

San Mateo County State Route 1 Repair Guidelines



Prepared by the
California Department of Transportation, District 04



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San Mateo County State Route 1 Repair Guidelines

San Mateo County, California

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Caltrans District 4

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A Note to the Project Development Team

FROM HELENA “LENKA” CULIK-CARO:

I am pleased to present the San Mateo State Route 1 Repair Guidelines. Consistent with Caltrans’ Strategic Plan, these guidelines will help promote stewardship and sustainability of the San Mateo coastline and its natural resources, while maintaining critical infrastructure and streamlining projects through a shared vision with our partners. The shared vision promotes sustainability by reducing environmental impacts through design flexibility and implementing context sensitive solutions.

The objective of these repair guidelines is to provide guidance that integrates and balances safety, mobility, and maintenance goals with environmental values. This document provides a framework to enable more timely repairs that are not only functional but are also consistent with the landscape, uses, and regulatory and land management policies associated with State Route (SR) 1. This allows Project Development Teams to have a shared understanding of practices and features best suited for the SR 1 corridor. With a corridor-centric approach, all those who work on repair projects on SR 1 in San Mateo County share a common vision rather than approaching each project with separate design considerations. This vision not only bridges Caltrans functional units, but also supports and connects the requirements of the California Coastal Act, State Scenic Highway Program, San Mateo County General Plan and Local Coastal Plans, and State Park Services, and is supported by Caltrans’ policy of Context Sensitive Solutions and the Highway Design Manual’s flexibility guidance.

These guidelines, as put into practice, will help promote the organizational excellence goals of Caltrans and help Project Development Teams produce a quality project. Thank you for your hard work, public service, and dedication to serving the people of California and providing a safe and reliable transportation network that serves all people and respects the environment.



Helena “Lenka” Culik-Caro
Deputy District Director, Design
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Chapter 1 Purpose

The purpose of these *San Mateo State Route 1 Repair Guidelines* (Guidelines) is to provide California Department of Transportation (Caltrans) staff and stakeholders with a consistent vision and direction when working on or reviewing damage repair projects along State Route (SR) 1 in San Mateo County (Figure 1-1). Although this damage is predominantly related to storm events, the recommendations apply to any major event that damages SR 1 in San Mateo County (post mile [PM] 0 to PM 48.5)¹. The Guidelines allow Caltrans District 4 and its partner agencies to respond with timely and consistent efforts to repair projects in a manner that minimizes alterations, acknowledges the special sensitivity of this segment of SR 1, supports the existing aesthetics, and protects or enhances conditions for coastal resources while meeting the needs of all user groups.

Discussions with the California Department of Parks and Recreation (State Parks), San Mateo County, and the California Coastal Commission (CCC) helped identify the great need for shared damage repair guidance. Because there are currently no SR 1 corridor-wide recommendations, none are available to be used as references for Caltrans staff and partnering agencies when considering potential treatments for damage repairs.

To respond to these concerns, Caltrans convened an interdisciplinary working group with these partners to create recommendations that maintain sensitivity to the SR 1 corridor's social, historic, scenic, and environmental values while also protecting the safety of users. The objective is to provide guidance that Caltrans and its partnering agencies can reference to promote efficient, appropriate repairs to this highly valued highway. The Guidelines reflect compromises made by all partners to find consensus, and to provide more suitable design guidance to Project Development Teams (PDTs) working on repair projects along the corridor. Projects designed and developed pursuant to these guidelines better protect coastal resources and are typically eligible for more streamlined permitting.

¹ <https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=026e830c914c495797c969a3e5668538>



Figure 1-1 SR 1 in San Mateo County

Chapter 2 How to Use these Guidelines

These Guidelines have been developed to provide consistency and clarification in design development for Caltrans roadway damage repair projects in San Mateo County along SR 1. They are intended to be used as a set of instructions by PDTs for damage repair projects. Damage repair projects are typically spot improvement projects no more than 0.5 mile in length. They may or may not involve structures, such as bridges or retaining walls. Although these Guidelines target storm damage repair projects, they contain information that will benefit all projects being considered in the scenic coastal environment.

These Guidelines are intended to instruct PDTs on how to align the design of repair projects with the existing transportation needs of SR 1 while preserving and enhancing the resources and aesthetics of the project location. Applying these approaches should also streamline the process for meeting the requirements for local, state, and federal approvals of projects along SR 1. This chapter provides a brief description of each remaining chapter in the Guidelines, along with the target audience for each chapter.

