

APPENDIX A

INFORMATION SUBMITTED BY LEN ERICKSON

Highway 1 Safety and Mobility Improvement Study

San Mateo County Midcoast: Princeton, El Granada and Miramar

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Introduction

This report describes the background, process, and outcomes of the planning effort conducted in El Granada in June, 2009. The study focused on Highway 1 and adjacent communities between Frenchman's Creek in the City of Half Moon Bay, and the intersection of the Half Moon Bay Airport in unincorporated San Mateo County.

This document is the result of an intensive community-based planning process. The California Department of Transportation provided a Community Based Transportation Planning Grant 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 professional multi-disciplinary consultant team to develop plan components.

Study Area

The study includes two unincorporated coastal villages, Princeton and El Granada, and the village of Miramar, which is partially within the City of Half Moon Bay. State Route 1, a regionally significant roadway serving through and local traffic, provides the only access

between the villages and neighborhoods.

Multiple agencies have jurisdictional authority in the study area. The unincorporated villages of El Granada and Princeton are governed by San Mateo County. City of Half Moon Bay boundaries include the beach and coastline along El Granada, and a portion of Miramar. Pillar Point Harbor, adjacent to El Granada and Princeton, is under San Mateo County Harbor District's jurisdiction. Caltrans maintains and operates Highway 1, and the City of Half Moon Bay and San Mateo County maintain and operate other roadways. The entire study area is within the jurisdiction of the California Coastal Commission. The study area has about 11,000 residents.

Transportation along this segment of coast was once provided by rail and dirt roads. Later, the County provided a roadway, some of which eventually eroded into the ocean or was integrated into Route 1 (also known as Cabrillo Highway in this section).

Traffic flow on the highway ranges from rural conditions, where movement is typically free, to congested conditions during commute times with level of service issues at certain intersections, to unavoidable gridlock on weekends with good weather.

2008 Caltrans data indicate that the average daily traffic volume on the highway is 27,000

cars north of Frenchmans Creek Road, and then drops to 18,900 cars by Capistrano Road, and then to 16,300 north of Capistrano Road. During the busiest seasonal peak month, volumes increase by 2,500 north of Frenchmans Creek Road, and then drops to 1,300 by Capistrano Road. Posted speed limits vary between 45 and 50 miles per hour.

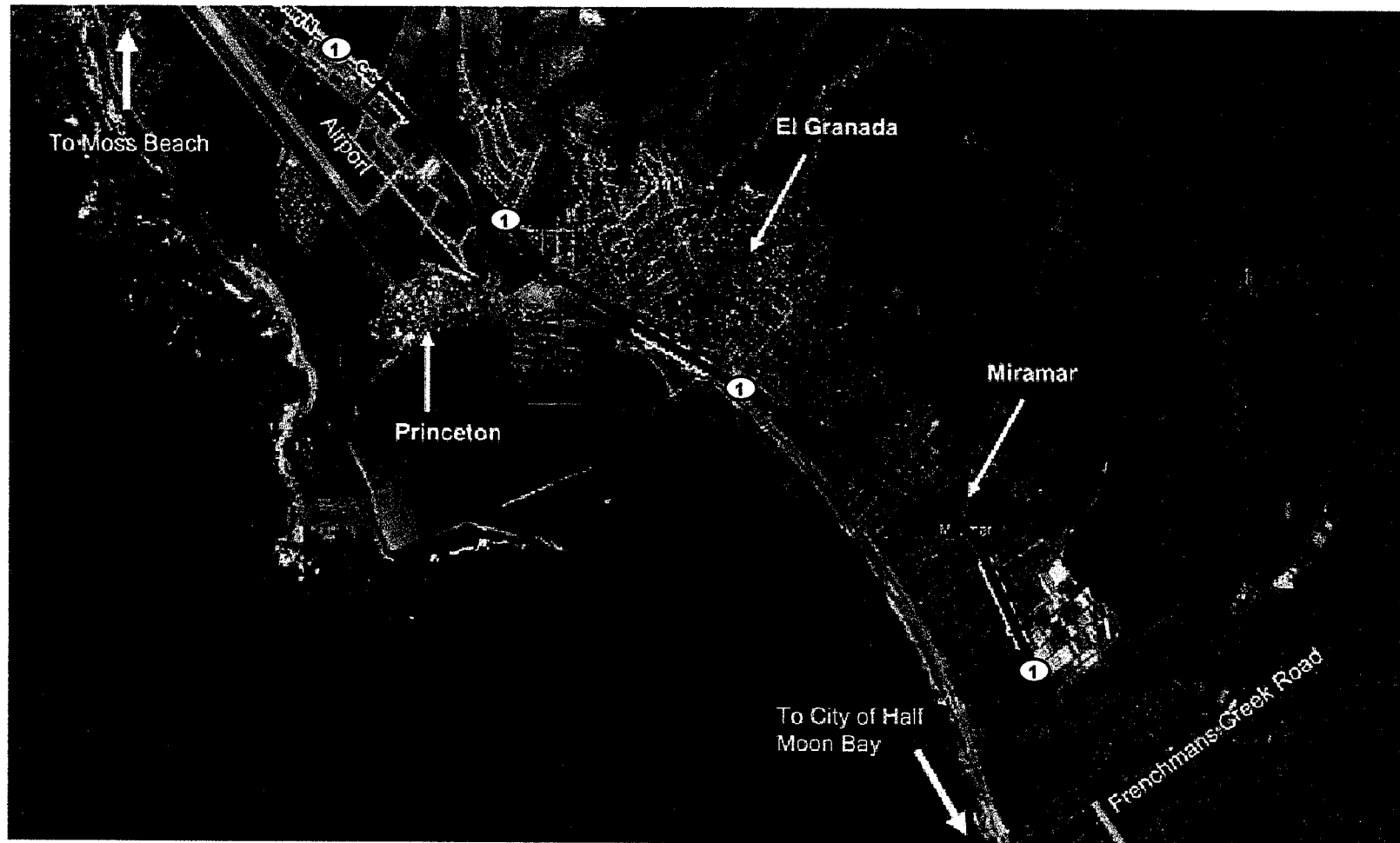
The Devil's Slide highway improvement project north of the study area, just south of Pacifica, has the potential to attract more use. In addition, a proposed office park and wellness center west of the highway between Princeton and Moss Beach (if approved and constructed as proposed) will also add more users to the highway.

Visitors park on Highway 1 shoulders in several locations, crossing the highway on foot, carrying picnic and surfing supplies. Through bicyclists make their way along the coast using road shoulders, some ride on completed portions of the Coast Trail. Mass transit, originally provided by the railroad, is now limited to a few bus trips each day.

Study Purpose

The study purpose is developing a plan for Highway 1 to better serve all users. Planning efforts by San Mateo County and other agencies are shaping development, recreation,

Study Area



Highway 1 on San Mateo Midcoast

infrastructure, and environmental policies within the study area. The community-based planning process engaged citizens in developing short- and long-term transportation improvement strategies consistent with established regional policies.

One of the biggest challenges is that the corridor must provide for commuters and high volume vehicle traffic on weekends, while maintaining safety and comfort for residents. It must also provide for pedestrians, people with mobility impairments, and bicyclists who are using the highway right of way or trying to cross.

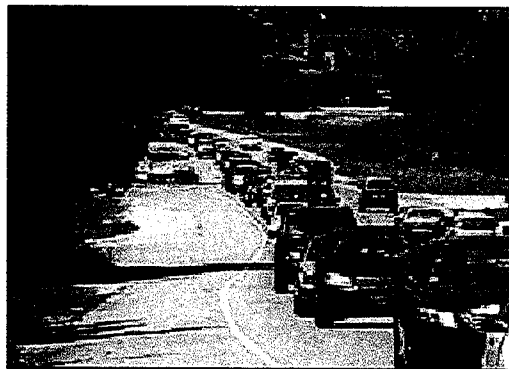
The primary goals of this project are:

- Increased pedestrian, bicycle and vehicle safety along Highway 1.
- More transportation options for those that



cannot, or choose not to use cars for local trips and commuting, reducing congestion and maintaining road capacity.

- A network of secondary alternatives for pedestrian and bicycle circulation, built upon existing and planned trails and other opportunity sites, such as El Granada's historic medians.
- A consistent highway corridor that supports the character and vitality of adjoining villages, recreation and natural surroundings.
- A long term vision for the corridor that addresses the challenge of shoreline erosion and is sensitive to the dynamic coastal environment.
- Reduced greenhouse gas emissions through the reduction of vehicle miles traveled.



AB 32 and SB 375

The Global Warming Solutions Act of 2006 (Assembly Bill 32) set carbon emission reduction requirements in California.

Passenger vehicles are the largest single source of greenhouse gas emissions in the state. Senate Bill 375 will set new reduction targets and require jurisdictions to adopt strategies to reduce vehicle miles traveled.





Public Process

A multi-day design effort, or charrette, was conducted from June 25 to June 30, 2009. Staff, community leaders, and residents participated in a series of events designed to identify concerns, priorities, and potential solutions.

The events began with a series of focus group meetings. Groups included agencies and districts; parks, trails, and open space; Caltrans engineers, planners, and architects; and the El Granada Sanitary District. The facilitator encouraged each group to share their knowledge, concerns, and ideas about the study area.

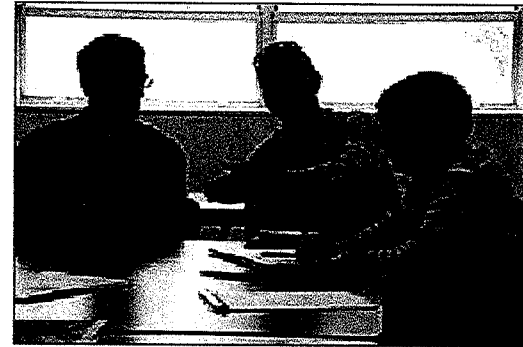
Highlights of the focus groups appear in the Appendix.

A Community Workshop was held in El Granada at the elementary school on Thursday, June 25. Participants shared ideas and viewed a slide presentation highlighting study area issues and techniques used in other communities. Participants described their vision for how they would like the area to be twenty years in the future. They took part in activities to identify values they held in common for their community and to identify leading issues to address for the future of the Highway 1 corridor, the coastal villages and natural surroundings.

Many envisioned a trail network linking Coast-side communities. Some would like to see trails from San Francisco to Half Moon Bay, Pescadero, or Santa Cruz. Everyone agreed about the need for safe crossing for all Coastsiders from Montara to Half Moon Bay. Fewer cars, more transit, and improved parking management were other common themes. Landscaping with native plants and adding bathrooms and water fountains were popular. See the Appendix for other participant ideas and priorities.

On Saturday, participants joined the consultant team to conduct walking audits. The group observed traffic and pedestrian patterns in the field, discussed concerns, and considered some ideas for resolving problems. After the field review, participants viewed a presentation recapping the Thursday night concepts and illustrating concepts for addressing issues within the study areas. Participants then gathered at tables to develop suggestions for improvements and present their results to the entire audience.

Some community concerns were beyond the scope of this project, but the improvement plan developed during the next four days reflected most of the input. On Tuesday, June 30, 2009, Consultants presented slides of the plan's key points at a Closing Workshop. Detailed notes from public processes appear in the Appendix.



Top: focus group participants share ideas, information and concerns about the study area. Left and above: workshop participants identify common values and vote priority issues. Far left, middle: participants walk, observe and discuss field conditions with a member of the consultant team. Far left, bottom: participant reports ideas developed through group table map activity.

Highway 1 Profile

The highway's context and roadway classification determine the type of roadway changes that can be considered. California statutes designate Route 1 from Higgins-Purissima Road south of the City of Half Moon Bay to I-280 as part of the California Freeway and Expressway system. The designation influences speed limits, access, and design features. State law also recognizes the dynamic nature of transportation planning, leaving an opening for designation changes.

Caltrans approaches 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. CSS and Caltrans Complete Streets policy described in Deputy Directive DD-64-R1 recognize that bicycle, pedestrian, and transit are integral elements of the transportation system.

The Route 1 corridor within the study boundaries (northern end of Capistrano Road and Frenchmans Creek) is a relatively short section of a primary State highway that follows the coastline. A brief overview of a longer portion of Highway 1, from south of Pacifica

Caltrans Deputy Directive 64-R1

Caltrans policies define Complete Streets 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."

to south of the City of Half Moon Bay, is useful for understanding the highway's larger, overall context and study area concepts that follow in later chapters.

At the northern end of the corridor, near Pacifica, there is a steep, unstable geological formation referred to as Devil's Slide. A long history of closure due to rock slide and land slippage in the vicinity prompted Caltrans to construct two 30-foot wide tunnels, one for northbound traffic, and one for southbound traffic and a bridge to bypass the problem area. The bypassed section of Route 1, together with 70 acres of State right-of-way, will be available for public access and recreational use following the planned tunnel opening in 2011.

Most of Highway 1 from south of Pacifica to south of the City of Half Moon Bay has relatively gentle grades, balanced horizontal

alignment, and rural highway super-elevations (embankments on curves to serve higher speeds). Highway cross sections along the corridor are inconsistent, and intersections and driveway treatments vary considerably. Adjacent and nearby land uses include open space, recreational, commercial and small urban areas, and residential neighborhoods. Near some recreation areas, vehicles park on highway shoulders and pedestrians cross the highway at frequent and unpredictable intervals. Highway 1 serves both local and through traffic, with numerous public and private driveways and other access points.

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

North of Montara

- Grade changes
- Minimal shoulders
- Relatively sharper curves
- Bike/Vehicle conflicts
- Recreation parking conflicts

Montara

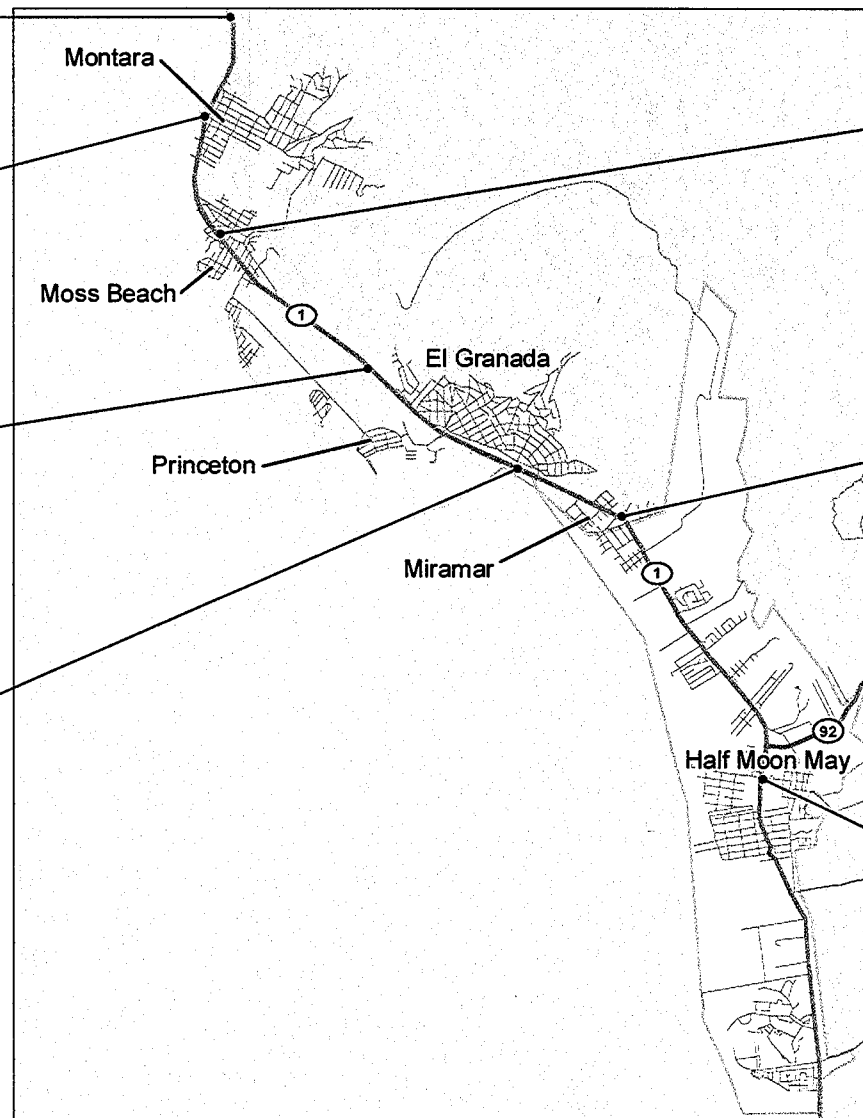
- Speeds
- Access management
- Highway adjacent parking loaded development
- Side street sight distance

Airport Segment

- Open cross section
- Gentle alignment
- Adjacent agricultural use and access
- Undefined airport access intersection
- Inconsistent number of lanes northbound
- Speed transition needs to El Granada

El Granada

- Coastal erosion
- Speed management
- High pedestrian crossing demand
- Varying traffic volumes and speeds
- Turning traffic at driveways and streets
- Sight distance challenges at cross streets
- Sight triangles and vertical alignment



