car. Many are Hispanic. It would be good to try to get them involved more. My experience is you see a lot of empty buses during the middle of day, used mostly by seniors. On weekends when traffic is very bad there's less transit. There is almost no weekend bus service. There are also conflicts between commuter bicyclists and recreational bicyclists. You see similar issues here.

Public Works is concerned about circulation and access. We maintain local roads and if there are opportunities to improve the corridor and make those intersections safer that's something we'd like to look at. 2 examples: Medio and Mirada Road. Where they meet Hwy 1 the sight distance is poor. We would look at opportunities for enhancements to solve problems like these.

There are only 2 ways in and out of El Granada. Driving through Moss Beach we need the frontage road to focus traffic to 2-3 cross streets. The same in Miramar. But need to make sure that the frontage road isn't used as bypass by highway through traffic.

Frustration in getting Coastal Trail through Princeton. The Parks Department was receptive to input for a safe place for a trail through Princeton. Princeton has plans to rebuild a road, but with no sidewalks or bike lanes. When Parks tried to work with Public Works on the road where Coastal trail accommodation was needed it didn't work out because of the road standards adopted by the community. May need to revisit that standard.

We have a Mid Coast Community Council that tries to address issues. But coordination with the Couty hasn't been working well for the past 10 years or so. The County needs to work through the MCC. Have a forum and have the ability to handle these issues better.

Driving out in Moss Beach a lot of times you will see 3 turns being made simultenously on to Hwy 1 and that will slow down people getting in or out of cthe ommunity. The fact that there are multiple points of access helps. Most people are comfortable with the concept of what the community is but the bigger issue is how to maintain community character with a growing population. Most people in Montara walk on the side of road comfortably. But traffic sped up when potholes were repaired.

CCAG bicycle plan. What is timeline?
The deadline for comments passed. But C/CAG has been willing to give more time but needs the input as soon as possible. We need to analyze and come up with comments that correspond to this project.

How much of congestion is caused by parking?
No public parking from Devil's Slide south along the corridor. There is very little parking so cars park on the side of the road. No parking signs get taken down or people get tickets. The critical issue is where to put in adequate parking. GGNRA wants to put parking at the back of neighborhoods where people don't want them. There is no specific study on traffic congestion in the Midcoast.

Parks, Trails and Open Space
April 28, 2011
11:00 am – noon

Attendees:
Paul Ringgold, Peninsula Open Space Trust
Meghan Scanlon, POST
Len Erickson, MPL, MPRC, MCC
Matt Jacobs, County Managers Office
Nicholas Calderon, Supervisor John Horsley's office
Bill Kehoe, Midcoast Community Council
Sabrina Brennan, Coastside Bicycle Coalition
Kathryn Slater-Carter, MWSD
Sam Herzberg, San Mateo County Parks Dept.
Steve Monowitz, San Mateo County Planning Department
Gail Erickson, GSD
Nancy Hornor, National Park Service/GGNRA
Paul Perkovic, MWSD
Shani Alford, LGC
Josh Meyer, LGC
Paul Zykofsky, LGC
Michael Moule, Nelson Nygaard
Kevin Shively, Nelson Nygaard
John Miki, Opticos Design
Stefan Pellegrini, Opticos Design

Notes

What would you most want to achieve through this project?

Land that POST controls is slated to be handed over to the National Parks Service. POST's role was in protection of property and acquiring it. We've been engaged with the community on managing that land. The Parks Service will have the final say on future management of that land. We will continue to control agricultural lands, and fields across from Montara State Beach. It is held for protection of agricultural heritage and we intend to transfer it to a private farmer. Need to ensure that there is adequate access to a variety of satellite and adjacent spaces in the area. In addition to Rancho Corral de Tierra also POST owns Pillar Point bluff property on the other side of highway. It is currently open to the public as part of the California Coastal Trail but close to transferring to the County.

There are a variety of users including equestrians and informal biking. There are quite a few footpaths that other trailowners have used. Trail activity could change with GGNRA ownership.

Quarry Park and Wicklow Park make a critical connection up to GGNRA. Wicklow is somewhat fallow but provides trail potential as a connection up to Rancho Corral de Tierra. It could provide a place to park and go up to GGNRA. Further north, the ag lands that POST mentioned could raise issues with access to Rancho. But those fields might be able to be used for access.