2.1 Chapter 3 – Environmental and Permitting Considerations

Chapter 3 outlines the issues and key players involved in the project development process. Staff involved in developing projects along SR 1 in San Mateo County should thoroughly understand this section. The District’s Office of Landscape Architecture and Division of Environmental Planning and Engineering will be able to answer any additional questions regarding individual project issues and solutions.

2.2 Chapter 4 – Process

Chapter 4 covers the fundamentals of the project development process for damage repair projects. Staff involved in developing projects along SR 1 in San Mateo County should thoroughly understand this section. The District Maintenance Office and District Design Liaison will be able to provide additional details.

2.3 Chapter 5 – Design Guidelines

Chapter 5 contains specific recommendations regarding the design of the permanent restoration portion of a damage repair project and is the essence of this document.

Recommendations can be specific or general in nature; the designer should use judgment when applying these recommendations and keep the context of the SR 1 facility in mind. All staff involved in the design of a damage repair project along SR 1 should review this section in its entirety. Note that the design guidelines in this section do not replace the *Highway Design Manual* (HDM) (Caltrans 2020a), and any deviations from the standards contained in the HDM will require an approved Design Standard Decision Document (DSDD). The design guidelines, however, are intended to provide ancillary information for these DSDDs. The Caltrans Headquarters Division of Design delegated to the District the approval of certain design exceptions for HDM standards. Specifically, exceptions for HDM standards that are in boldface and underlined for these types of highways were delegated on January 30, 2015, and April 15, 2020, respectively.

It is important to understand the project location, natural context, landscape setting, vehicle and bicycle volumes and speeds, community needs, outcomes from past planning efforts, and other key site conditions when designing projects. To support Caltrans' Context Sensitive Solutions policy as part of these design recommendations, the different landscape units in the SR 1 corridor are discussed. Staff should use these recommendations in tandem with Table 5-1, Design Recommendations, presented in Chapter 5.

Chapter 3 Environmental and Permitting Considerations

3.1 Environmental Setting and Context

SR 1 in San Mateo County is mostly a two-lane rural highway that meanders along the Pacific coastline. There are portions of SR 1 in San Mateo County with dividers and/or more than two lanes. These Guidelines primarily apply to its rural, undivided two-lane portions parallel to the Pacific Coast. SR 1 traverses 13 state parks, including Gray Whale Cove State Beach, McNee Ranch State Park, Montara State Beach, Half Moon Bay State Beach, Año Nuevo State Park, Pescadero State Beach and Marsh Natural Preserve. SR 1 connects, and has become a well-known feature of, the scenic coastline and pastoral inland areas that dominate this region. This scenic quality is protected by the California Coastal Act (Coastal Act); San Mateo County, Half Moon Bay, Pacifica, and Daly City’s Local Coastal Programs (LCPs) (San Mateo County 2013a; City of Half Moon Bay 2020; City of Pacifica 2020a; City of Daly City 1984); and State Parks land management policies.

Residents in the area greatly value the unrushed lifestyle of their communities. Along the San Mateo County coastline from Pacifica to Santa Cruz, SR 1 is known as the “Cabrillo Highway” and operates as a conventional highway. SR 1 provides primary access to several communities and to beaches, parks, and other attractions along the coast, making them popular routes for tourists.

For many coastal residents along the route, SR 1 is the only transportation connection to the rest of California and constitutes their economic lifeline and access to emergency services. The stunning natural beauty of the landscape has also made this section of SR 1 a popular destination for outdoor enthusiasts of all types.

The geographic context and proximity to the Pacific Ocean means SR 1 is subject to serious damage from winter storms and earthquakes, and sea level rise increasingly threatens SR 1 with erosion, flooding, and wave run-up.

San Mateo County lies in the Coast Range geomorphic province. The Coast Range comprises northwest-trending folded and faulted mountains and intermountain valleys that roughly parallel the San Andreas fault zone. The San Andreas fault separates Franciscan Assemblage rocks on the eastern side of the fault from the Salinian granitic rocks and associated marine sedimentary units on the western side of the

fault. The majority of the San Mateo County coast lies within marine sedimentary rocks that were translated northward over the last several million years.

The geology of SR 1 through San Mateo County comprises six distinct topographic and geologic assemblages, divided by faults and characterized by different rock units. From south to north, these include the Pigeon Point Assemblage, the Montara Mountain Assemblage, the Point San Pedro Assemblage, the Pacifica Assemblage, the Woodside Assemblage, and the San Bruno Mountain Assemblage.