General Corridor Observations and Issues

Moss Beach

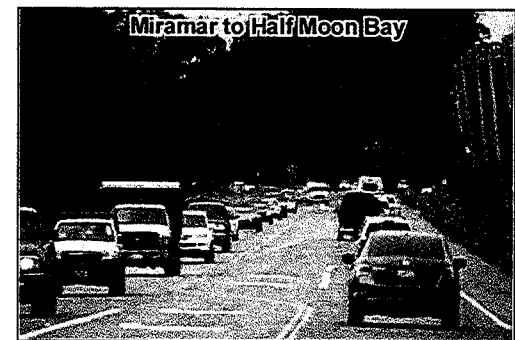
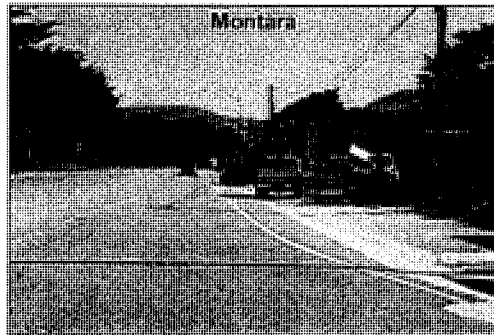
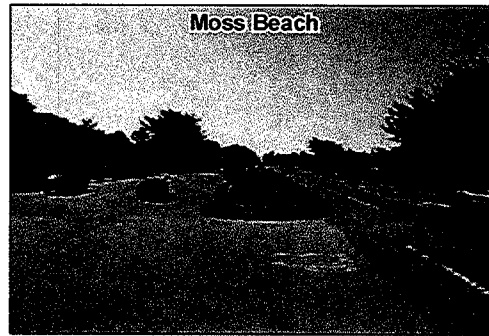
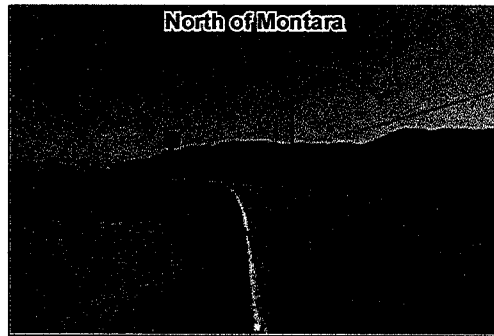
- Speeds
- Number of public street accesses
- Crossing traffic
- Inconsistent roadway edge
- Underdeveloped frontage "Main Street"
- Storm water treatment opportunity

Miramar to Half Moon Bay

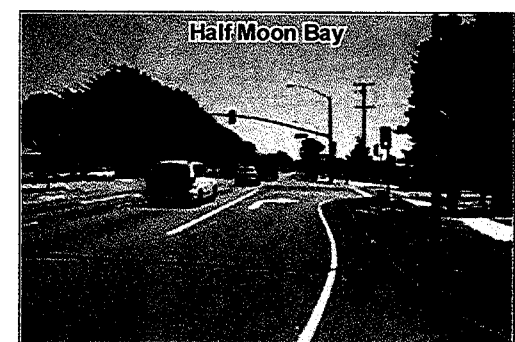
- Transitional segment
- Varying traffic volumes and speeds
- Relatively high number of accesses
- "Isolated" signalized intersection
- Turning traffic at driveways and streets
- Sight distance challenges at cross streets
- Sight triangles and vertical alignment

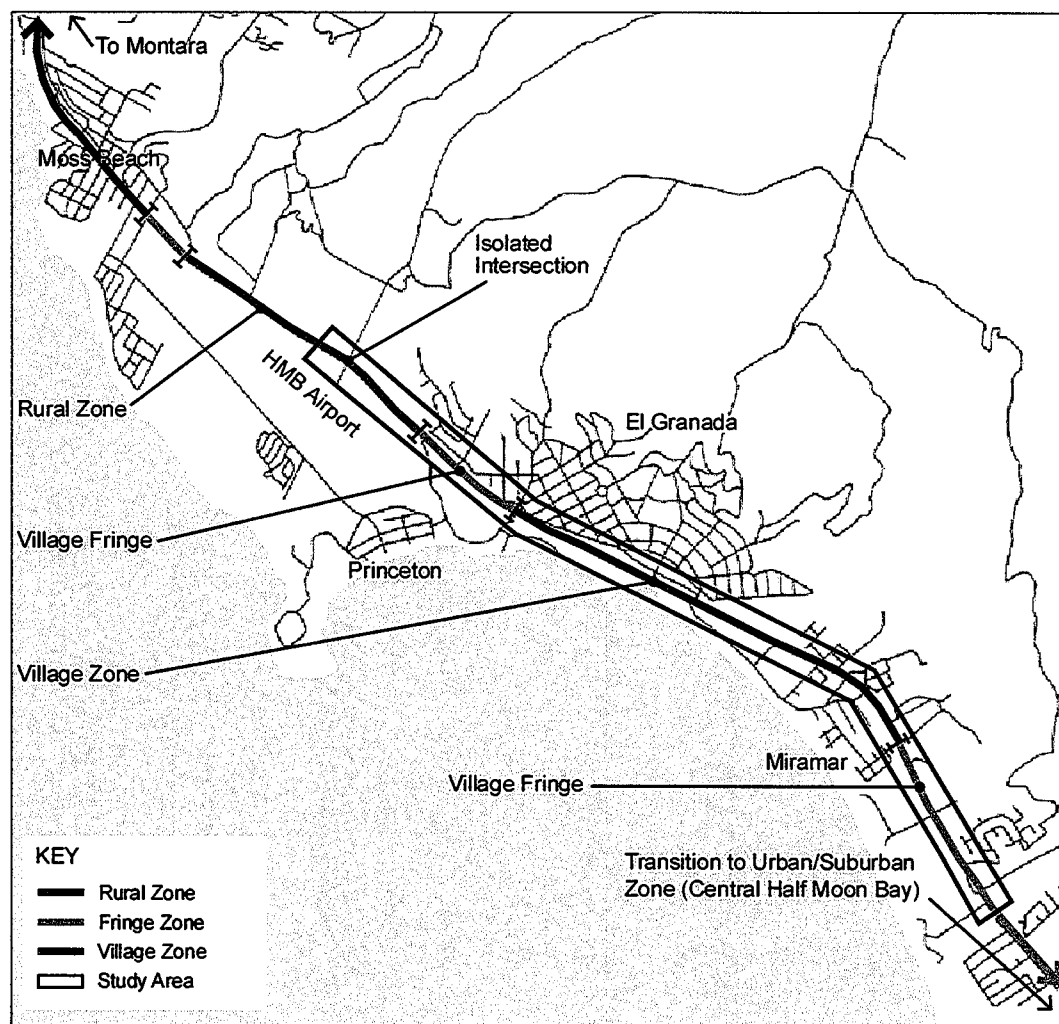
Half Moon Bay

- Heaviest volumes
- Signalized intersections
- Significant highway crossing demand
- Inconsistent edge treatments
- Inconsistent typical cross section south of Kelly Avenue
- Unbalanced treatments to Main Street



Top Left, Middle and Bottom: narrow shoulder on Highway 1, looking north from the fringe of Montara; potential parking conflicts with through traffic, pedestrians and bicyclists; multiple crossing traffic locations in central Moss Beach. Top Middle and Bottom: parallel road to the highway provides opportunity for main street development and space for stormwater retention and treatment; isolated intersection at Half Moon Bay Airport is difficult to detect. Top Right, Middle and Bottom: High pedestrian and bicycle activity and crossing demand in El Granada; varying traffic volumes and speeds from El Granada to Half Moon Bay; suburban intersection in City of Half Moon Bay.





The map above divides the study area into three types of context zones.

Context Zones

The surrounding land uses and historic development patterns vary throughout the Highway 1 corridor and within the study boundaries. The various areas can be described as context zones with similar characteristics and user needs. Although the Route 1 corridor is legally defined as a freeway/expressway, motor, pedestrian and bicycle traffic function differently within each of the context zones.

Rural Zones

Rural zones are sparsely developed and primarily agricultural or recreational uses. An example includes Route 1 between the southern fringe of Moss Beach and access to Princeton, north of El Granada. In rural zones, there are generally few pedestrians, bicyclists, and access points. Vehicle speeds tend to be high.

Isolated Intersections

Isolated intersections are infrequent intersections with no traffic control. An example is the intersection that provides airport access in the rural segment between El Granada and Moss Beach. In isolated intersection zones, drivers slowing to make a turn or entering the highway pose a potential conflict. There may be pedestrians or bicyclists crossing at or near the intersection. Driver awareness and intersection visibility are key safety factors. Motorists may not recognize or be aware of all intersections

and the increased potential conflicts at these locations. Relatively high speeds increase stopping sight distance requirements and the risk of injuries associated with conflicts.

Village Fringes

Village fringes are transitional segments on approaches and exits at village edges, where rural context attributes begin changing. Pedestrian and bicycle activity is likely to increase in the fringe areas, and more traffic turns on and off Highway 1 to access residential and commercial areas. Driver speeds should begin to lower as drivers become aware of the changing context and anticipate potential conflicts or seek access to local sites. In many places, mixed and undefined adjacent land uses provide few cues to trigger speed reduction.

Village Zones

Village zones include the coastal communities of Montara, Moss Beach, Princeton, El Granada, and Miramar. In Villages, potential traffic conflicts increase as visitors and residents seek parking, recreation, retail, transit stops, and restaurant sites. Pedestrian and bicycle traffic increase, and traffic movements at major intersections may be controlled with signs or signals.

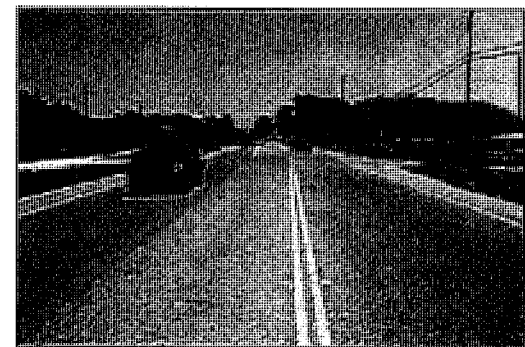
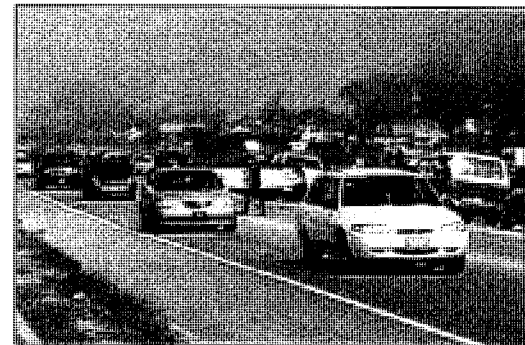
Urban/Suburban Zones

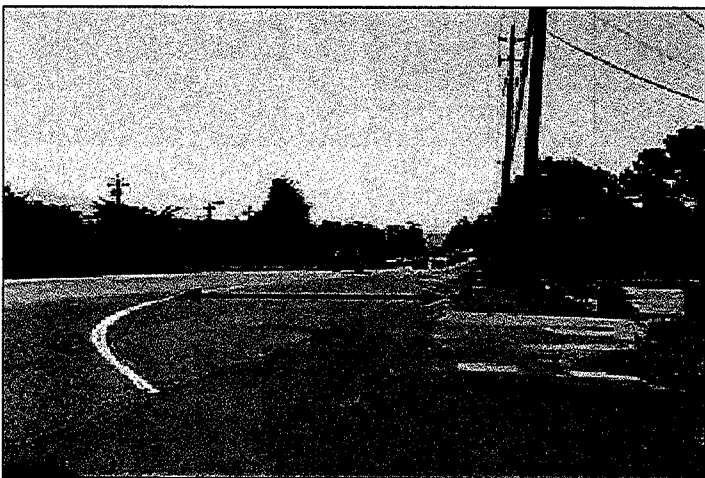
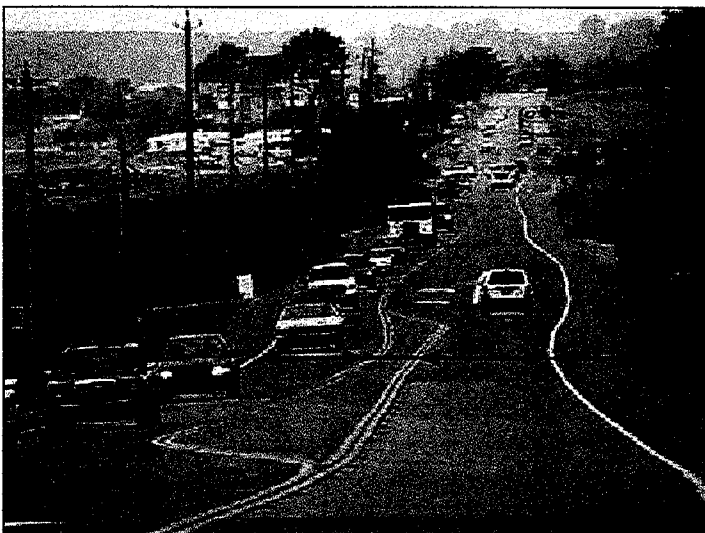
Urban and suburban zones along Highway 1 occur in the City of Half Moon Bay. These areas are similar to village zones, but with

greater traffic volumes and more access points. Slower speeds are appropriate in village and urban/suburban zones to allow drivers time to see and react to multiple users and traffic conditions. These locations have more urbanized roadway features (sidewalks, curbs, traffic signals, cross walks) than other areas along the corridor.

Site design and roadway characteristics in each of the zones influence speeds at which drivers will be comfortable, the ease of street crossings for pedestrians and bicyclists, and the comfort and sense of security of those walking and bicycling along Highway 1. Along parts of the corridor, roadway features and land use suggest high speeds are appropriate. These speeds may be incompatible with other user needs within the various context zones. Strategies to encourage safe operating speeds and behaviors within each zone are discussed in the following section.

Top right: the roadway segment approaching the intersection at Half Moon Bay Airport exhibits rural characteristics with open agricultural and largely undeveloped lands. Middle: this segment between Surfer's Beach and El Granada exhibits village-type characteristics with increased development, high pedestrian activity, varying traffic volumes and speeds, and turning traffic at driveways and intersections. Bottom: this segment between Miramar and Half Moon Bay exhibits fringe characteristics, with lighter development but numerous access points, turning movements and changing traffic speeds and volumes.





Top: Miramar looking north toward El Granada. Bottom: Miramar looking south. The photos show a lack of consistent built cross section width and characteristics and lack of defined inside and outside edges.

Recommended Strategies

This section outlines an overall corridor strategy and tools suitable in the various context zones along Highway 1. The approach is intended to facilitate highway consistency throughout the study area, with changes adapted and sensitive to the varying physical surroundings and operational needs of the roadway.

Define Edges

Currently, Highway 1's wide range of roadway cross section characteristics and features vary from rural shoulder applications with inconsistent widths to painted medians that vary in their application and widths. Curbed locations are intermittent and the location of property lines, lot development, or driveway edges occur at different distances from the edge of the travel way. This variation reflects a highway facility that has developed piecemeal over time.

A consistent roadway contributes to driver understanding of the environment. Roadway edges, intersections, and driveways should be easily identified.

Travel lanes should be well-defined on the shoulder edge and on the inside edge. Shoulders or striped on-street bike lanes along Route 1 would positively influence driver interpretation of the roadway. Other features to define edges in some context zones include contiguous curbs or edged treatments.

Inside travel edges can be defined by consistent median width, with changing treatments to define context zones. For example, the median might be a flush, center turn lane in rural zones, a colorized, stamped flush median in village fringes, and a raised median with turn pockets in villages.

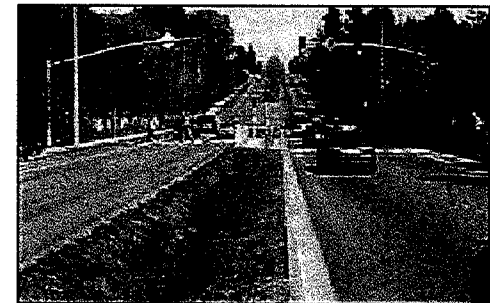
Medians improve highway safety in various ways. Flush medians or center turn lanes remove turning traffic from through lanes and provide consistent inside edges. Turning vehicles have an area away from through traffic in which to wait for a gap in oncoming traffic so they can turn. Flush medians provide space between through lanes where pedestrians can wait for a gap in traffic, but there are still potential conflicts with turning vehicles.

When the median is raised, curbs prevent drivers from using the space so the conflict between drivers and pedestrians is eliminated. Raised medians also prevent crashes caused by head-on and crossover traffic. Raised medians can be continuous, with openings where turns are permitted, or they may be short segments strategically placed within flush median areas to facilitate pedestrian crossings, restrict vehicle turning movements, or prevent traffic from using the center turn lane for through travel or passing slower vehicles. Raised medians provide space opportunities for landscaping and reducing impervious coverage.

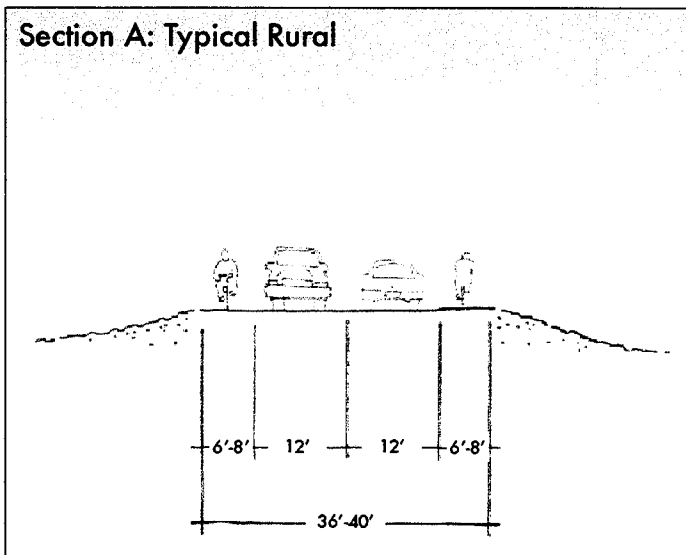
The Highway 1 roadway sits within a wide Caltrans right-of-way, averaging 160 to 180 feet from Miramar to El Granada. The addition of medians and road edge improvements could be accomplished without the need for property acquisition. Street cross section drawings are presented on the following pages to serve as guidelines for developing a consistent roadway edge through each of the Route 1 context zones.



Top Left: Shoulder with stamped, colorized pavement clearly defines road edge on State Highway 16, Capay Valley, Ca. Top Right: landscaped swale delineates the road edge and provides area for natural drainage, and separation between the road and sidewalk. Above Right: raised median with high contrast decorative landscaping. Right: center median designed with a landscaped swale for natural drainage and pedestrian refuge area at a signalized, stop-controlled pedestrian crossing.