The Coastal Trail from the harbor north to Devil's Slide is a real challenge. A complete trail would force people to cross the highway at several points. All are contentious. There is no property on the west side of

the highway. It is difficult to cross. If you stay on the east side you have to get by ag lands or come back to the west side at the restaurant that has a lot of parking. Past Montara State Beach there is little parking and the need to cross back to east side. As you reach Grey Whale Cove you have a challenging place to cross. Then the crossing at Devil's Slide is challenging.

There are issues with POST and MCC over location of trailheads. Fallow agricultural land may provide an opportunity. The problem is concern over impacts on one of the most spectacular view sheds. Waiting for turnover to National Parks Service to continue the dialogue. Need something accessible from the highway and possibly to a parking lot and interpretive corridor that's not on a view corridor. There is a need for access into Rancho Corral in a way that doesn't spoil ocean views but is close to trailheads. Those are things to address.

The Midcoast Parks and Recreation Committee put together a trail plan and have put together some ideas for potential alignments. Should add to the discussion the Green Valley trail. The Devil's Slide section of the highway is supposed to transfer to the County but when it gets blocked by falling rocks we will need to look at Green Valley Trail all the way to Pacifica.

Rancho when acquired will be the southernmost part of GGNRA. Pedro Point headlands is expected to come in the next 2 years. There is interest in safe, multimodal access all along the corridor that connects all park sites. Need safe connections to communities and better balance between vehicles and bicyclists and pedestrians. This community process is to address these issues. Need to make safe left turns and left turn pockets. Park Service is working on a general management plan for park looking at lands south of Bolinas and including Rancho. The area will continue to serve equestrians and be a low key destination for hiking and trail experiences for folks that want a challenging hike. Visitor facilities would be in the general location of existing equestrian facilities, off of Etheldore Street and McNee Ranch State Park.

Dog owner and horse owner groups are opposed to anything that gets in way of their operations. Trailheads should be as close to Hwy 1 as possible. As soon as trailheads are on the GGNRA web site they will become a big draw. The best access would be from Hwy 1. Visitors don't know how to get around this community so should try to find a way to put trailheads on Hwy 1, in El Granada, Moss Beach and Montara, with parking and restroom facilities at those sites. Currently people only know Hwy 1 and stop at Sam's restaurant but not other places. Make sure that visitors can find and use those sites. But don't want huge parking lots. Need to have trees masking parking lots, etc.

We do see potential on the northern Rancho property. We don't want to create people parking on the beach side and crossing the highway and vice versa. Should plan for adequate parking for folks going to beach and the same on the east side. Or we need to put in a safe crossing. We haven't gotten into analyzing sight distance. But the highway is a pretty straight stretch along Rancho.

There is one section where the farmer doesn't farm that could that be an option for access. POST has confirmed that that piece is no longer of interest to the farmer. There is no longer a need to dedicate it to farming but no decisions have been made about other uses. Parking there wouldn't conflict with beach parking on the west side.

Equestrian users have concerns about traffic going through there. Horseowners have concerns. Same concern from the farmer. Wherever parking is sited, travelers will need to make left turns and will need a left turn lane in areas where speeds are high.

It is important to understand that there are 2 pieces of farm land, the one next to airport that is viable and the one to the north, with a section that is fallow.

There is a challenge with access through Moss Beach Park. There is a narrow dirt road with a ditch that isn't safe. San Vicente Creek drains through the area and there is a water quality problem there. If a lot of visitor activity is compacted there will need to be assurance that there is a good drainage plan for that area.

The Coastal Commission designated this area as a critical coastal area and looking at existing drainages so when talking about parking in that area need to look at that information. San Vicente Creek drains into an estuary. Pollutants going into the creek will impact those areas.

Another piece of the puzzle is the Caltrans bypass land. The County has been working with Coastal Commission and Caltrans for plan for that bypass and in the LCP update is proposing for a specific plan to be developed to look closely at this area for best places for trails, parks and what to do to facilitate public use of these lands.

The National Park Service starts out with a General Plan for all GGNRA land but more detailed planning would come later if funding is identified to do these. We are interested in what comes out of this process.

Some discussions have occurred about a visitor's information center. Near Montara lighthouse was seen as desirable but challenging because of the difficulty making turns there. Also, it is on the west side of highway and near a former waste treatment facility. Across the highways is the remainder of a Naval Base training center currently owned by a teachers association. Think they can put in housing units there but this may not be realistic. It has ocean views and would connect perfectly to a future parallel trail on the east side of the highway, with room for some outdoor recreation facilities. Might be a good rest stop for the trail.