The Pigeon Point Assemblage extends from the Santa Cruz County line to just north of San Gregorio State Beach and is bound on the east by the San Gregorio fault. Three geologic units comprise the majority of the assemblage through SR 1: the Cretaceous Pigeon Point Formation, the Tertiary Purisima Formation (Tehama member), and overlying younger marine terraces. These units form flat-lying topography until north of Pescadero, where the bluffs rise significantly above the Pacific Ocean. Few instabilities in the roadway prism are associated with native materials through this stretch of roadway. Most failures are generated by poor highway drainage in and around older fill prisms.

North of San Gregorio State Beach, SR 1 rises through rolling hills of relatively more resistant and folded strata of the Purisima Formation, specifically the Tunitas Sandstone, the Lobitos Mudstone, and the San Gregorio Sandstone subunits. At Martin's Beach, SR 1 traverses marine terraces up through Half Moon Bay. The topography near Half Moon Bay is dominated by the Seal Cove fault (likely the northern continuation of the San Gregorio fault), creating long troughs that form the bay and harbor. Roadway failures through this stretch of SR 1 are few and limited to erosion associated with fills and deteriorated culverts.

North of Montara, the granodiorite of Montara Mountain begins to dominate the coast. Steep slopes rise above the Pacific Ocean, and SR 1 hugs tight to the side of unstable terrain. Devil's Slide is the most infamous of the numerous slides between Montara and Pacifica. The Tom Lantos Tunnels, completed in 2013, provide safe passage for the public along the unstable coastline. The Point San Pedro assemblage extends from the northern entrance of the Tom Lantos Tunnels to Pilarcitos Creek in Pacifica. This short stretch of roadway is characterized by steep, erodible slopes, and is typically highly vegetated. It features a mixture of native and non-native plants.

The Pilarcitos fault in Pacifica marks the boundary between the Point San Pedro assemblage and the Pacifica assemblage. Through Pacifica, young alluvial deposits

fill low-lying topography between more resistant Franciscan Complex rocks and the Pacific Ocean. SR 1 through Pacifica becomes an urban four-lane highway and continues as such north to the San Mateo/San Francisco county line. Minor slope erosion is found along many of the slopes in Pacifica and is the dominant failure type in this assemblage. Typical repairs include rock slope protection and cleaning of loose debris.

The San Andreas fault crosses SR 1 north of Pacifica and separates Franciscan Complex rocks from the Tertiary Merced formation. Geotechnical instabilities are limited to failures of engineered fill and drainage-related damage through this short stretch of SR 1 until it merges with Interstate 280.

SR 1 in San Mateo County is near, and often within, the seismically active strike-slip fault complex. This fault system forms the boundary between the North American and Pacific Plates and often comprises one or more distinctive strands, any or all of which can rupture during a seismic event. Movement along these faults, characterized as strike-slip, allow the plates to grind past each other. The entire length of SR 1 in San Mateo County is expected to experience strong ground motion and possible surface rupture at specific locations during a large seismic event on faults of the San Andreas fault system. Protecting against impacts to the geological, biological, visual, cultural, and archeological resources along SR 1 can constrain and often delay its maintenance and repair. Historically, repair and maintenance projects have been challenging and usually take longer than similar projects in inland portions of the State Highway System.

In addition to its unique natural features, SR 1 is distinguished by its political boundaries. Most of SR 1 falls within the California Coastal Zone, where specific policies govern development in an effort to protect the access, qualities, and resources of the California coast. Figure 3-1 shows the Coastal Zone boundary in San Mateo County, which extends three nautical miles offshore.



Source: CCC 2022

Figure 3-1 Coastal Zone Within San Mateo County Guiding Authorities

3.2 Introduction to Coastal Act and Local Coastal Plans

3.2.1 Coastal Zone Management Act

The United States Congress passed the Coastal Zone Management Act of 1972 to preserve, protect, develop, and (where possible) restore or enhance the resources of the nation's Coastal Zones. Additionally, Congress intended to encourage and assist states in exercising effectively their responsibilities in the Coastal Zone through the development and implementation of management programs to achieve wise use of the land and water resources of the Coastal Zone, giving full consideration to ecological, cultural, historic, and aesthetic values, as well as the needs for compatible economic development.

For all of the California Coast, except San Francisco Bay, the CCC is responsible for implementing the Coastal Zone Management Act. The CCC is responsible for reviewing proposed federal and federally authorized activities to assess their consistency with the approved state coastal management program.