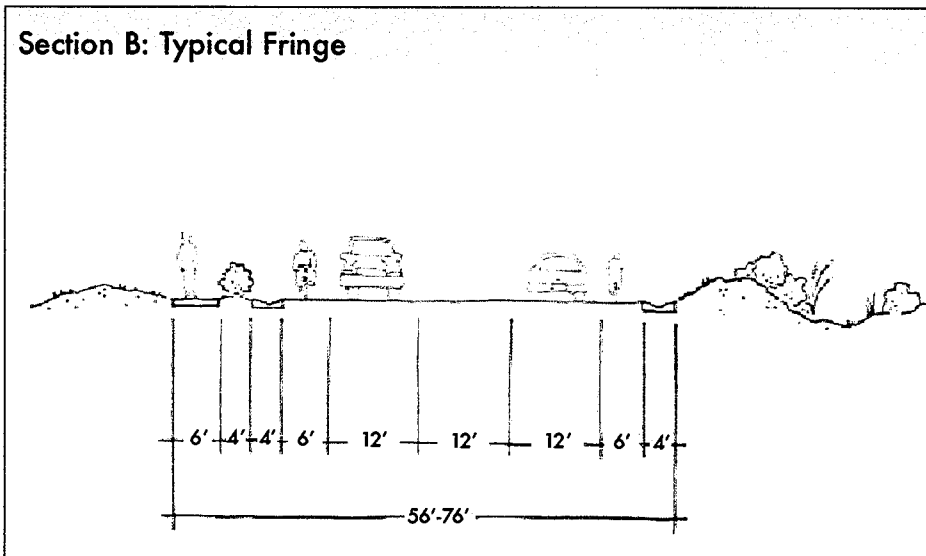


Section A: Typical Rural



Section A (left) is applicable to some rural areas where intersections are infrequent and speeds are posted at or above 45 mph. Since higher speed zones require wider lanes, 12-foot lanes would be typical in rural areas. Shoulders 6 to 8 feet wide provide breakdown parking, emergency passing, and room for bicycling or walking (where there are no trails or sidewalks). This type of treatment would apply between the north terminus of Capistrano Road to the village fringe of Moss Beach. In areas with more frequent turns, a center turn lane, or striped (flush) median, may be needed.

Section B: Typical Fringe



Section B (left) shows a typical section where the rural section transitions to a more strongly defined edge. Both sides of the road show a valley gutter to set the edge. Here, lane widths less than 12 feet may be considered if speeds are reduced below 45 mph. Reduced lane widths can help signal a change in context and encourage speed moderation. A sidewalk with a planted buffer between the travel lane and the sidewalk is shown on one side. This does not mean a sidewalk is only needed on one side of the highway. It simply illustrates the sidewalk concept in fringe areas where they are needed.

Section C (right) is a typical village cross section with some urbanized features, including curb and gutter, median, bike lanes, and sidewalks. Lane widths less than 12 feet wide may be appropriate in these zones. Reduced lane widths in village areas can help moderate speeds, reduce crossing distances for pedestrians, provide room within the same right-of-way for streetscape enhancements, and reduce the overall amount of land consumption for pavement.

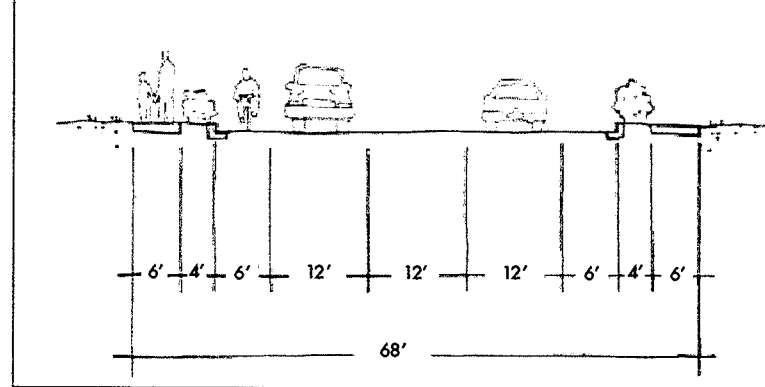
Improve Intersection Visibility

Intersections and driveways are locations of increased conflicts for all roadway users. Speed reduction is not always necessary at intersection locations in all context zones. However, drivers should be aware of all intersection locations to be prepared to respond to increased conflicts. Intersection treatments should make them noticeable when entering and traveling through the intersection influence area. Treatments can include illumination and changed cross section elements such as curbing or median treatments.

Many intersecting side streets with Highway 1 in the study area are below the level of the highway, forcing vehicles to the edge or into the travel way to look for clearance before turning onto the highway. Raising the approach grade on these intersecting side streets would improve intersection sight distance and promote more efficient turning maneuvers.

Where possible, curb radii at intersections should be kept tight, 15 feet or less, to encourage safe turning speeds. Compact curb radii are especially useful in zones where pedestrians are expected, because they slow vehicle turning movements and shorten pedestrian crossing distances.

Section C: Typical Village



The change in approach grade reduces driver sight distance.



Entry Treatments

In addition to identifying place, gateways send a message to drivers that the environment is changing. Gateways along Highway 1 could include roadside signs or landscaping, landscaped raised medians, or roundabouts. Flags and banners are visual aids for vehicle occupants as well as for people who are walking or bicycling.



Roundabouts

Roundabouts are one strategy to improve some intersections within the study area. Roundabouts are un-signalized intersections in which traffic circulates counterclockwise around a raised center island. Vehicles in the roundabout have the right-of-way over entering traffic. Motorists slow down as they approach the intersection, yielding to any pedestrians in the crosswalk. The yielding driver looks left, waiting if necessary for a gap in the traffic flow before merging into the roundabout. Once inside the roundabout, drivers turn right at their exit.

Roundabouts have 76% fewer injury crashes and 30-40% fewer pedestrian crashes than signalized intersections. The most severe intersection crashes, often caused by red light running, are eliminated at roundabouts.

Roundabouts generally reduce motorist delays at controlled intersections, though there may be some delay at a roundabout during peak periods, just as there would be at a signal. But during periods when traffic levels are low motorists do not have to stop. This is especially beneficial in the study area because traffic volumes vary widely from day to day. Roundabouts also reduce pollution, save fuel, reduce the need for storage lanes, and improve traffic flow at intersections with frequent left turns.

Pedestrians cross roundabouts at designated crosswalks. They cross one direction of traffic, wait in the refuge island to be sure a driver is going to yield, then complete their crossing. People with visual impairments rely on audio information to determine when it is safe to cross. At roundabouts it may be difficult for them to determine when traffic has stopped to wait for them.

Experienced bicyclists can proceed through the roundabout in a traffic lane, following the same rules as other vehicles. Cyclists may also use sidewalks or trails and pedestrian crossings.

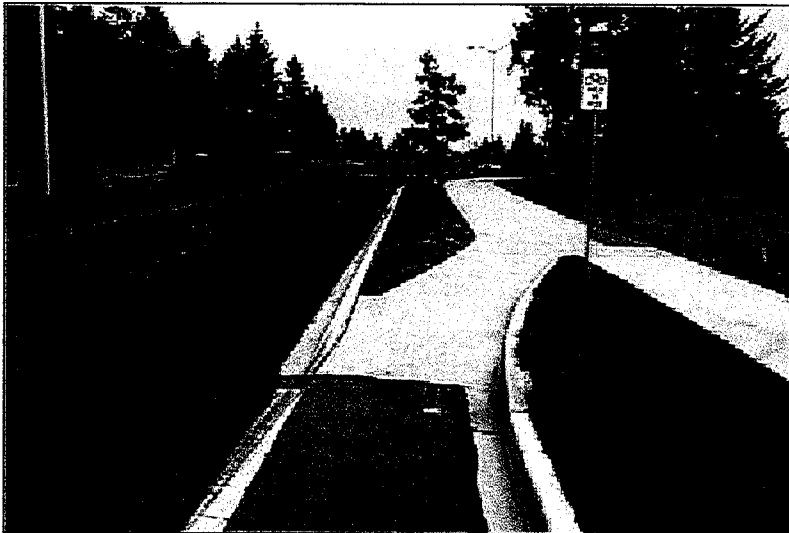
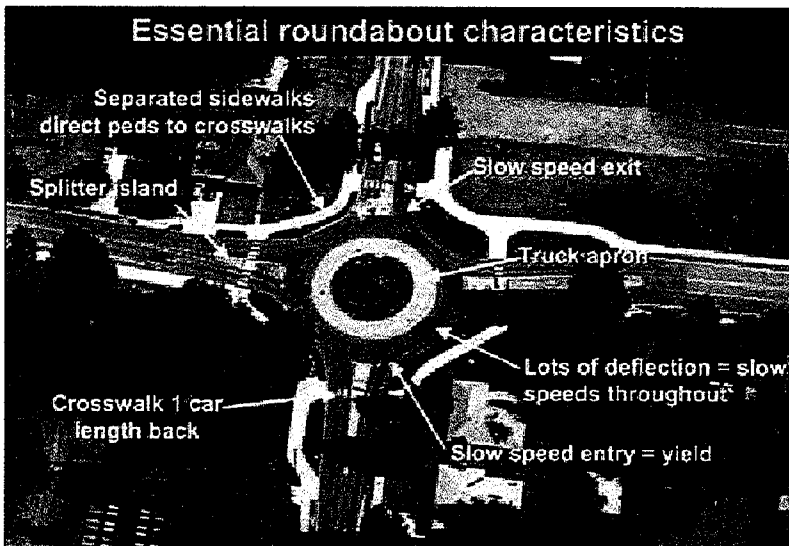
Large trucks and long fire engines drive over the curb on the truck apron

in the middle to make the tightest turns. The truck apron surrounding the center island uses contrasting paving and slopes slightly up toward the middle. Normal vehicles stay off the truck apron.

Roundabouts save signal maintenance and power costs. The service life of a roundabout is 25 years versus the 10-year service life of signal equipment.



Roundabout size is dependent upon the volume and type of traffic that will pass through the intersection. Roundabouts can be designed to accommodate large trucks.



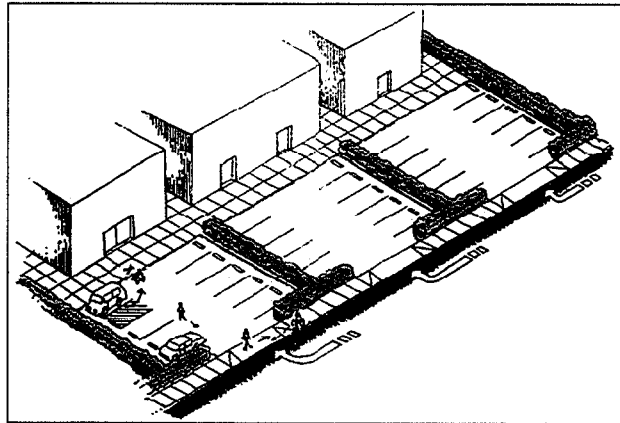
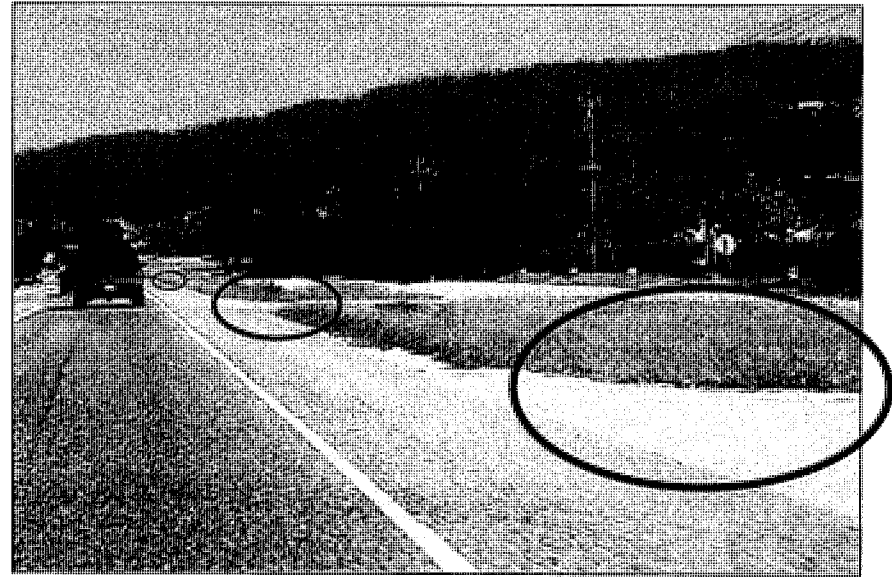
Roundabouts are still new in the U.S. and many communities express concern when they are first proposed. However, once built, residents often embrace them and recognize that they are safer, quieter and more attractive than signalized intersections. Traffic engineers are recognizing that roundabouts can be more efficient than a typical stop-controlled or signalized intersection. The lower speeds and more predictable vehicular movement also make them safer for pedestrians and bicyclists. Other important reasons for considering roundabouts include:

- A typical 4-way intersection has 32 vehicle-to-vehicle conflicts. At a roundabout these conflicts are reduced to 8.
- Properly designed roundabouts will bring vehicle speeds down to 15-20 mph, speeds at which motorists are much more likely to yield to pedestrians and the frequency and severity of accidents are greatly diminished.
- The splitter island in a roundabout 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.
- Roundabouts also work well for bicyclists. Most bicyclists simply take the travel lane since vehicles are circulating at a comfortable bicycle speed. Less confident bicyclists can be provided a ramp on the approach to the roundabout so they can exit and walk their bicycle across at the crosswalk. (In areas with high bicycle use, sidewalk and crosswalk areas should be wide enough to avoid creating conflicts between bicyclists and pedestrians.)
- 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.

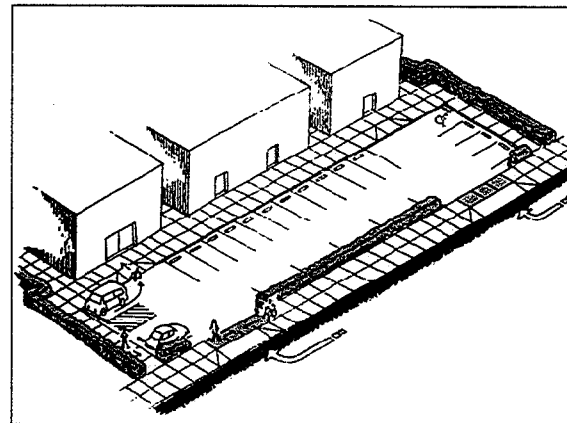
Manage Access

“Access management” means managing vehicle turning movements on to and off the highway. The purpose is to improve safety and traffic flow while maintaining access to property.

The Route 1 corridor offers opportunities to consolidate driveways, limit turning movements to and from side streets, and re-configure parking. This would reduce the number of turning movements and points of conflict without sacrificing access. Driveways can often be consolidated so that there is one entry and one exit. In some cases, access can be moved to side streets, such as parallel frontage roads or small service roads.



Multiple driveway access points increase points of conflict between motorists and between motorists, pedestrians and bicyclists.



Consolidating driveway access reduces vehicle turning vehicle conflicts with through traffic and extends the pedestrian's and bicyclist's path without conflict opportunity.

Above: Multiple driveway path openings on Route 1 detract from a consistent edge condition and introduce potential conflicts between turning vehicles and high speed through traffic.



Sidewalks are needed along Route 1 in village and fringe areas where there are no adjacent trails.

Add Walkways and Bikeways

All context zones along the Route 1 corridor currently have some level of pedestrian and bicycle use, although pedestrian activity in rural zones may be limited to parking near recreation sites. Some of the tools already discussed enhance pedestrian and bicyclist safety and mobility. Examples include:

- Access management strategies reduce pedestrian and bicyclist exposure to turning conflicts
- Medians between through lanes provide space to wait for a safe crossing opportunity
- Improved visibility and lighting at intersections makes it more likely a driver can see and react to those who are crossing

Walkways

Pedestrian needs vary in different context zones. In rural and some fringe zones there will be few pedestrians, and a roadway shoulder or bike lane may be adequate. In locations served by transit, pedestrians of all ages and abilities should have ADA compliant walking routes to transit stops. Within the study area, pedestrians generally need sidewalks separated from the highway between Capistrano Road (southern end) and the City of Half Moon Bay. People usually walk on the side of the street that is most convenient and avoid crossing the street twice to access a destination, so walkways are needed on both sides of the highway. In village fringe zones, a walkway on one side of the highway may be all that is practical or necessary in the short term, but the need for highway crossings should be addressed, especially at transit stops, since transit users need to access buses on foot or by bike. Long term plans should include walkways on both sides of the highway.

The typical Fringe and Village cross sections (Sections B and C) show 6-foot minimum sidewalk widths separated by a minimum 4-foot wide buffer zone between the sidewalk and roadway. 6-foot sidewalks will enable people to walk side by side. Wider sidewalks may be needed where high pedestrian traffic exists or is desired (for example, near beach access or commercial activity areas). The buffer zone provides distance and space for landscaping

and other vertical treatments to separate the pedestrian environment from motor traffic and help direct pedestrians to safe crossing areas.

Bikeways

There are opportunities for including bikeways along Route 1. Bikeways are defined by Caltrans as facilities provided primarily for bicycle travel, but sometimes shared with pedestrians. Trails could include off-street bike paths, hiking trails, equestrian trails, unpaved walking or mountain-biking routes. Design of bikeways considered Class I, II, or III are guided by the Caltrans Highway Design Manual.

Class I Bikeway: Bike Path/Multipurpose Trail

Bike paths provide a separated right of way for



Trails along the coast are well-used. Trails need to be wide enough to accommodate bicyclists and pedestrians. Where use is very high, separated facilities may be needed.

the exclusive use of bicycles and pedestrians, with cross flow by motorists minimized. Crossings should be limited because they are the most common point of conflict between motorists and bicyclists. Drivers turning across bike paths are often focused on finding a gap in traffic, and may not be watching for bicyclists or pedestrians. Some bicyclists have a tendency to maintain momentum through crossings, and may fail to stop or yield to vehicle traffic. Conflicts can be minimized with good visibility, but bike paths that parallel roadways will best serve bicyclists if the number of driveways and streets that cross the path are limited. Bike paths must be located at least 5' from the edge of the shoulder, or include a physical barrier, such as railing. Physical barriers can present visibility issues at crossing points.