A challenge with locating a trailhead at the north end of Moss Beach is the proximity to a residential area. Need to check with residents before putting forth plans.

Emergency Response
April 29, 2011
9:00 – 10:00 am

Attendees:
David Cosgrave, Cal Fire
Mike Maskarich, CHP
Bill Kehoe, Mid-coast Community Council
Dan Burden, WALC
Paul Zykofsky, Local Government Commission
Josh Meyer, Local Government Commission
Shani Alford, Local Government Commission
Michael Moule, Nelson/Nygaard
Stefan Pellegrini, Opticos Design
Kevin Shively, Nelson/Nygaard
John Miki, Opticos Design

Notes

This corridor is not a big problem compared to other sections. Accidents are much lower than in other parts of the region. More problems occur during seasonal times, for example, the Pumpkin Festival. There is an increase in congestion but not accidents.

At Surfer's Beach drivers dodge pedestrians crossing the highway.
CHP does work the radar aggressively. Most accidents occur from DUI or right of way mistakes.

Community members are concerned about safety issues. CHP tries to minimize the impact to local residents during special events; they want to be very responsive to community needs.

Major intersections are of concern.

There is an increase in speed and traffic accidents during tourist seasons. Time and day are a factor of speeding, DUIs, and accidents.

Highway 1 is a heavily traveled road area.

Have responded to severe motorcycle accidents. Motorcycle traffic picks up in the seasonal months. Pedestrian accidents typically happen at night. May in part be due to pedestrians not wearing the appropriate night gear.

Accidents occur near Frenchmans Creek Road between Young Avenue and the next light going southbound. They also occur where motorists make left turns into the Montara lighthouse and hostel.

Emergency responders use the center line when traffic is congested. They are concerned about

medians because they will have to face oncoming traffic.
Tourists going Southbound leaving Moss Beach going towards the airport get distracted and get hit
When there is a vehicle accident on Hwy 92, Hwy 1 becomes very congested.

Cal Fire tries to hold to a 6 minute response time.

Does fog play a part in the response time and accidents? We do have some problems with the fog.

A design team member noted that roundabouts here would reduce speeds through intersections and encouraged the meeting participants to talk to emergency responders in other places that have roundabouts to get their opinions.

Other comments?
There are very few areas that have lighting and traffic controls.

In Half Moon Bay we sometimes have to oppose traffic.

We do have Opticoms but if they are hit by a vehicle they end up not working and there is no money to fix it.

Caltrans
District 4, Oakland
May 18, 2011
9:00 – 10:00 am

Attendees:
Beth Thomas, Caltrans
Aprile Smith, Caltrans
Robin Pon, Caltrans
Katie Yim, Caltrans
Lance Hall, Caltrans
Steve Monowitz, San Mateo County
Josh Meyer, Local Government Commission
Michael Moule, Nelson/Nygaard
Stefan Pellegrini, Opticos Design

Notes

Josh Meyer provided a handout with traffic volume information, an overview of corridor characteristics, and the project milestones to date. Steve Monowitz discussed County goals, including looking for ideas from the study that can help with the County's Comprehensive Traffic Management Plan.

Caltrans staff noted proposed changes in the draft update to the Highway Design Manual that might apply to urbanized areas of the midcoast, such as reduced lane widths on roads with speeds less than 40 mph. It was noted that safety issues can trump operational considerations when considering proposed changes. If signal warrants are meant, headquarters is shifting toward requiring that roundabouts be studied as an alternative. But single-lane roundabouts can be proposed for safety purposes.

The County has provided for a parallel trail in its land use planning for the area and plans to pursue Measure A funding to help implement.

Should consider trail placement to allow room for roadway expansion if needed to deal with congestion and commute times. Growth is limited by the Coastal Commission until traffic and level of service is improved, but some commercial development is necessary to reduce trips.

What is the potential for designated crosswalks or improved crossing conditions - what can be done to make random crossings safer? Are medians okay with speeds 45 or 50 mph?

Curbs would be discouraged if the speed is above 40 mph. Also, might have trouble meeting minimum median width requirement for a high speed facility.

Roundabouts might work because the main through volume is on the highway and much higher than volumes entering and exiting side streets.

What about bike lanes? They are okay to consider, but the local agency must ask for them to start the process.

What is the stance on parking? Should check with the Caltrans ROW Division on this. Generally, Caltrans will work with locals on this. Will ask the local to make a decision if parking is wanted. If there is not a safety issue, then Caltrans will review and generally approve it.