The CCC's federal consistency authority applies to activities that are undertaken, funded, or permitted by federal agencies or if they occur on federal lands. Such activities, whether or not they occur inside the Coastal Zone, are subject to the federal consistency Coastal Zone Management Act provisions if they have the potential to affect resources in the Coastal Zone. During such reviews, the CCC determines whether the proposed activities are consistent with the policies of the Coastal Act and may refer to certified LCP policies as guidance for determining such consistency.

3.2.2 California Coastal Act

The resource protection policies and planning processes underpinning the Coastal Act were established by voter initiative in 1972 (Proposition 20) and later adopted by the California Legislature through the Coastal Act of 1976 (Public Resources Code [PRC] sections 30000 30900). The law is administered by the CCC and is the backbone of the state's federally approved coastal management program. The CCC issues coastal development permits; reviews federal activities affecting the Coastal Zone; reviews LCPs, LCP amendments, and appeals of local CDPs; educates the public; and works with local governments and other agencies to protect a number of coastal resources, including public beach access, wetlands, sensitive habitats, agricultural lands, water quality, scenic vistas, and coastal tourism.

The CCC's jurisdiction extends to all areas within the Coastal Zone, which includes approximately 1.5 million acres of coastal land extending from Oregon to Mexico.

See Figure 3-1 above for the Coastal Zone boundary within San Mateo County. The Coastal Zone's western boundary begins 3 miles at sea and extends inland to varying degrees that range from a few blocks up to 5 miles. SR 1 in San Mateo County falls entirely within the Coastal Zone, from PM 0 to PM 48.5 (CCC 2022). Projects in the Coastal Zone that include activities not specifically excluded by the Coastal Act are subject to regulatory review by the CCC or, where the CCC has certified an LCP, by the local government implementing that program.

The entirety of the Coastal Zone in San Mateo County is under the jurisdiction of LCPs, meaning that Coastal Development Permits in San Mateo County will likely be filed with the applicable LCP, rather than the CCC. However, a large portion of Caltrans' projects that are subject to local governmental review for necessary Coastal Development Permits are also appealable to the CCC. This means that the local decision on a Coastal Development Permit filed with an LCP may be appealed to the CCC. Moreover, the Commission retains jurisdiction over any development proposed on tidelands, submerged lands, and public trust lands. Thus, project areas that cross major rivers, streams, estuaries, or are very close to the ocean shoreline may remain in Commission's jurisdiction. Contact Commission staff early in the project process to confirm jurisdiction.

It is important to note that repair and maintenance activities can only be exempt when they do not have potential adverse impacts to coastal resources. This is further defined in the CCC's regulations. Coordination with CCC staff early on can confirm whether or not an activity is potentially exempt. Local governments can also request that these exclusions be included in their LCPs, as certified by the CCC.

So long as there is no risk of causing substantial adverse impacts on public access, "Environmentally Sensitive Habitat Areas" (ESHAs), wetlands, or public views to the ocean, and there is no expansion of the roadway facility, it is possible that no permit is required for repair and maintenance of existing public roads. This includes landscaping; signalization; lighting; signing; resurfacing; replacing retaining walls, safety barriers, and railings; and other comparable development in the existing right-of-way (14 California Code of Regulations 13252(a); CCC 1978). Designers should contact the Environmental Analysis Branch Chief for San Mateo County to determine the applicability of the exclusion and consult with CCC staff.

Maintenance activities are generally those necessary to preserve the highway facility as it was constructed with no major new components or structural development,

including constructing temporary detours; removing slides and slip outs; restoring and repairing drainage appurtenances; installing minor insubstantial slope protection devices; installing minor drainage facilities for preservation of the roadway or adjacent properties; restoring and repairing bridges and other highway structures for public safety; and restoring pavement and base to original condition by replacement, resurfacing, or pavement grooving. A permit is required for excavation or disposal of fill outside of the roadway prism.

The PDT should review Appendix B, which is an exemptions worksheet created by the CCC. This will help the PDT determine if their project may be exempt from a coastal development permit and guide them through the exemption process. Ultimately, the PDT should discuss permitting with the Environmental Analysis Branch Chief for San Mateo County and consult with CCC and LCP staff as applicable.