Class II Bikeway: Bike Lanes

Bike lanes are one-way lanes on streets, marked on the right side of the vehicle travel lane closest to the curb. Bike lanes pockets are often provided where motorists turn left. Where parking is permitted, the bike lane is between parked cars and the travel lane. At traffic signals, a bicyclist needs a marking to show where to place the bike to actuate the signal for a green light, or to have access from the bike lane to a pedestrian push button.

Although many bicyclists prefer riding on bike paths or multipurpose trails, some prefer to ride in bike lanes. In bike lanes, bicyclists follow



the rules of the road, and are only required to yield or stop for cross traffic under the same conditions in which a motorist would yield or stop. Bicyclists in streets must ride in the same direction as traffic. In addition to providing space for bicycling, bike lanes provide a buffer between pedestrians and traffic, visually narrow the roadway to encourage slower speeds, and serve as a walkway in rural areas.

Class III Bikeway: Bike Route

Bike routes provide for shared use with pedestrian or motor vehicle traffic. Not all shared streets are designated as bikeways, and in fact, most 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.



Top left: many bicyclists use the shoulder on Route 1 for commuting, exercise and recreation. Top right: riders choose the shoulder against traffic over the adjacent multipurpose trail. Above: clearly designated lanes and a consistent edge condition like the example above placed on both sides of Route 1 would provide clarity for motorists and bicyclists alike.

The typical Fringe and Village cross sections (Sections B and C) propose 6-foot on-street Class II bike lanes. The typical Rural cross section (Section A) proposes a finished shoulder suitable for a Class II bike lane or Class III bike route designation. For all cross sections, striped lanes, especially when combined with shoulder treatments such as different pavement types, patterns and colors, will further distinguish the road edge, add visual friction and visually narrow the perceived travel way while maintaining adequate travel lane width for safe motor vehicle operation. Visual definition and tightening of the roadway will in turn encourage moderate speeds. Changes in the shoulder edge treatments can be used to help signal the transition from rural to more urban village conditions.



People want and need to cross the highway at convenient locations. Providing well-designed, highly visible crosswalks at convenient locations can help consolidate random crossings. Fences and barriers to force pedestrians to use inconvenient access points can be expensive, unsightly, and futile.



Highway Crossings

Pedestrians want and need to cross the highway for a variety of reasons. Some will walk to enhanced crossing areas if they know where they are, but the distances people are willing to walk varies. Although it can be tempting to consider installing fences or barriers to “channelize” pedestrians, these solutions are costly, are not totally effective, and could obscure ocean views.

Many Route 1 crossings in the study area do not occur at crosswalks because the majority of residents live on the northeast (inland) side of the highway and there are no marked crosswalks nearby to reach destinations on the ocean side. Visitors also randomly cross the highway between the beach and parking areas due to the lack of convenient, well-marked crosswalk locations.

Adding striped medians as proposed in the typical cross sections would provide a first



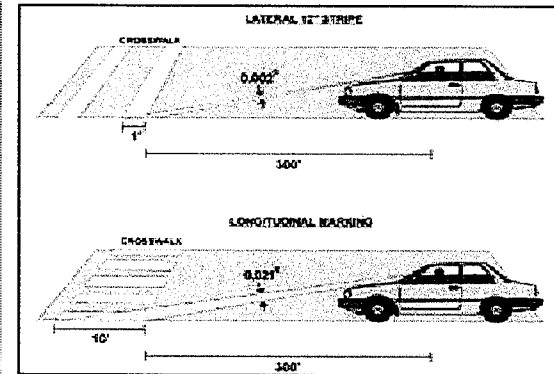
Where can pedestrians legally cross Route 1?

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. California 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 unless the adjacent intersections are 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.

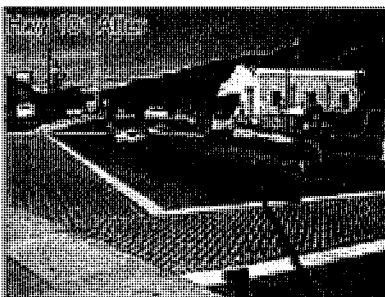
step toward creating opportunities for safe, orderly crossing points by establishing a space between lanes of moving traffic. A second step would be consolidating highway crossings at desired access points and enhancing a marked crosswalk so it becomes a prominent and appealing crossing location to pedestrians, and highly visible to motorists. The crosswalk must be conveniently located. Improvements could include raised medians designed to serve as pedestrian refuge islands, crosswalk markings and pavement contrast to heighten the visibility of the crossing area, flashing lights, or pedestrian signals or flashing beacons.



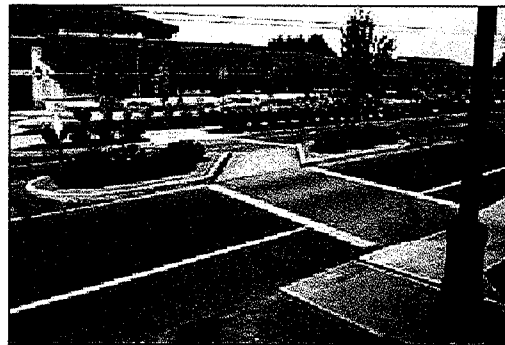
Pedestrian waits for gap in traffic to complete crossing.



Longitudinal crosswalk markings are more visible to motorists than horizontal striping.



High contrast pavement treatment to highlight the pedestrian crossing area is added to an intersection on Highway 101.



Raised medians allow pedestrians to cross one-half of the roadway and wait in the center for an opportunity to cross the other half. Some raised medians walkways are angled so pedestrians face oncoming traffic before crossing.

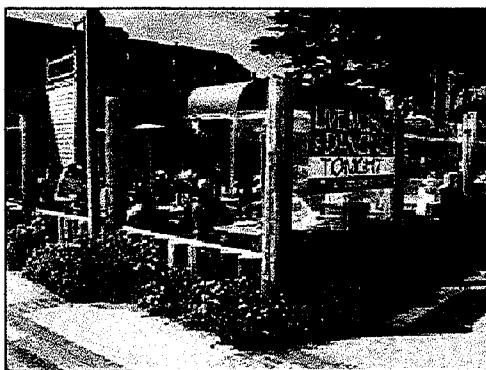


Raised median island with high visibility markings. The stop bar for vehicles is set back from the crosswalk.

Coastal Village Economic Opportunities

There are small commercial areas within the three coastal villages of Princeton, El Granada, and Miramar. Enterprises include a grocery store that features mostly convenience foods, several restaurants, tourist-oriented shops and services near the harbor, a hardware store/café and several other small entities. These businesses rely on tourist and local residential trade. Some businesses are not highly visible to tourists because the highway does not pass close to their location, and recreational visitors may not notice them because parking is not close to the businesses. Some stores do not enjoy local patronage because many residents make frequent trips to the bayside and buy what they need while there.

Highway strategies have the potential to



enhance economic opportunities while improving traffic flow and safety. Slower speeds in village areas, for example, give motorists time to notice attractions, decide where to turn, and assess parking opportunities. Parking areas, trails, and crossings close to shopping and restaurants can encourage visitors to stop, park



Corridor improvements could help stimulate village-oriented economic development in areas such as Portola Avenue in El Granada (top photo) and Miramar (bottom photo).

once, and eat or shop.

Infill development takes advantage of under-used or vacant properties within developed areas. This approach conserves land, takes advantage of existing infrastructure, and brings new life to existing areas. Within the study area, there are ample opportunities for infill near existing village commercial areas. Clustering commerce in one area increases its desirability as destination where tourists and residents can access a variety of goods and services.

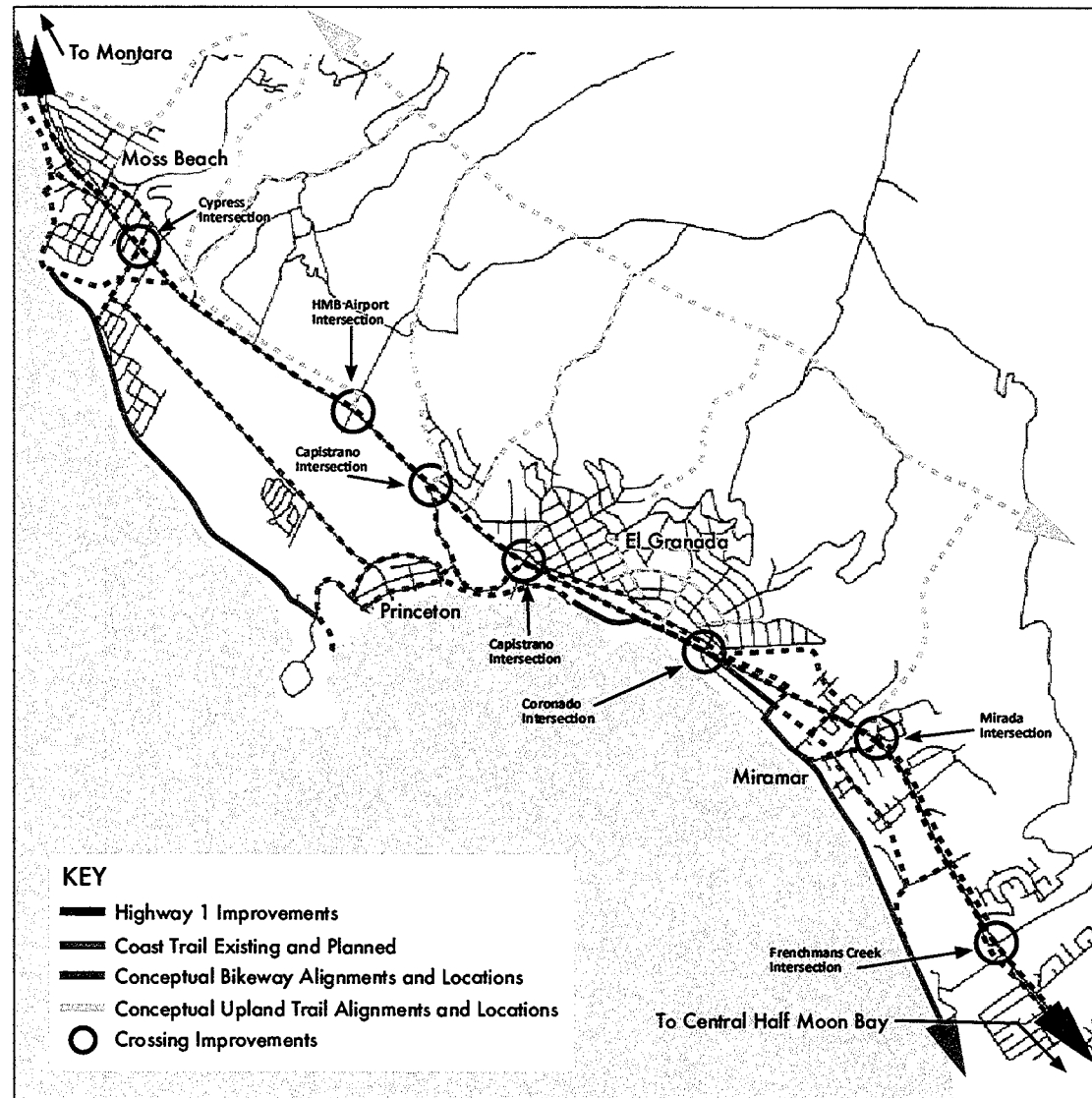
Mixed-use development provides space for a variety of uses that often includes retail, office, and residential uses within a compact area or a single building. Mixing in residential uses provides living quarters for shop keepers, workers, or others. When done in conjunction with pedestrian and bicycle-friendly access, mixed-use in-fill development encourages people to reduce car trips and support local business.

Intersection improvements, including roundabouts, can provide opportunities for in-fill development in highly-visible areas, where businesses can take full advantage of potential tourist trade and improved access for all modes of transportation. Strategies for specific intersections near existing commerce are discussed in more detail in later chapters.

Connectivity and Mobility Framework

The corridor strategies outlined in the previous section are intended to improve the safety, efficiency and experience of Highway 1 for users of all types and abilities. This is especially important because the highway serves as the principal and perhaps only viable motor vehicle travel route linking the uses, neighborhoods and communities of the San Mateo County Midcoast. Residents and visitors are largely dependent on the highway for commuting and many local trips. Developing additional links for different travel modes that provide alternatives to vehicle trips on the highway can help improve roadway function and maintain capacity.

Charrette participants emphasized the need to connect existing trails, add new trails for all user groups, and provide additional defined highway crossings. The map on the right illustrates concepts for a completed pedestrian and bikeway network within the study area and surrounding communities. Completing missing links in the existing Coastal Trail and providing additional trails, bikeways, walkways and crossing opportunities would enable residents and visitors to make more trips on foot or by bicycle instead of in cars.



Study Area Bicycle and Pedestrian Transportation Network

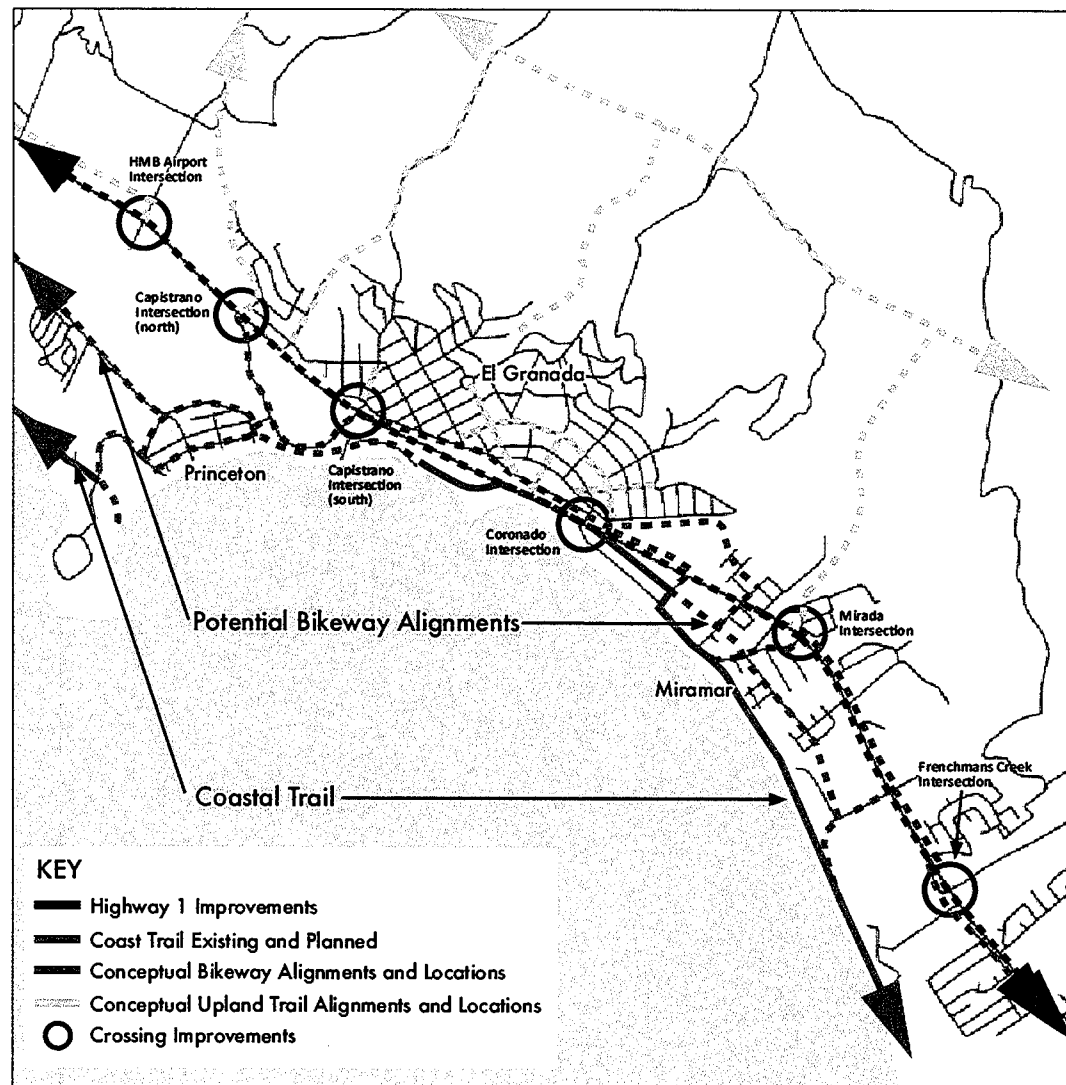
As described in the previous chapter, Highway 1 has the potential to serve as a primary route for bicyclists and pedestrians through shoulder improvements, provision of bike lanes, and provision of sidewalks in village and village fringe areas.

There are additional opportunities for an off highway route system for pedestrian and bicyclists to improve connectivity between Midcoast communities and connect key destinations. Different portions of the route network could be developed with the following treatments:

- Separated bicycle or multi-modal trails.
- Improved low speed, low traffic streets for shared bicycle and motor vehicle use.
- Striped on-street bike lanes.
- Added or enhanced sidewalks.

The California Coastal Trail alignment provides a north-south inter-community mode of travel that largely avoids the highway. 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.

Within the study area, south of Pillar Point,

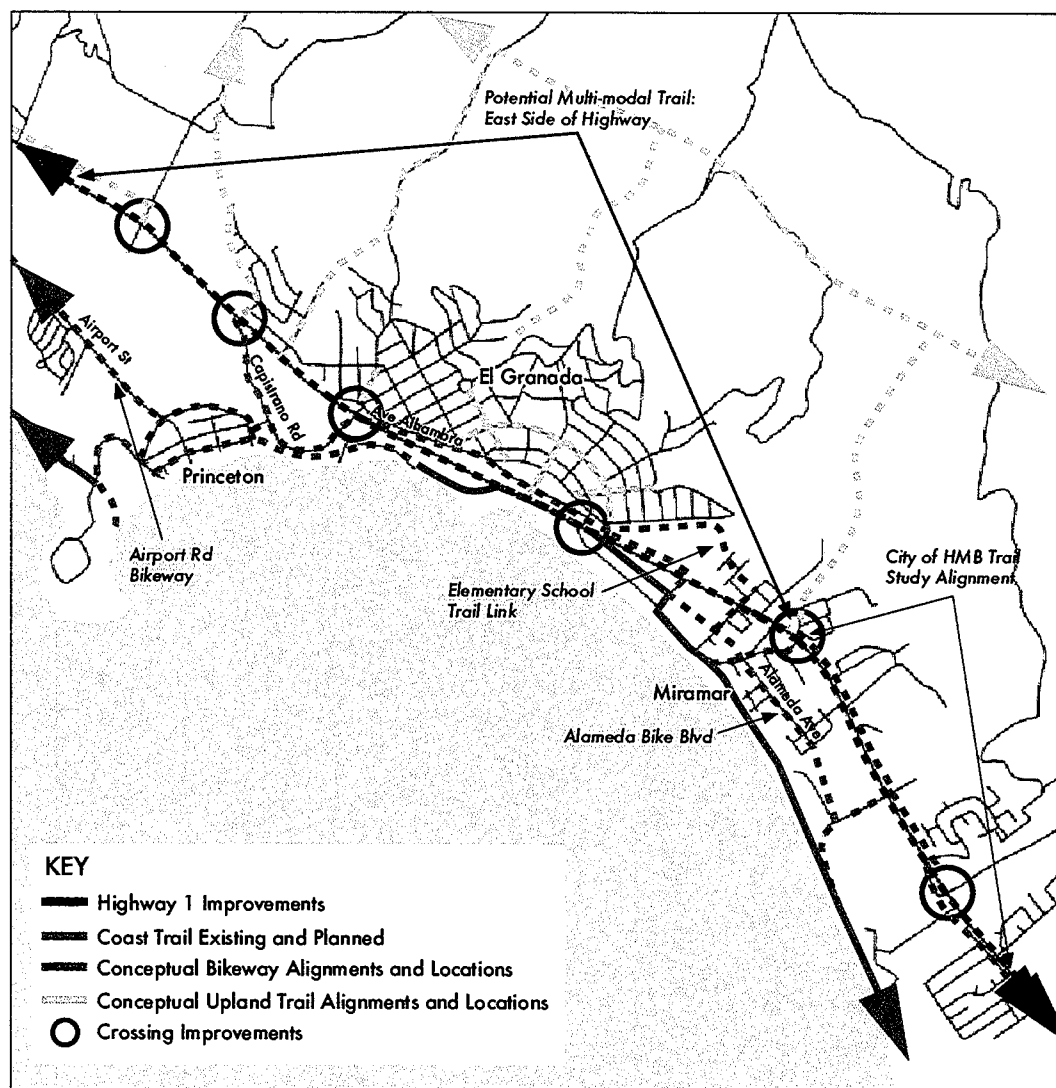


Highway 1 on San Mateo Midcoast

completed and planned paved trail segments provide an accessible pedestrian and bicycle connection between residences, lodging, businesses, services and visitor attractions on the coastal side of the highway. North of Pillar point, rugged and steep terrain allow for hiking and jogging but constrain the trail's potential as a routine travel route for all types of users.

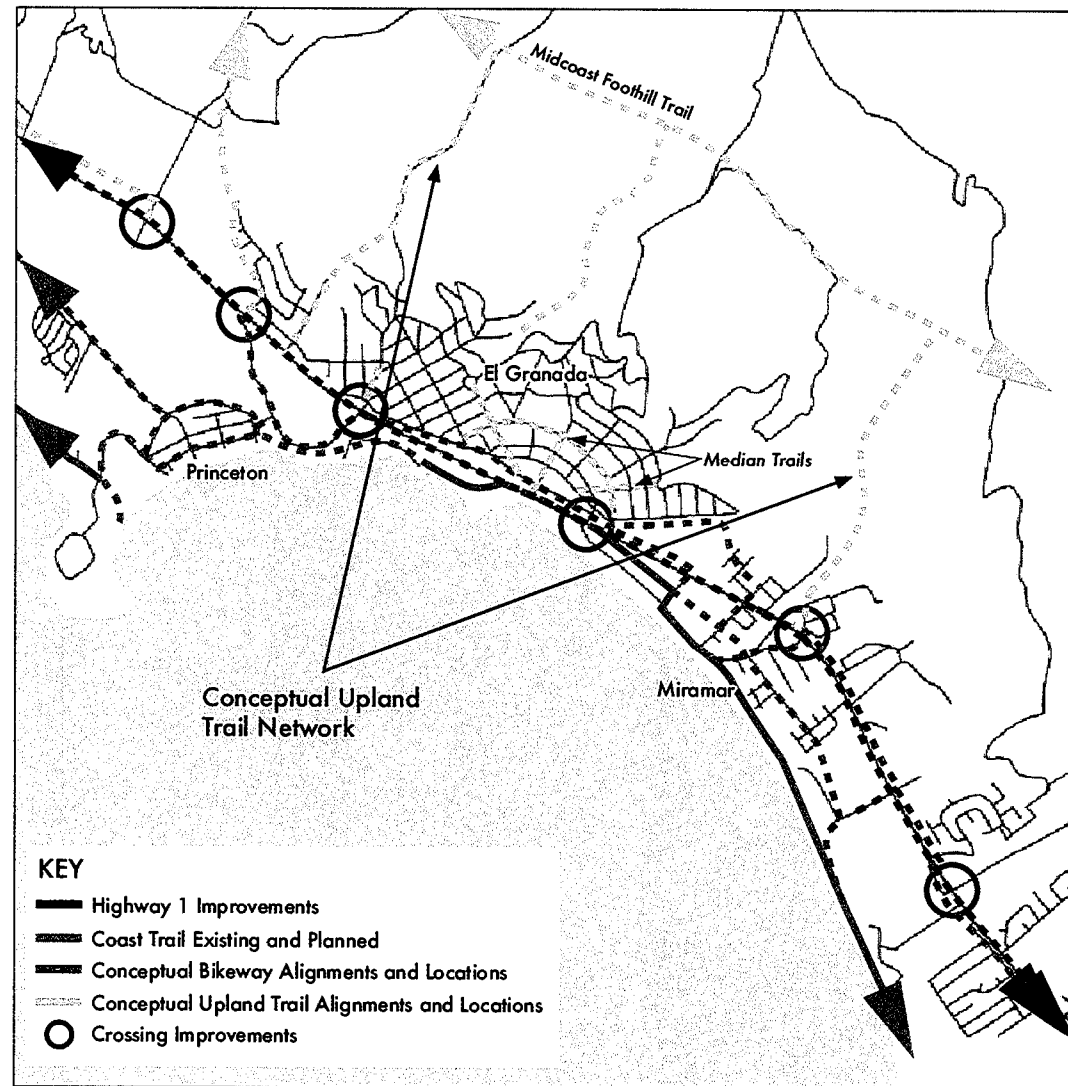
In addition to the Coastal Trail, various studies, including the Highway 1 Trail Concept Study prepared for the City of Half Moon Bay in 2004, envision a continuous multipurpose separated trail for bikes and pedestrians that mostly services the east side of the highway through the study area. Detailed changes could be considered based on local context zones and site constraints, such as the presence of intersections and driveways.

Certain streets could be prioritized for enhancements because of their ability to provide effective bicycle and pedestrian linkages. For example, Airport Street, which is a light traffic road on flat terrain that provides a direct connection with limited cross traffic between Princeton and Moss Beach, could eventually be improved with striped bike lanes or a separated path. Alameda Avenue, a slow speed, low volume residential street in Miramar could be enhanced with signage and treatments to serve as a "bicycle boulevard," in which cars and bicyclists share the travel way.



Based on review of materials from past workshops, review of County parks and trails plans, and input from the charrette, the design team also delineated a tertiary network of upland trails and paths shown on the right that would connect laterally to the coast-side system. The network would include access into future Golden Gate National Recreation Area lands and the Midcoast Foothill Trail. But it would also provide “feeder” access from residential neighborhoods to the main line pedestrian and bicycle circulation system. Broad medians on El Granada’s historic avenues, including Granada, The Alameda, Balboa, Portola and Cabrillo, provide additional opportunities for neighborhood trail connections.

Portions of the trail system would be unpaved and limited to walking, hiking, jogging, and equestrian use, while others may be more intensively structured to enable various types of bicycle use.





What is a Bike Boulevard?

Bicycle boulevards are designated bike routes that are integral to a bikeway system, but may be too narrow for a bicycle lane or have such low vehicle volumes that a bicycle lane is unnecessary. Ideally, motor vehicle traffic is 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.

For more information: <http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=6690>

Shared Pedestrian and Bicycle Trails

Trails shared with bicyclists may be adequate for pedestrians when use rates are low and trail widths ample for users to avoid conflicts. In areas of heavy use, pedestrians and bicyclists should be separated. Any facility designed for pedestrian use must meet Americans with Disabilities Act (ADA) requirements.

Sidewalks should not be designated as bikeways. Trail signing would help distinguish sidewalks from trails.

Equestrians

An equestrian trail parallels portions of the Coastal Trail. Some charrette participants expressed a desire for additional equestrian facilities, and explained they have been gradually losing access to open space. When equestrian trails are provided, they should be separated



Horseback riders and pedestrians share trail at Half Moon Bay State Beach.

from other trail users, except at crossings. Where crossings are paved, designers should work with equestrian experts to develop nonskid treatments for horses.

Summary of Potential Key Trail Links

Princeton

1. Connect Princeton to Highway 1 with a Class II on-street bike lane on Capistrano Road.
2. Connect Princeton to Moss Beach with a Class II on-street bike lane on Airport Street.
3. Long term, develop a Class I bike path along the coast line through Pillar Point Harbor and Princeton.
4. Complete Coastal Trail in phases, beginning by connecting existing sections with bike boulevards and bike lanes. Short and long-term recommendations are currently under exploration by the Midcoast Parks and Recreation Committee Trails Team.

El Granada

1. Provide Class II on-street bike lane on Avenue Alhambra and Obispo, connecting to Santiago Avenue.
2. Connect proposed City of Half Moon Bay trail on the east side of the highway to Mirada Drive to continue to Santiago Avenue.
3. Connect Coastal Trail on west side of Highway 1 through Miramar.

Miramar

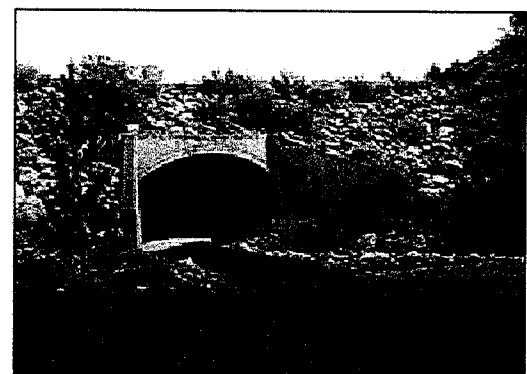
1. Consider replacing the existing corrugated metal culvert under Highway 1 between Furtado Lane and Miramar Drive with a precast concrete system that includes a low flow channel and walking edges. Any such design would have to address ADA issues and have trail connections on both ends. The culvert replacement could accommodate environmental improvements to Arroyo de en Medio that would maintain the integrity of the waterway.
2. Consider designating Alameda Avenue a bike boulevard with an additional non-motorized pedestrian/bicycle bridge across the ravine that divides the west segment of Alameda Avenue from the east segment. Consider adding a trail connection from the east terminus of Alameda Avenue to the Coast Trail/Balboa Boulevard.
3. Provide a trail connection between the elementary school and residential areas to the south on the east side of the highway.
4. Construct the trail planned by the City of Half Moon Bay on east side of Highway 1. Align trail between Nurserymen's service road and Highway 1.
5. Provide link from the above mentioned trail to the Coastal Trail via Mirada Road and Medio Road.



These bicyclists emerged from the Miramar neighborhood east of Route 1 on Medio Avenue, and pedaled against traffic to a culvert, where they crossed under the highway. School children explained during an earlier meeting this is a common, but forbidden, practice. It illustrates the need for a safe and convenient pedestrian/ bicyclist highway crossing in Miramar.

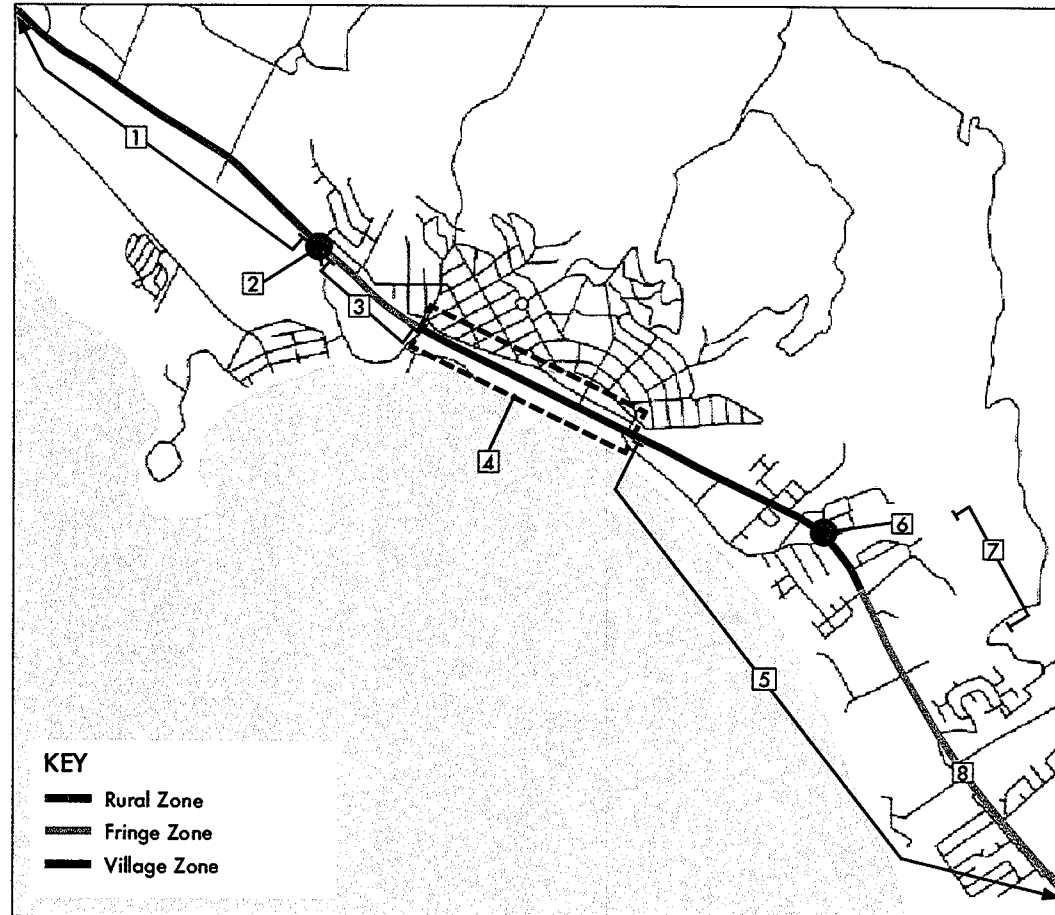


This pedestrian/ bicycle bridge on the Coastal Trail crosses a ravine that would otherwise divide the neighborhood. An additional bridge across the ravine that divides Alameda Avenue would create another north-south connection that spans the length of Miramar.



Improvements to the culvert in the top photo could provide a convenient crossing under the highway. If a crossing is developed, it should also accommodate equestrians, although they may need to dismount to minimize height requirements.

Design Strategies Locator Map



Design Concepts

Based on input from the charrette, analysis of planning data and field review of the study area, the design team prepared a series of proposals to improve mobility for all users along the Highway 1 study area. The concepts employ tools described in preceding pages and some additional strategies selected for specific sites.

The location of specific concepts are enumerated in the diagram on the left and listed below.

1. Apply rural section attributes north of Capistrano Road.
2. Create gateway intersection at north terminus of Capistrano Road.
3. Apply fringe section attributes between north and south terminus of Capistrano Road.
4. Short and long-term concepts to improve multi-modal access, and respond to coastal erosion between Capistrano Road and Coronado Street.
5. Apply village and fringe section attributes between Coronado Street and Frenchmans Creek Road.
6. Redesign intersection at Mirada Road.
7. Consolidate access in front of Nurseryman's Exchange.
8. Consolidate intersections at Frenchmans Creek Road.

1. Apply rural cross section attributes north of Capistrano Road

As shown in Cross Section A on Page XX, typical attributes in this section of the roadway would include 12-foot travel lanes and 6 to 8-foot paved shoulders to provide space on the side of the road to accommodate bikes and pedestrians where there are no trails or sidewalks.

There is an isolated intersection on this section of the highway that provides access to Half Moon Airport on the west side of the highway and access to an agricultural service road on the east side of the highway. The intersection is difficult for motorists to detect and speeds are high on this straight and open section of roadway.

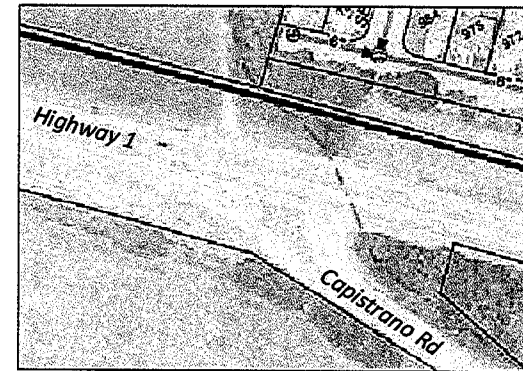
There is a striped median with a left-hand turn pocket northbound on the highway to accommodate left hand turns at the intersection at Half Moon Bay Airport. One strategy to consider to increase visibility and safety would be to change the median to a raised island to facilitate left turn shadowing and positive channelization of turning vehicles. Other treatments could include raising the approach grade of the airport road side street to improve intersection sight distance and promote more efficient turning maneuvers. Localized roadway illumination might also be improved.