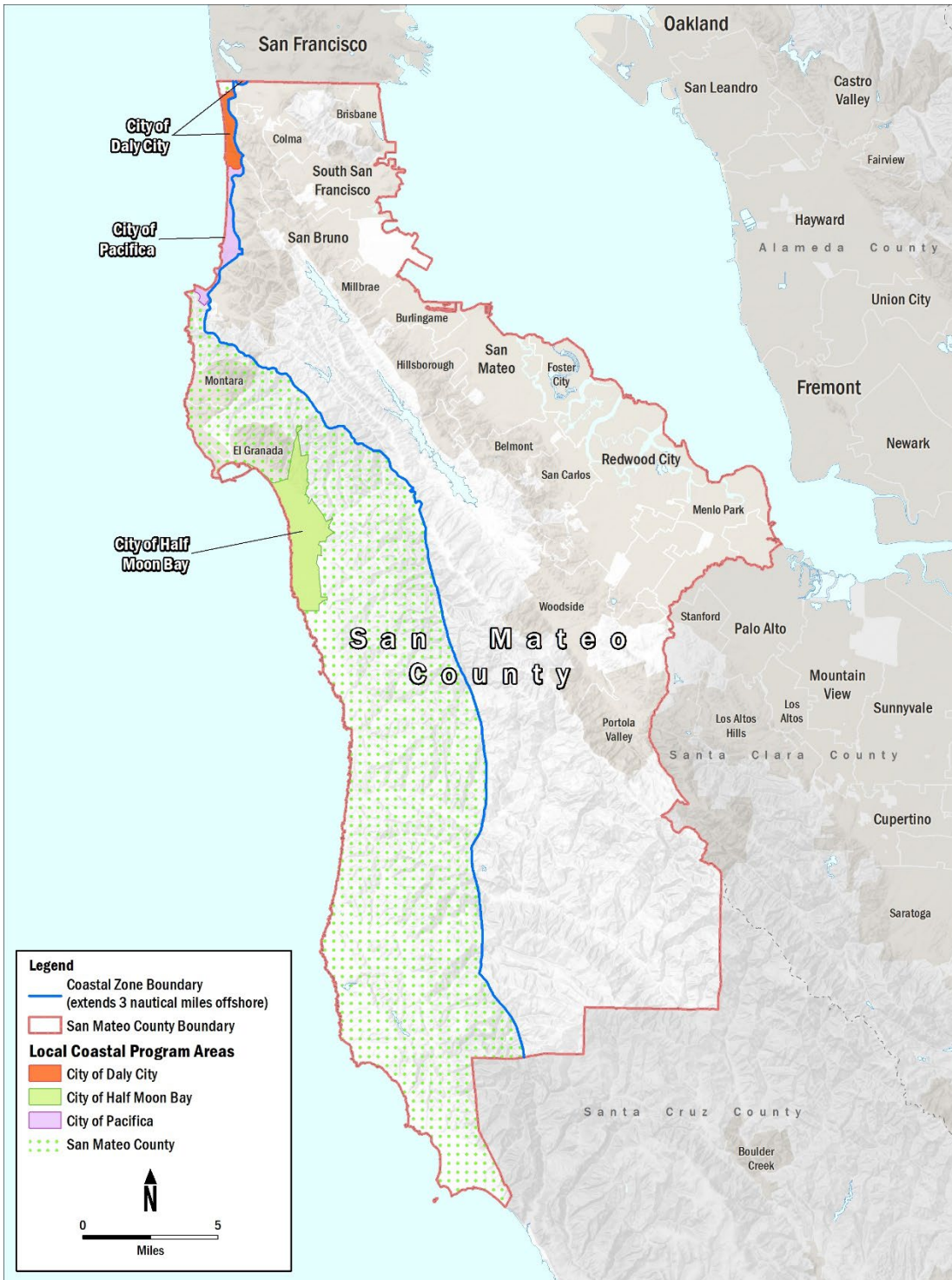
3.2.3 Local Coastal Plans

As stated above, the entirety of the Coastal Zone in San Mateo County is under the jurisdiction of LCPs. LCPs are the local governments' planning guidelines for coastal development; once certified by the CCC, they provide cities and counties with the authority to issue Coastal Development Permits, with a defined appeal authority resting with the CCC. The CCC retains the primary permit jurisdiction for tidelands, submerged lands, and public trust lands. An LCP must be consistent with Coastal Act policies and allows local governments to specify further actions and policies for their own regional setting.

The proposed Guidelines are within the jurisdiction of four LCPs: those of the County of San Mateo and the Cities of Pacifica, Half Moon Bay, and Daly City. The PDT should review Figure 3-2, work with Caltrans environmental staff, and consult with CCC staff to determine the LCP jurisdiction their project falls under.