2. Create gateway intersection at north Capistrano Road

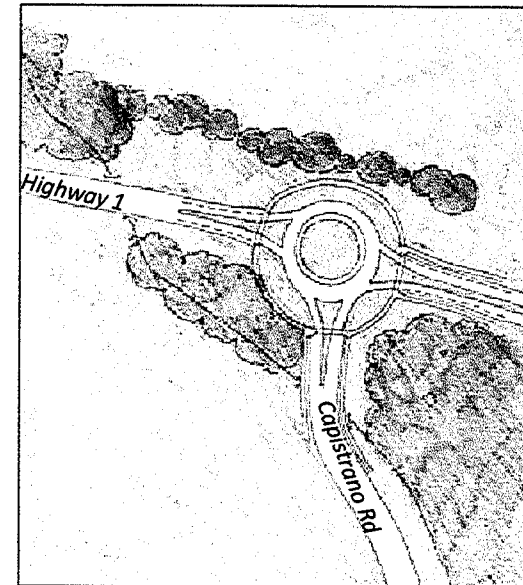
Princeton is a small village on the coast line, north of Pillar Point Harbor, and south of the Half Moon Bay Airport. The village is a mix of residential, light industry, and retail establishments, with approximately 300 inhabitants as of the 2000 census. Access to the village and harbor is from Capistrano Road.

Capistrano Road forms a loop connection to Highway 1 at two intersections, approximately one-half mile apart. The northernmost intersection provides access to Princeton and Pillar Point Harbor. The southern intersection of Capistrano and Highway 1 is the largest of the two intersections and also provides access to El Granada.

The consultant team explored the opportunity to create an entry transition for southbound traffic on Highway 1 at the northern intersection with Capistrano Road. The proposed concept would convert the intersection from a higher speed "Y" intersection to a three-point "T" intersection and install a roundabout. This would help increase motor awareness of an approaching shift in context, facilitate safe turning movements, and increase the prominence of the north intersection as an alternative route to Princeton and the harbor area.



Intersection of Highway 1 with north leg of Capistrano Road



Capistrano Road is shifted south to form a simplified intersection with a roundabout.



Surfer's Beach is a popular City of Half Moon Bay beach located west of El Granada.



Many visitors park on the east side of the highway and then cross to access the beach, trails and harbor.



Erosion destroyed old roadways through El Granada and continues to move toward Highway 1.

3. Apply fringe cross section attributes between north and south terminus of Capistrano Road

Cross Section B, as shown on Page XX, would generally apply to the approach to the southern intersection with Capistrano Road, adding road edge definition to signal the transition from a rural to more urban condition. Introduction of a continuous median will establish a space for designated turning areas and the possibility of paved and landscaped treatments for visual impact, village entry features, and reduced imperviousness for storm water drainage. Formal drainage is added, defining separation between the road edge and adjacent land as development begins to appear.

The addition of sidewalks should be considered in the fringe areas, but may not be required the full length of the road segments on both sides where there are alternative direct ADA accessible walkways to key destinations.

4. Short and long-term concepts to improve multi-modal access and respond to coastal erosion between Capistrano Road and Coronado Street

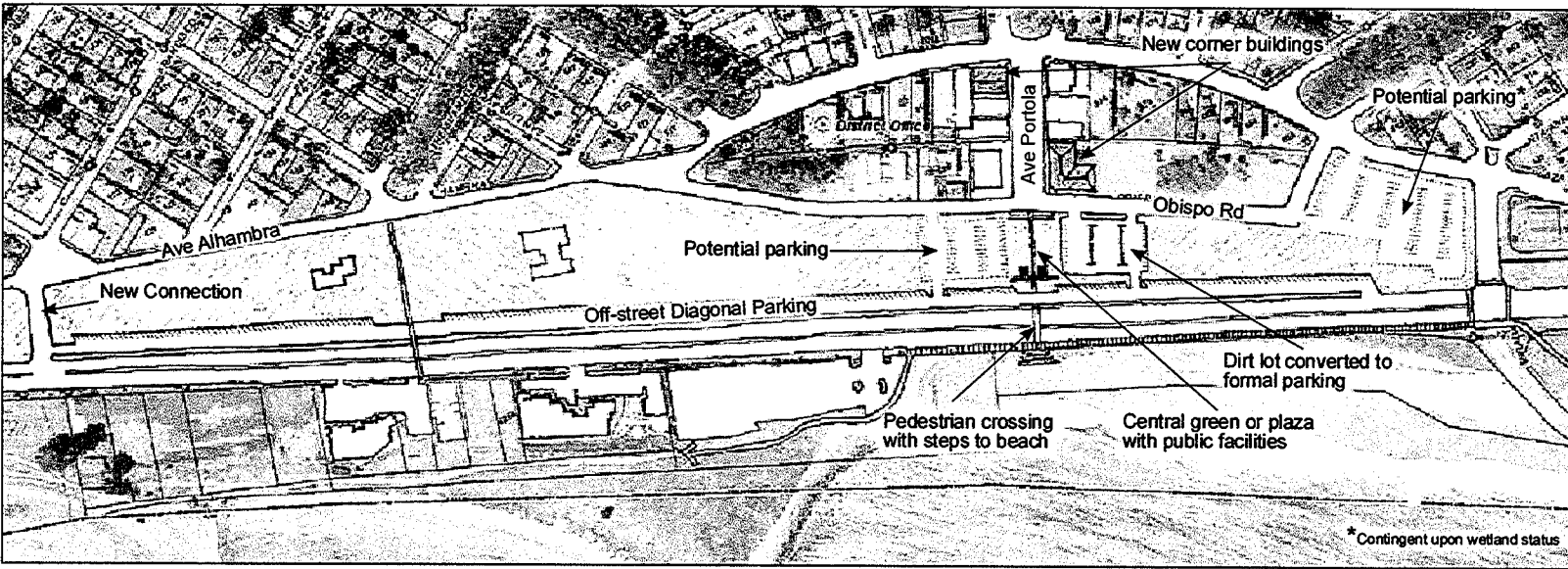
The overall design concept for this section covers areas along Highway 1 from the south intersection with Capistrano Road to Coronado Street. El Granada, the largest of the three coastal villages, lies east of the highway. West of the highway are beach and commercial areas

that are within the jurisdiction of the City of Half Moon Bay and San Mateo County Harbor District.

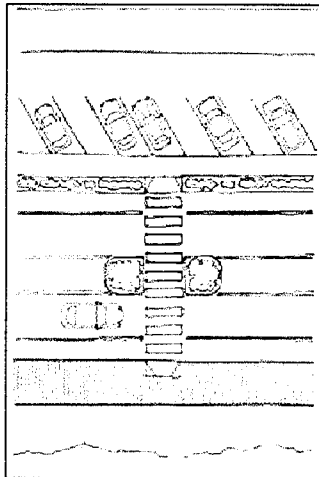
El Granada's distinctive street pattern was planned by Daniel H. Burnham, famed as the "father of the city beautiful movement." Housing was arranged to take advantage of the ocean view. A site originally planned as a casino is now a coveted, mostly undeveloped area locally referred to as the Burnham Strip. The Strip separates residences and businesses in El Granada from Highway 1 and the coastline.

The coastline near El Granada between Pillar Point Harbor and Miramar is eroding and moving toward the highway. Erosion poses access challenges for those who wish to enjoy Surfer's Beach, complicates completing gaps in the existing Coastal Trail, and brings into question how long the existing alignment will remain intact.

The unique challenges between Capistrano Road and Coronado Street resulted in many creative suggestions during the charrette. The consultant team refined this input and developed four concepts for this central portion of the study area. The first concept suggests elements to consider for near-term implementation with the existing roadway alignment. The other three present alternatives that would involve long-term realignment of the roadway.



Plan details are labeled above. A plan view is shown on the left of a midblock crosswalk connecting the parking area to the boardwalk with a channelized pedestrian island.



Section C shown on Page XX, minimum six-foot wide sidewalks should be considered for both sides of the highway, the length of this segment, except where it is supplanted by an adjacent 12-foot wide boardwalk connection between Coronado Street and the Surfers Beach parking lot.

Pedestrian Crossings

Two potential new crosswalk locations are identified at Surfer's Beach and Sam's Chowder House with raised median crossing islands. These islands can be designed with vertical elements and high contrast pavement or landscaping to maximize visibility. Treatments

can be used to narrow the perceived travel way, encouraging driver alertness and caution, and increasing the willingness of drivers to yield to pedestrians.

Both proposed locations should be evaluated for possible installation of a pedestrian signal. An innovative signal has been tested in numerous communities, and may soon be allowed on California highways. It is called a Pedestrian Hybrid Beacon, and nicknamed HAWK. This signal can be used midblock or at intersections. It is dark until a pedestrian pushes the button. It then begins flashing yellow to the driver, turns to a steady yellow, and

then turns to a steady red for the driver, while a WALK symbol (walking man) is displayed to the pedestrian. When the flashing hand is displayed to the pedestrian (which means they can continue crossing, but they cannot enter the crosswalk if they are not already in it), the driver sees a wig-wag red that moves from side-to-side. This indicates the driver may proceed after stopping if the pedestrian has cleared the travel lane. Pedestrian signals are most effective when they provide a “hot call.” This means that the pedestrian pushes the button, and they receive a prompt walk interval. If the signal does not change fairly quickly, and there is a gap in traffic, the pedestrian may cross against the light. Short signal cycles also help prevent pedestrian crossings against the light.

Another innovative strategy for use at unsignalized crosswalks is the rapid flash LED beacon. Recent studies indicate these devices increase driver willingness to yield to pedestrians in crosswalks.

Pedestrian crossings should be illuminated, with light standards placed on all four corners to ensure the pedestrian is front-lit to an approaching driver. Sidewalk and trail lighting can be dark-sky friendly, pedestrian scale lamps to protect ocean and night sky views.

Intersections

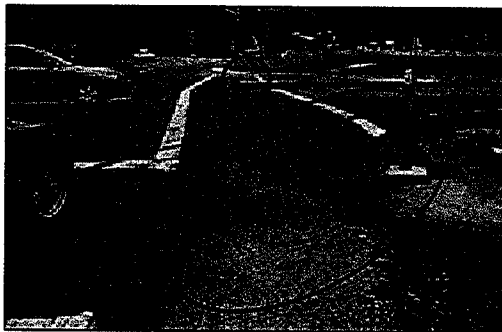
At the intersections with Capistrano Road and Coronado Street, several improvements could

be introduced to reduce pedestrian exposure to traffic and encourage driver awareness and caution.

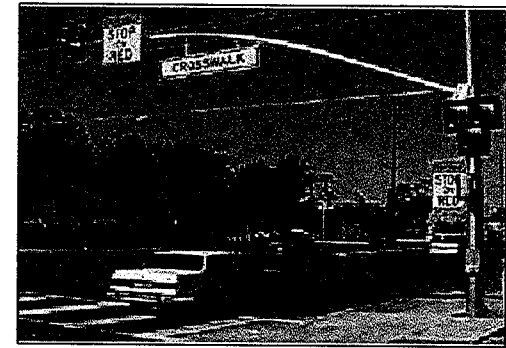
Starting with Capistrano Road, extension of curb and gutter is recommended on both sides of the highway to approximately 500 feet north of the intersection. This will cue motorists that they are arriving at an urbanized intersection at the entryway to El Granada, Princeton and the harbor.

The southwest corner of the intersection needs to be completed with curb and gutter, sidewalk and corner ramps. The median tip in the crosswalk should be removed to provide a clear path for pedestrians.

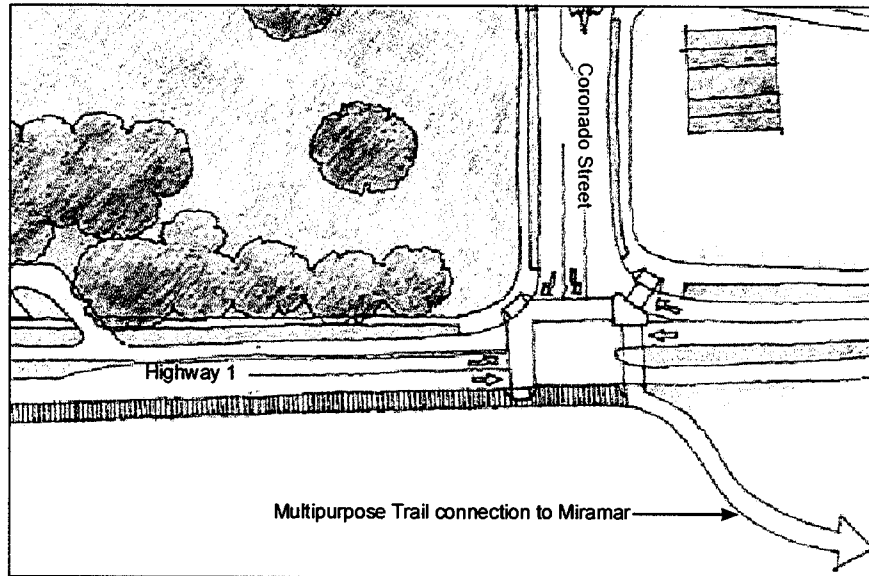
All crosswalks should be re-striped with high-visibility longitudinal markings.



Corner needs to be finished with curb and sidewalk, and median tip should be removed at Capistrano intersection.



Top Photo: Pedestrian Hybrid Beacon, or HAWK. Above and Left: Rapid Flash LED Beacon.



Raised medians on both sides of Highway 1 should be widened and extended. The median on Capistrano on the west side of Highway 1 should be adjusted to straighten the north-south crossing.

At the Coronado Street intersection, recommendations include tightening corner radii and adding a crosswalk to the south side of the intersection. All three crosswalk legs should be striped with high visibility longitudinal markings. The addition of a right-hand slip lane with a elongated island would shorten pedestrian exposure to traffic. It would also shorten pedestrian clearance time from the crosswalk, reducing delay for waiting motorists.

Wayfinding

Signs directing drivers to parking, bicyclists to trails, and visitors to services are needed in the El Granada area. People need information to orient themselves, understand the environment, and find their way to destinations in cars, on foot or bicycle. Signs are an essential component of a wayfinding system, but other elements, such as flags or distinctive architectural features may also provide information. Wayfinding and aesthetic features could send a clear message that there are viable commercial nodes. Wayfinding information can increase walking, bicycling, and transit use. Charrette participants suggested walking could be increased by providing visitors with route maps explaining local points of interest.



Signs help pedestrians and bicyclists select the most appropriate routes and access goods and services along their way. Some wayfinding systems include information such as estimated walking or bicycling time to destinations. Information such as water and restroom locations should be included. Distinctive features such as the archway above add beauty and memorable landmarks to trails and commercial centers.

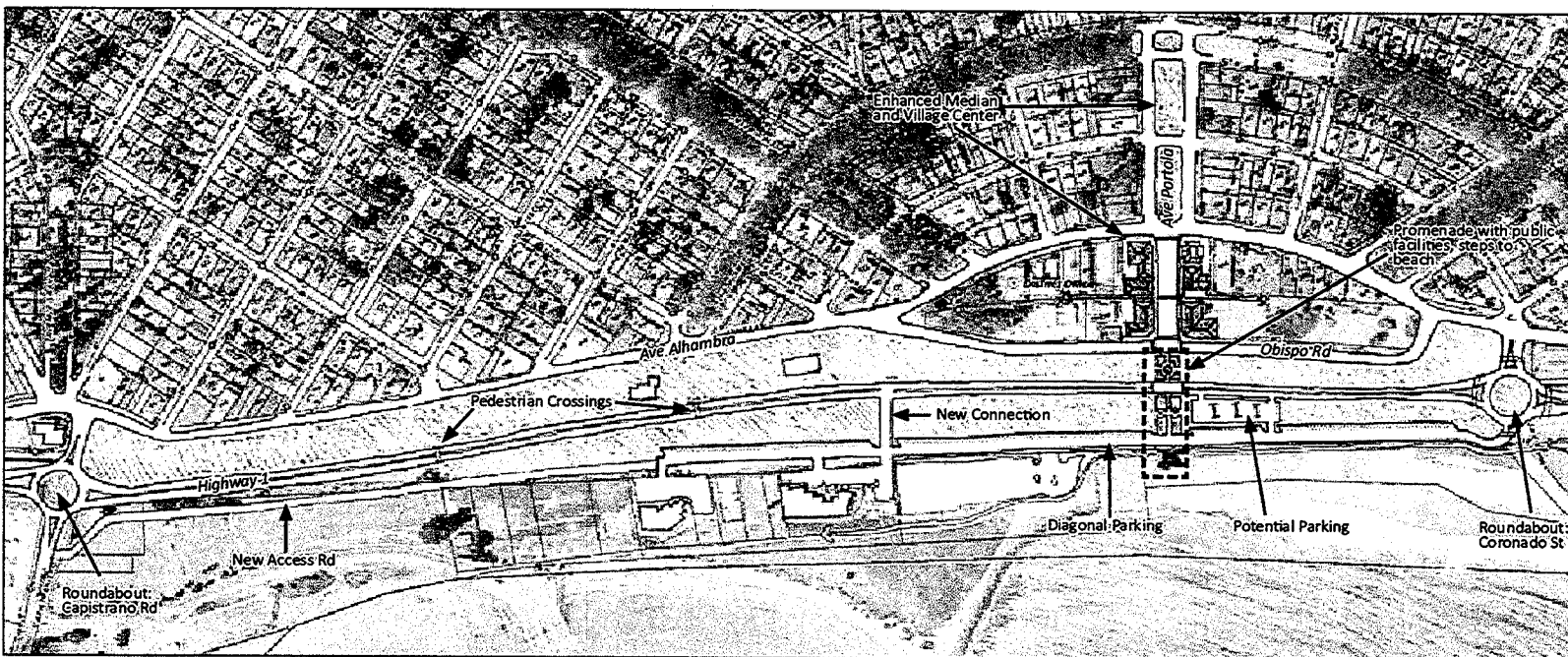


Perspective drawing of El Granada with Highway 1 realigned eastward. A central plaza at the terminus of Portola Avenue is framed by iconic buildings forming a gateway to the coastline and Coastal Trail.

Highway 1 Realignment Study Alternatives

Three long-term alternatives are presented in the pages that follow. All three involve realignment of Highway 1 to address the challenge of coastal erosion and create new opportunities for preservation and restoration of the coastal environment.

All of the concepts address priority issues and reflect suggestions made during the charrette, but not everyone agreed on every proposed improvement. The community will need to continue to discuss attributes of the concepts and work with stakeholders to refine a final plan. It is possible that Concept A could be implemented while the core features and final details of a long-term plan are developed. But it is important to note that the need for a long term realignment alternative may become much more immediate if a storm event occurs that damages the highway in its current location beyond repair.



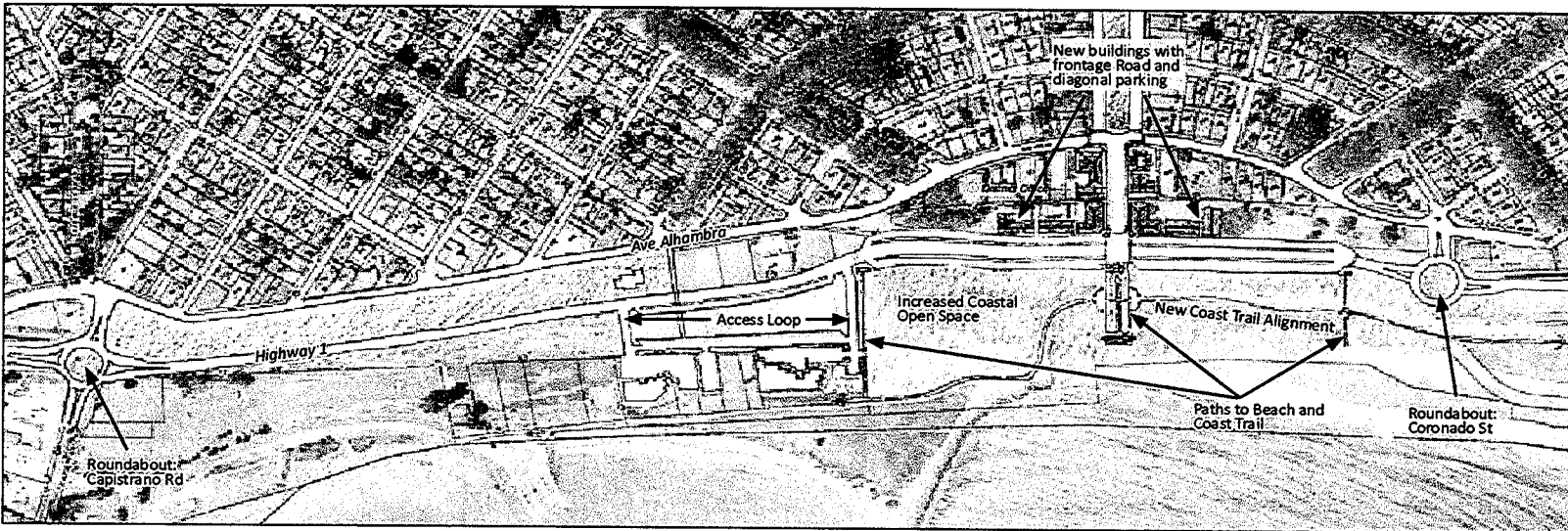
Concept B: Center Alignment

This concept shifts the roadway alignment toward the eastern edge of the Caltrans right-of-way, away from the coastal erosion area. Visitor parking is located on the west side of the highway, reducing some of the demand for pedestrian crossing from the east side of the highway to the beach and other attractions. Additional public parking is also made available for businesses on the west side of the highway, creating potential opportunities to convert some on-site parking to higher and better uses.

Additional elements include:

- A roundabout pair at Coronado Street and Capistrano Road would facilitate U-turns and circulation.
- The old roadway is narrowed and retained for parking, access and provides and emergency alternative route.
- The link between Highway 1 and an access road would improve traffic circulation.
- Connects Coastal Trail with a boardwalk between existing segments.

- A buffer is maintained between the village and highway.
- A landscaped promenade between beach parking and Portola Avenue would encourage a village main street environment to promote economic growth and focus on historic features.

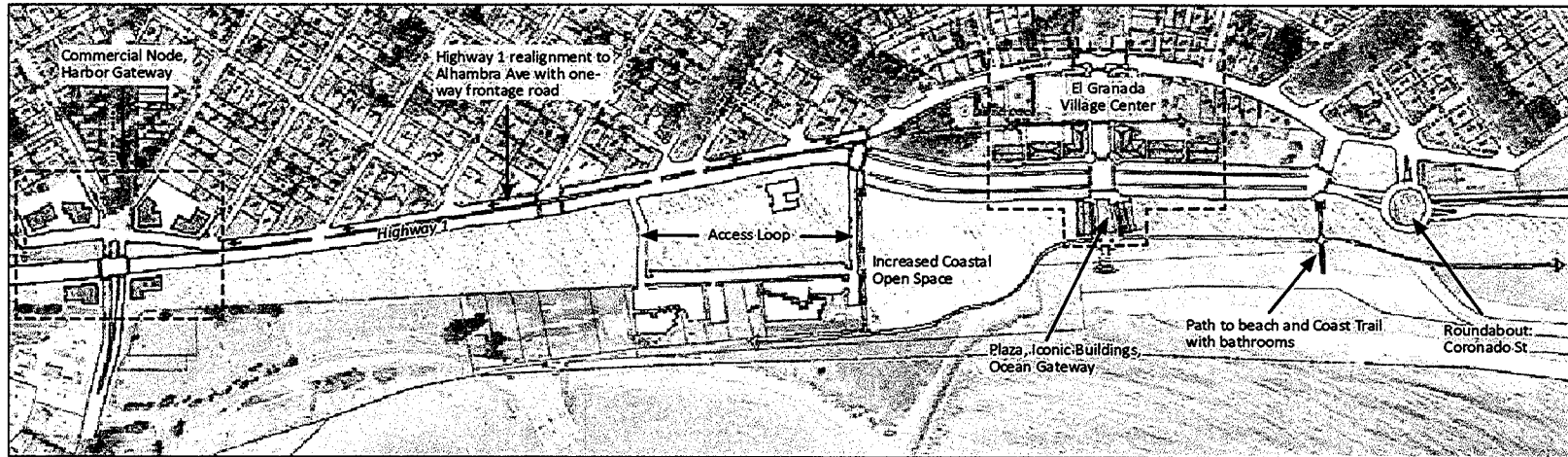


Concept C: Center/Obispo Alignment

This concept shifts the roadway alignment to the eastern edge of the Caltrans right-of-way and beyond for a portion, with parking concentrated on the east side of the highway. This adds a buffer of restored open space between the eroding coastline and the roadway. It also creates an opportunity to increase the significance of central El Granada as a viable commercial village core.

Additional elements include:

- Installation of roundabouts at Coronado Street and Capistrano Road pair to facilitate U-turns and circulation.
- Realignment of Highway 1 away from coastal erosion area to the edge of the Caltrans right-of-way, then moved farther east to align on Obispo Road.
- Diagonal on-street parking on both sides of the highway with access roads in the village core.
- Abandonment of the old highway and creation of an access loop to coastside businesses.
- Enlargement of open space west of the highway which could be used to reestablish native plant systems and possibly dunes to combat erosion.
- Re-routing of the Coastal Trail through open space.
- New highway alignment would bring traffic and parking closer to a compact village center which may stimulate economic growth and concentration of local services within walking and biking distance of residences.

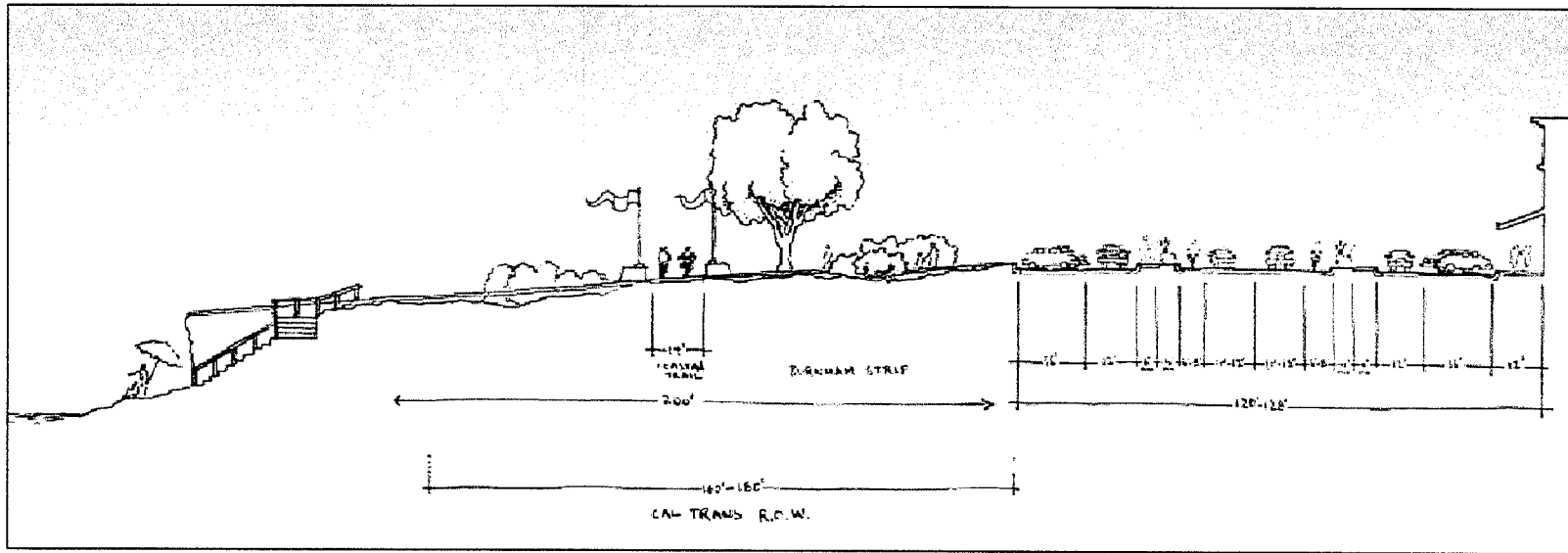


Concept D: Avenue Alhambra/Obispo Alignment

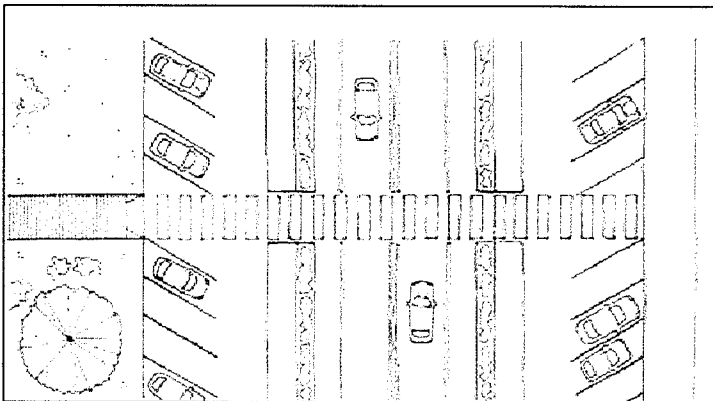
This concept re-routes Highway 1 through the existing alignment of Alhambra Avenue and Obispo Road. The three roadways would be unified into a single roadway with adjacent frontage roads for circulation and parking. Appropriate-scaled and designed development could occur on the west side of the El Granada Village Center, that would frame a public area suitable for outdoor gatherings, entertainment, a farmers markets and other events.

Additional elements include:

- Realignment of Highway 1 away from coastal erosion area outside of the Caltrans right-of-way.
- Separation of the highway from El Granada by a one-way frontage road.
- As in Concept C, there is angled on-street parking on both sides of the highway with access roads in the village core.
- As in Concept C, a section of the old highway would be converted to diagonal parking with an access loop to coastside businesses.
- As in Concept C, open space would be increased west of the highway which could be used to reestablish native plant systems and possibly dunes to combat erosion.
- The highway alignment would bring traffic closer to the village center and commercial development on the east side of the highway at the intersection with Capistrano. This can help stimulate existing and new development that can fulfill more shopping and services needs locally, reducing the need for travel to other communities.



Cross section illustrating basic features of Highway 1 realigned through El Granada.



Plan view of a mid-block pedestrian crossing in the El Granada Village Center.

As shown in the illustration above, the roadway in the El Granada Village Center area would include separated access roads on both sides of the highway with diagonal parking. Sidewalks and bike lanes would be included on both sides of the highway. Travel lanes might be reduced to 11 or 10 feet to facilitate a slower speed environment and shorten pedestrian crossings. Roadway dimensions could be adjusted to include a center median to separate traffic, facilitate pedestrian crossings and provide a space for landscaping, signage and other elements.

West of the roadway, much of the Burnham Strip would be combined with coastal land to create a wider, unified area of open space west of the highway that would continue to provide open views of the landscape and coastline from the roadway and El Granada.

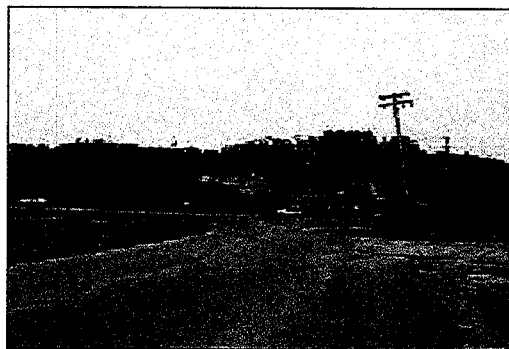
5. Apply village and fringe cross section attributes between Coronado Street and Frenchmans Creek Road

The coastal village of Miramar lies between the southern study area boundary, Frenchman's Creek Road, and the coastal village of El Granada. As shown on the location map, the village has a fringe zone on the southern end, but blends into the village of El Granada in the north. Miramar is primarily residential, with a commerce node along the highway near the intersections of Mirada Road and Guerrero Avenue, and small establishments along the coastline. Nurserymen's Exchange, a wholesaler, is located on the east side of the highway. Portions of Miramar are unincorporated, but areas south of Mirada Road are within the City of Half Moon Bay.

Village Cross Section C would generally apply between Coronado Street to approximately 500 feet south of Roosevelt Boulevard. Fringe Cross Section B would generally apply from the Roosevelt Boulevard area southward to Frenchmans Creek Road. A median, bike lanes, and shoulders finished with a concrete edge (valley gutter or curb and gutter) is recommended from Coronado Street to Frenchmans Creek Road.

Walkways are needed throughout the Miramar segment, but further study is needed to

determine appropriate roadway segments for the addition of sidewalks. Sidewalks adjacent to the highway would be appropriate and are generally recommended from Coronado Street southward to at least the terminus of the restaurant parking lot south of Roosevelt Boulevard. However, variation in uses and location of development may make sidewalks adjacent to the roadway less practical in some locations. As noted previously, wide areas of land between the roadway and property lines might provide space for the development of parallel trails that can accommodate pedestrians. For example, the City of Half Moon Bay Trail Study envisions a multipurpose trail alignment along the east side of the highway to the City boundary at the Mirada Road/Alto Avenue

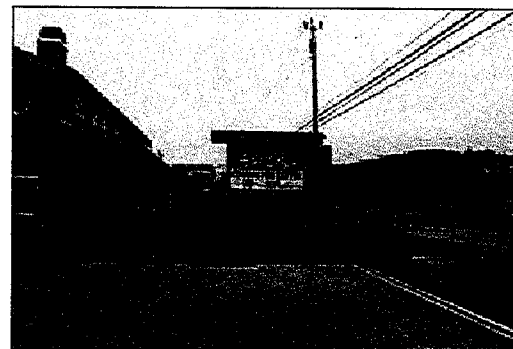


Mirada Road looking east toward the highway. Vacant land suggests potential infill opportunities for local and visitor-oriented commercial development, accessible from neighborhoods by foot or bike, as well as the highway.

intersection. This alignment could be extended northward to link to other pedestrian and bikeway connections.

6. Redesign Intersection at Mirada Road

Lodging, restaurants, a cafe and nursery, and small vacant buildings form a commercial hub on the west side of Highway 1, south of the intersection with Mirada Road. Highway 1 has a curved, super-elevated (embanked) segment just north of the intersection with Mirada Road. This contributes to a high speed environment. Vacant land, poorly defined corners at the intersection and multiple, wide commercial driveways create numerous hazards for drivers entering and exiting Mirada Road and accessing



Recent new development near the southwest corner of the intersection with Mirada Road. Highway 1 is visible on the right.

nearby services, and for higher speed through motorists as they encounter slower moving turning vehicles.

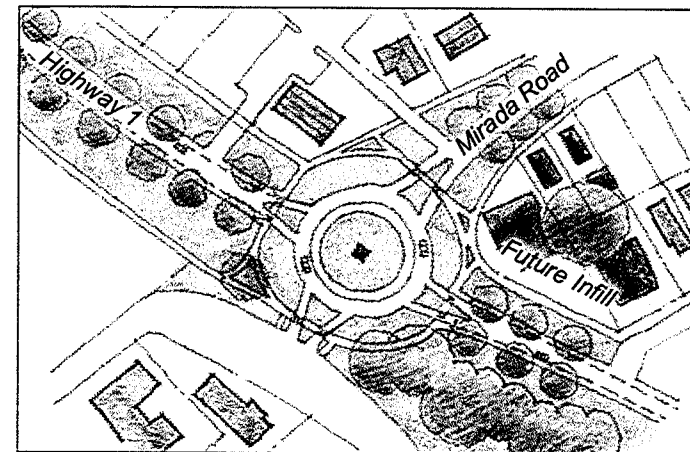
Installation of a roundabout at this location would assist drivers trying to merge with Highway 1 traffic and maintain slower speeds. It would also facilitate safe crossings for pedestrians and bicyclists. Finally, improving conditions at this intersection with a roundabout would promote infill opportunities for enhanced commercial development, and help the area evolve into a viable, pedestrian-oriented village center.