3.2.3.1 SAN MATEO COUNTY LCP

San Mateo County adopted its LCP in 1980 and assumed responsibility for implementing the Coastal Act in the unincorporated area of San Mateo County, including issuance of Coastal Development Permits, in 1981. The County of San Mateo Local Coastal Program Policies include amendments approved through August 8, 2012 (San Mateo County 2013a). The LCP defines the urban/rural boundary as a stable line separating urban areas and rural service centers from rural areas in the Coastal Zone and establishes this line on the LCP Land Use Plan Map.



Source: CCC 2022

Figure 3-2 Local Coastal Program Areas of San Mateo County

3.2.3.2 HALF MOON BAY LCP

The City of Half Moon Bay's LCP is made up of a local coastal land use plan and a local coastal implementation plan. It was first certified by CCC in 1996 and was recertified in 2021 following a comprehensive update. The planning area for this LCP extends approximately 6 miles along the Pacific Coast and encompasses 4,267 acres, including the entire City of Half Moon Bay and some of unincorporated San Mateo County.

3.2.3.3 PACIFICA LCP

As with the Half Moon Bay LCP, the Pacifica LCP is made up of a local coastal land use plan and a local coastal implementation plan. The Pacifica LCP is currently undergoing review by the CCC, and a draft version is available to the public (City of Pacifica 2020a).

3.2.3.4 DALY CITY LCP

The City of Daly City's Coastal Element/Local Coastal Program was adopted in 1984. It contains coastal policies, to be used throughout the coastal planning process. As stated in this LCP, vehicular, pedestrian, and visual access to the Coastal Zone and specifically to the beach in Daly City is very limited. Vehicular access, particularly, is limited to two points: Westridge and Westmoor Avenues. SR 1 trends inland after the Pacifica/Daly City border and does not parallel the coast as it does in the southern portion of San Mateo County.

3.3 Aesthetics

3.3.1 Scenic Highway Designation

SR 1 is an Officially Designated State Scenic Highway from the Santa Cruz County line north to the city limit of Half Moon Bay. The remainder of SR 1 is currently eligible for state scenic highway status. Additionally, SR 1 is designated a County Scenic Highway from its intersection with I-280 in Daly City to the northern limits of the City of Half Moon Bay by the San Mateo County General Plan (San Mateo County 2013b).

3.3.2 Context Sensitive Solutions

In November 2001, Caltrans adopted Director's Policy 22 (Caltrans 2001), which states that all approaches toward planning, designing, constructing, maintaining, and operating the Caltrans system should look for "Context Sensitive Solutions." This means that transportation decision making should be inclusive, considering and integrating aesthetic, historic, and environmental values into the process of project

delivery. The policy recognizes that highways are more than just the paved roadway—they are corridors that support communities’ economic, aesthetic, cultural, and social needs. The Context Sensitive Solutions policy asks staff to reach resolutions through a collaborative interdisciplinary approach involving all stakeholders. For example, the PDT should coordinate with State Parks staff for projects bordering a state park. The CCC; County of San Mateo; and cities of Half Moon Bay, Pacifica, and Daly City should be included for projects in, or affecting the resources of, the Coastal Zone in which they hold jurisdiction.

3.3.3 Aesthetic Policies

The National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA) California Coastal Act, LCPs, State Parks policies, Caltrans policies, and County and City General Plans regulate actions with the potential to affect visual resources. Early coordination with CCC, State Parks, and local coastal planners will help the PDT identify potential issues and solve them collaboratively. The following are examples of applicable policies:

- **California Coastal Act – PRC Section 30251:** “The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.”
- **California Coastal Act – PRC Section 30254:** “...it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road.”
- **State Parks – *Department Operations Manual, Scenic Values and Viewshed (0312.2) (State Parks 2010)*.** The principal objective in the management of scenic areas is preservation of the quality of the visual environment. More specific objectives in scenic resource management should include the following:
 - Identify and protect scenic resources and qualities.
 - Avoid or minimize modifications to scenic resources.
 - Remove intrusive human-made elements that are not significant cultural resources, including intrusive light and noise.