7. Consolidate access in front of Nurserymen's Exchange

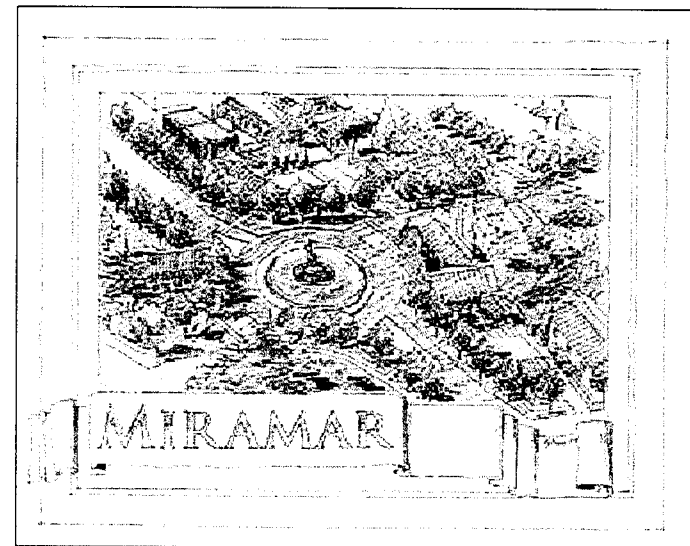
Currently, parallel informal, gravel drives provide access to Nurseryman's Exchange operations and facilities on the east side of Highway 1, roughly between Guerrero Street to the north and slightly south of Young Avenue to the south. The drive is discontinuous and punctured by many access points to the highway.

As noted previously, a City of Half Moon Bay trail study proposes the alignment of a trail on the east side of the highway in front of the Nurserymen's property. Implementation of this trail could occur in tandem with a consolidation of the many service access points along the Nurserymen's property into a continuous structured access road of uniform width and material and limited access points. This service road could begin at the Young Avenue intersection to the south and continue northward to at least Roosevelt Boulevard and perhaps continue on to Guerrero Street or even Mirada Road/Alto Avenue.

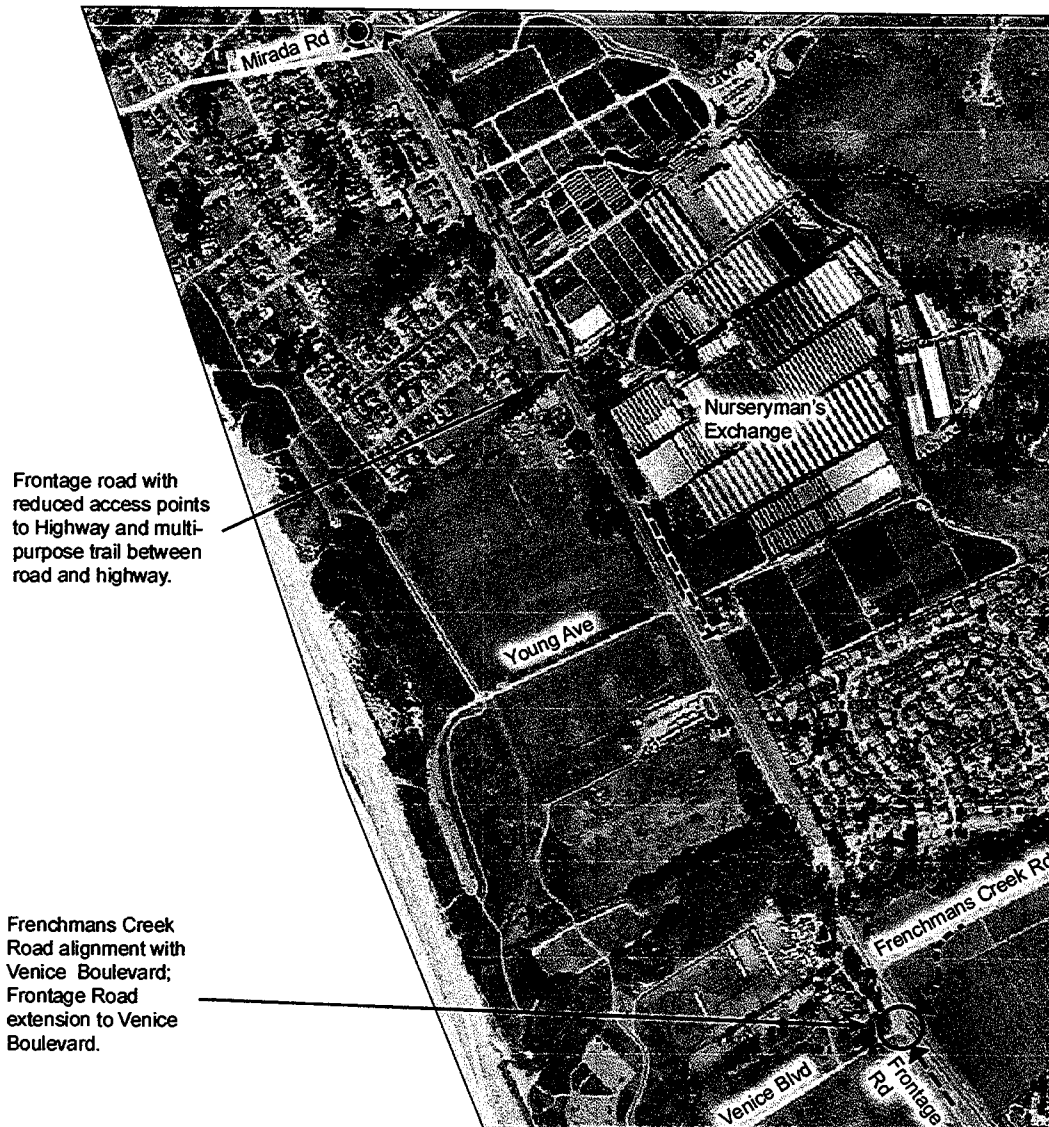
The median between the highway and the service road could integrate the off-street trail with pedestrian amenities such as lighting and landscaping. Limiting the access points for industrial vehicles would



Plan view of roundabout at Highway 1 and Mirada Road.



Perspective view of future village center.



make this route safer for pedestrians and reduce the number of turning conflicts with the highway.

8. Consolidate intersections at Frenchmans Creek Road

Another possibility to consider for consolidating access points on Highway 1 exists at Frenchman's Creek Road. The road intersects and terminates at the highway from the east. Approximately 300 feet to the south, Venice Boulevard intersects and terminates at the highway from the west. Frenchmans Creek Road could be realigned southward to connect with the existing alignment of Venice Boulevard. Frontage Road, which runs parallel on the west side of the highway providing access to a residential subdivision, could be extended approximately 400 feet to the north to join at Venice Boulevard. The current intersections at Frenchmans Creek Road, Venice Boulevard and Frontage Road would be consolidated into a single unified intersection.

The proposed strategy would establish the prominence of Venice as a primary access route to state beaches, parking, the Coast Trail and equestrian paths. In the long term, the intersection could be enhanced for pedestrian crossing and eventually meet warrants for signalization.

Appendix

Implementation: Action Plan

The action table below proposes tasks be accomplished in the following time frame:

Short Term: 0 - 2 years

Mid Term: 2 - 5 years

Long Term: 5 - 10 years

Category	<i>Suggested Action/Strategy</i>	<i>Time Frame</i>
Policies and Studies	Explore Route 1 freeway/expressway re-designation to highway designation	Short Term
	Conduct parking study to assess needs and identify preferred sites, size and configuration	Short Term
	Review and refine potential future highway realignment alternatives	Short Term
	Study feasibility of roundabouts at Capistrano (north) and Mirada Road	Short Term
	Review and revise local coastal plan to direct infill development into Village Centers	Mid Term
	Consider creation of form-based code to implement infill development in village centers and residential locations	Mid Term
	Prioritize bikeways and trail connection links for improvements	Short Term
Corridor Improvements	Stripe bike lanes and medians on Highway 1 per recommended context appropriate cross sections	Short Term
	Improve crossing treatments at Capistrano Road and Coronado Street	Short Term
	Complete 400' portion of trail linking the Coastal Trail between Surfers Beach and Coronado Street	Short Term
	Construct sidewalks and edge treatments both sides of Highway 1 per recommended context appropriate cross sections	Mid Term
	Install flush and raised median treatments	Mid Term
	Install one or more mid-block crossings in El Granada	Mid Term
	Construct preferred parking alternative in accord with San Mateo County Sustainable Green Streets and Parking Lots Design Guidelines	Mid Term
	Consolidate driveways and parking lot entries in Miramar and El Granada	Mid Term
	Improve frontage drive at Nurseryman's Exchange	Mid Term
	Raise approach grades at the Airport intersection, Magellan and Medio Avenues, and Mirada Road to highway grade level	Mid Term

Category	<i>Suggested Action/Strategy</i>	<i>Time Frame</i>
Corridor Improvements	Realign Frenchmans Creek Road to Venice Boulevard	Mid Term
	Install roundabouts	Mid Term
	Construct highway realignment and intersection improvements	Long Term
	Implement coastal open space restoration	Long Term

Process Notes

Community Workshop

Thursday, June 25, 2009 7 - 9 PM

El Granada Elementary School

The participants were asked to write the values they consider most important in one or two words for the community on separate sticky notes. They then placed each value on a wall next to values that were the same or that most closely resembled their own. Top values included:

- Nature/Wildlife
- Ocean
- Community/Friends/Family
- Walk/Bike
- Quiet/Peaceful
- Open Space
- View/Beauty Recreation
- Fresh Air
- Beach
- Safety
- Weather
- Schools

The participants created a list of issues and ideas to address through a rapid brainstorming session, then identified their top choices with voting dots. These included:

1. Parallel trail to Highway 1 for pedestrians and bikes
2. Preserve/protect view corridors
3. Easier access to the beaches

4. Preserve agricultural, rural qualities
5. Design of trails for different types of users
6. Native plants
7. Pedestrian tunnel or overpass
8. Eastside trail that includes hills
9. Low cost solutions
10. Balance needs of residents and visitors
11. Reduce light pollution
12. Low impact, low asphalt, meandering trail design
13. Restrooms, trash receptacles, tables and benches
14. Include Princeton in study area recommendations
15. Trail to Mavericks with parking off the highway
16. Clustered community services
17. Separate identity for communities

Saturday Community Walk and Design Ideas

Saturday, June 27, 2009 9 am - 2 PM

El Granada Elementary School

The participants broke into two groups and walked the El Granada neighborhood near the elementary school and Highway 1 near the intersection with Coronado Avenue. Afterwards, they viewed a training presentation and worked in groups around table maps and suggested improvements in the study area. Key suggestions and discussion points are summarized below.

Group 1

- Crossing in Miramar: improve culvert under road for safe undercrossing
- Improve beach access off Coastal Trail.
- Miramar surf east dirt parking lot improvement.

- Safer crossing at Magellan.
- Looking for bike lanes both sides of highway 1.
- Bike trail along highway 1.
- Surfers Beach area: move highway east into right-of-way; create median. Allow parking on west side up to the point of Surfers Beach turnout, then drop off structure on the east. Looking for an opportunity for a drop off area to be used by both north and southbound traffic – a turnaround to avoid left turn into drop off area.
- Consider circulating shuttle to serve harbor and Oceano Hotel parking areas.
- Longer term, more parking up toward airport.
- At end of Coral Reef Avenue provide one trailhead from Rancho to provide open space access.
- Coastal trail branches off, going through harbor district either on Princeton or in front of Ocean Blvd. Long term, trail continues up to Pillar Point Marsh.
- Provide parking across from little shopping area at Portola.
- Notes on maps: First Aid, trash/recycling, water/toilets, shuttles for major events, benches.
- Frenchman Creek pedestrian access improvement.

Group 2

- Coastal trail is currently in place.
- Add commuter trail parallel to highway 1 from Princeton harbor to Frenchmans Creek with physical barrier between hwy 1 and trail.
- Some conception plans for oceanside boardwalk.
- Heart of El Granada – looking at Surfers Beach, Sam's Chowder House to Coronado, move highway back 100 to 200 yards. Use roundabouts at connections.
- Narrow Ave Alhambra with bike trail/walking.
- Feeder trails, benches, tree cleanup in major corridors.
- Tourist industry along new highway.

- Crossings to allow people to access beach – see lights on map.
- If we move the road back people have 3 different access points.
- Don't want cement – we want an amphitheater and access to beach where people can congregate.
- Take advantage of community tourism and coastal trail.
- Segment south of Princeton to harbor district, need to bring through to Pillar Point Bluff where it is complete. Have harbor district support for bringing trail through harbor line, but at north end of parking lot there is a bottleneck in front of Oceano Hotel, Fish Trap, brewery; sidewalk narrows and doesn't work at all for pedestrians or bikes. There is a congestion problem. Bring a boardwalk behind Fish Trap, connect to vacant lot and run frontage trail along coast line. A second bridge over the creek, two bridge points connected to boardwalk. In the interim come up Princeton Avenue until funds are available to construct the boardwalk. The Coastal trail is all about having the trail where you can see the water. The interim trail won't have a view, but hopefully it would be a short term solution.
- Bridge creek and tail end of Broadway.

Group 3

3 year plan:

- To replace the broken stairs at Mirada and Magellan, great access could be made with a few loads of gravel dropped at the beginning of every year right by the ancient bridge.
- Another problem is there is no rest room – would be nice to have a bathroom walking distance from the beach.
- Surfers beach - possibility for bathroom: the problem to deal with is the connector between where sidewalk ends and the intersection. A temporary bridge with little impact could be built using telephone poles in the ground with a boardwalk over that riparian area.
- Surfers beach – a similar wooden ramp temporary solution could be used. It would have to be redone in a year or two.

Next layer (longer term ideas):

Highway 1 on San Mateo Midcoast

- Traffic circle to separate traffic into two separate lanes of one-way traffic – north bound on business side; break off parking lots. Use permeable parking lots and trees. Try not to block view corridors with parking lots. Some of the problems with this is that having one way traffic on this stretch of Alhambra would create problems with residential area. Broke it off at Coronado.
- Create a median in northern section of highway 1. Talked about bringing promenade down to beach; at high tide stairs go directly into water.
- Suggestion on the bluff, in the Caltrans right-of-way below the schools you can fairly easily make a parking area that comes in at that point and would accommodate about 90 cars.
- In discussing parking we tried a scheme within the Caltrans right-of-way to maintain the two lane program and have more parking on the street on Obsipo. This would feed the beach promenade and business district.
- In Princeton we wanted to look at how different people use bike paths. Using the roads by Mavericks, we would make that nice bike paths where people could ride with their kids.
- Make sure we have signs about recreational opportunities, like kayaking.
- On Rancho Corral de Tierra POST property comes to corner. Need a pedestrian trail on Alcatraz. Vehicles access Corral Reef.
- Slow traffic on highway 1.
- Safer access onto highway 1.
- Pedestrian and bike tunnel under bridge on top of rise.
- Bike path going down to Frenchmans creek.
- A lot of people working at the nursery walk along highway to get to/from home. Bike/pedestrian trail along highway 1.
- No connections from Mirada to existing trails
- Mirada Road, no place for pedestrians except in the street.
- What about the special events on the coast and that will probably increase?

Charrette Participants

Dorothy Baughman	Christine Granahan	Barry Parr	Leonard Woren
Yvonne Bedor	Michael Granahan	Dennis Paul	Jan Wyer
Yuonru Bedos	Lisa Grote	Paul Perkovic	
Jim Blanchard	Stuart Grunow	Jenn Petrie	
Bruce Blarnerhorn	Kim Harrington	Tom Pohl	
Merrill Bobele	Samantha Havens	Robin Pon	
L.E. Boydston	Elizabeth Hennings	Chris Powell	
Sabrina Brennan	Manu Hipkins	Helen Rogers	
Amy Broome	Dave Holland	James Ryan	
Stuart Brunow	Nancy Hornor	Bob Ryerson	
Paula Burns	Don Horsley	Laura Sanders	
Jo Chamberlain	Joseph Hurley	Ron Sanders	
Elaina Cuzick	Tyler Jackson	Mechan Scanlon	
Michelle Daher	Patric Jonsson	Cathy Schultz	
Yuri Daher	Paul Keel	Leni Schultz	
Mary DeLand	Joanne Kerhavez	Paul Shenkmans	
Carla Edwards	Lisa Ketcham	Diane Shu	
David Edwards	Jerry Laster	Kurt Simrock	
Grey Edwards	Anna Lee	Kathryn Slater-Carter	
John Edwards	Doris Lee	Jan Slegmaies	
Robert Edwards	Sung Lee	Mark Slegmaies	
Guy Elus	Margot Lowry	Steve Slowika	
Sandy Emerson	Constance Malach	Aprile Smith	
Gael Erickson	Charise McHugh	Bern Smith	
Len Erickson	Neil Merrilees	Bill Sorfleet	
Marisa Espinosa	Claudia Miller	James Stanton	
Joel Farbstein	Norma Miramontes	Sandra Tate	
Lyndall Ferb	Steve Monowitz	Beth Thomas	
Laura Fernandes	Tracy Morish	Mike Thomas	
Ben Forchini	Sherry Morrish	Carolann Towe	
Andrew Georgeades	Duat Nguyen	Sanda Trotter	
Steven Goldberg	Peggy O'Leary	Elizabeth Vespremi	
	Joanna Parness	Laslo Vespremi	
	Richard Parness	Dianne Whitaker	

Concept A retains the existing roadway alignment, and is a candidate for early, phased-in implementation. Informal parallel parking is removed from the highway shoulder and unpaved areas beyond the shoulder and organized into diagonal parking east of the highway with a one-way northbound access way. A new connection allows traffic from the parking the area to access Alhambra. Additional parking lots are accessible from Alhambra and Obsipo.

Above: cross section for Highway 1 between Surfers Beach parking lot and Coronado Street.

Local Government Commission