- Where modifications of scenic resources are necessary, design attractive structures that are subordinate to the character of their surroundings and that appear to belong to their setting, in sympathy with the sense of place.
 - Locate structures in the background as much as possible, isolated from primary views.
 - Use visually harmonious materials, colors, textures, and scale that blend into and are subordinate to their landscapes' background.
 - Unify structures on the site with a consistent style of architecture and materials.
- **San Mateo County General Plan – General Policy 4.22:** Protect and enhance the visual quality of scenic corridors by managing the location and appearance of structural development.
 - **San Mateo County LCP – Policy 8.31, Regulation of Scenic Corridors in Rural Areas**
 - a. Apply the policies of the Scenic Road Element of the County General Plan.
 - b. Apply Section 6325.1 (Primary Scenic Resources Areas Criteria) of the Resource Management (RM) Zoning District as specific regulations protecting scenic corridors in the Coastal Zone.
 - c. Apply the Rural Design Policies of the LCP.
 - d. Apply the Policies for Landforms and Vegetative Forms of the LCP.
 - e. Require a minimum setback of 100 feet from the right-of-way line, and greater where possible; however, permit a 50-foot setback when sufficient screening is provided to shield the structure from public view.
 - f. Continue applying special regulations for the Skyline Boulevard and Cabrillo Highway State Scenic Corridors.
 - g. Enforce specific regulations of the Timber Harvest Ordinance which prohibits the removal of more than 50% of timber volume in scenic corridors.

The list of aesthetic policies above is not exhaustive – there are additional policies, not highlighted above, that may be applicable depending on the project location and scope. The PDT should coordinate with the applicable agencies to consider policies beyond those that are identified above. Additionally, the PDT may review Chapter 27

of the Caltrans Standard Environmental Reference (SER), which provides additional background information and guidance for visual and aesthetic review.

3.4 Biological Resources and other Environmental Considerations

NEPA, CEQA, and various other federal and state laws regulate actions that may affect sensitive species and habitats, water quality, cultural resources, and more. Such resources are also protected by local laws and plans, including LCPs and general plans. Depending on the project scope, the PDT may be required to obtain permits, concurrences, or authorizations from the following entities: California Department of Fish and Wildlife (CDFW), the California Regional Water Quality Control Board, State Parks, the United States Army Corps of Engineers (USACE), the United States Fish and Wildlife Service (USFWS), the State Lands Commission, the Gulf of Farallones National Marine Sanctuary, National Marine Fisheries Service, and others. Each of these agencies examines Caltrans' efforts through a different lens and policy, adding another layer of complexity to the regulatory matrix that applies to any SR 1 repair project. Early coordination with Caltrans environmental staff will help the PDT identify project-specific requirements, including permits.

The Coastal Commission also has multiple policies protecting biological resources. These include protections for areas designated as “Environmentally Sensitive Habitat Areas” (ESHA) under PRC Section 30240, Marine resources under PRC Section 30230 and 30231, and wetlands under PRC Section 30233, among other natural resource protections.

For a comprehensive list and description of these requirements, refer to Caltrans' Standard Environmental Reference (Caltrans 2022a). An overview of those requirements is presented in Appendix A.

3.5 Public Access

Public access is an important consideration for projects on SR 1 in San Mateo County. PRC Section 31000.5(c) states that one of the basic goals of the Coastal Act is to “Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of private property owners.” Multiple other Coastal Act policies such as PRC Section 30210 and 30211 protect existing access and require maximization of access. The four LCPs also assign great importance

to public access. For example, the Half Moon Bay LCP requires any development that could impede public access to obtain a Coastal Development Permit. To that end, the PDT should ensure continued public access through damage repair projects. Damage repair projects should seek to restore the affected transportation facility to its previous condition, and seek opportunities to improve public access if applicable, while ensuring maximum public access to and along the coast.

3.6 Climate Change and Other Hazards

SR 1 in San Mateo County is vulnerable to numerous hazards, including the effects of climate change, sea level rise, earthquakes, floods, landslides, severe weather, tsunamis, wildfires, and dam failures. Understanding the nature of these hazards will help the PDT implement an effective damage repair project and make recommendations for future projects that may be needed. As stated in the San Mateo County Multijurisdictional Local Hazard Mitigation Plan, federal disasters declared in San Mateo County have included the following: severe winter storms, flooding, and mudslides; wildfires (e.g., CZU Lightning Complex); and earthquakes (San Mateo County 2021).

On July 15, 2020, Caltrans completed its Statewide Climate Change Vulnerability Assessment Reports, which are designed to “provide the department with a comprehensive database that will help in evaluating, mitigating, and adapting to the effects of increasing extreme weather events on the state transportation system” (Caltrans 2020b). According to the District 4 Climate Change Vulnerability Assessment Report, Caltrans experienced weather-related damages in 110 locations between January and May of 2017, with a cumulative cost of \$250 million (Caltrans 2018b).

Caltrans expects that storm-related damage and extreme weather will increase in frequency due to climate change. Therefore, Caltrans seeks to incorporate transportation system resiliency improvements into damage repairs, where reasonable and feasible. Climate change adaptation strategies may not be applicable to all storm damage repair projects – particularly those with limited scopes. However, the PDT should look for adaptation opportunities where applicable.

3.6.1 Sea Level Rise

Sea level rise, coupled with cascading effects such as storm surge, represents a long-term threat to coastal areas, including SR 1 in San Mateo County. Multiple Coastal Act policies require analysis and adaptation planning for sea level rise, including PRC Section 30270 and Section 30001.5(f). The PDT should refer to the Caltrans webpage

for Sea Level Rise and the Transportation System in the Coastal Zone,² which provides helpful resources for incorporating sea level rise policy into project development, including the Coastal Commission’s 2018 Sea Level Rise Policy Guidance. The PDT should note that sea level rise projections and planning guidance are subject to change, and should therefore check the Caltrans webpage for the latest guidance. The PDT may also check with CCC staff to confirm if any additional guidance is available.

The California Ocean Protection Council (OPC) provides the most current accepted estimates for sea level rise in California. Projected sea level rise based on the OPC State of California Sea Level Rise Guidance 2018 Update (OPC 2018) at the nearest tide gauge (San Francisco) – assuming a high emissions scenario to the end of the century (i.e., 2100), with a 1-in-200 (0.5 percent) probability – indicates that sea level rise will rise to meet or exceed 6.9 feet above current conditions. Table 3-1 lists additional sea level rise data based on probability. To analyze how this level of rise would impact their project area, the PDT may use the National Oceanic and Atmospheric Administration (NOAA) Sea-Level Rise viewer (<https://coast.noaa.gov/digitalcoast/tools/slr.html>) and Point Blue’s Our Coast Our Future viewer (<https://ourcoastourfuture.org/hazard-map/>).

Multiple sections of SR 1 in San Mateo County are vulnerable to sea level rise and are identified in the Caltrans District 4 Climate Change Vulnerability Assessment Report as areas at risk of coastal erosion. Erosion and landslides are anticipated to worsen with sea level rise, coastal storms, and precipitation effects. When initiating a long-term damage repair solution, the PDT should strategize with Caltrans environmental staff, the CCC, and local coastal planners, as applicable, to seek sea level rise resiliency improvement opportunities.

² <https://dot.ca.gov/programs/environmental-analysis/coastal-program/coastal-act-policy-resource-information/coastal-hazards/sea-level-rise>

Table 3-1 OPC Probabalistic Sea Level Rise Projections (in Feet)

Emissions Scenario	Median (50% probability sea-level rise meets or exceeds...)	Likely Range (66% probability sea-level rise is between...)	1-In-20 Chance (5% probability sea-level rise meets or exceeds...)	1-In-200 Chance (0.5% probability sea-level rise meets or exceeds...)	H++ Scenario (Single Scenario)
High Emissions 2030	0.4	0.3 - 0.5 ¹	0.6	0.8 ²	1.0 ³
High Emissions 2040	0.6	0.5 - 0.8 ¹	1.0	1.3 ²	1.8 ³
High Emissions 2050	0.9	0.6 - 1.1 ¹	1.4	1.9 ²	2.7 ³
Low Emissions 2060	1.0	0.6 - 1.3 ¹	1.6	2.4 ²	3.9 ³
High Emissions 2060	1.1	0.8 - 1.5 ¹	1.8	2.6 ²	3.9 ³
Low Emissions 2070	1.1	0.8 - 1.5 ¹	1.9	3.1 ²	5.2 ³
High Emissions 2070	1.4	1.0 - 1.9 ¹	2.4	3.5 ²	5.2 ³
Low Emissions 2080	1.3	0.9 - 1.8 ¹	2.3	3.9 ²	6.6 ³
High Emissions 2080	1.7	1.2 - 2.4 ¹	3.0	4.5 ²	6.6 ³
Low Emissions 2090	1.4	1.0 - 2.1 ¹	2.8	4.7 ²	8.3 ³
High Emissions 2090	2.1	1.4 - 2.9 ¹	3.6	5.6 ²	8.3 ³
Low Emissions 2100	1.6	1.0 - 2.4 ¹	3.2	5.7 ²	10.2 ³
High Emissions 2100	2.5	1.6 - 3.4 ¹	4.4	6.9 ²	10.2 ³

Source: OPC 2018

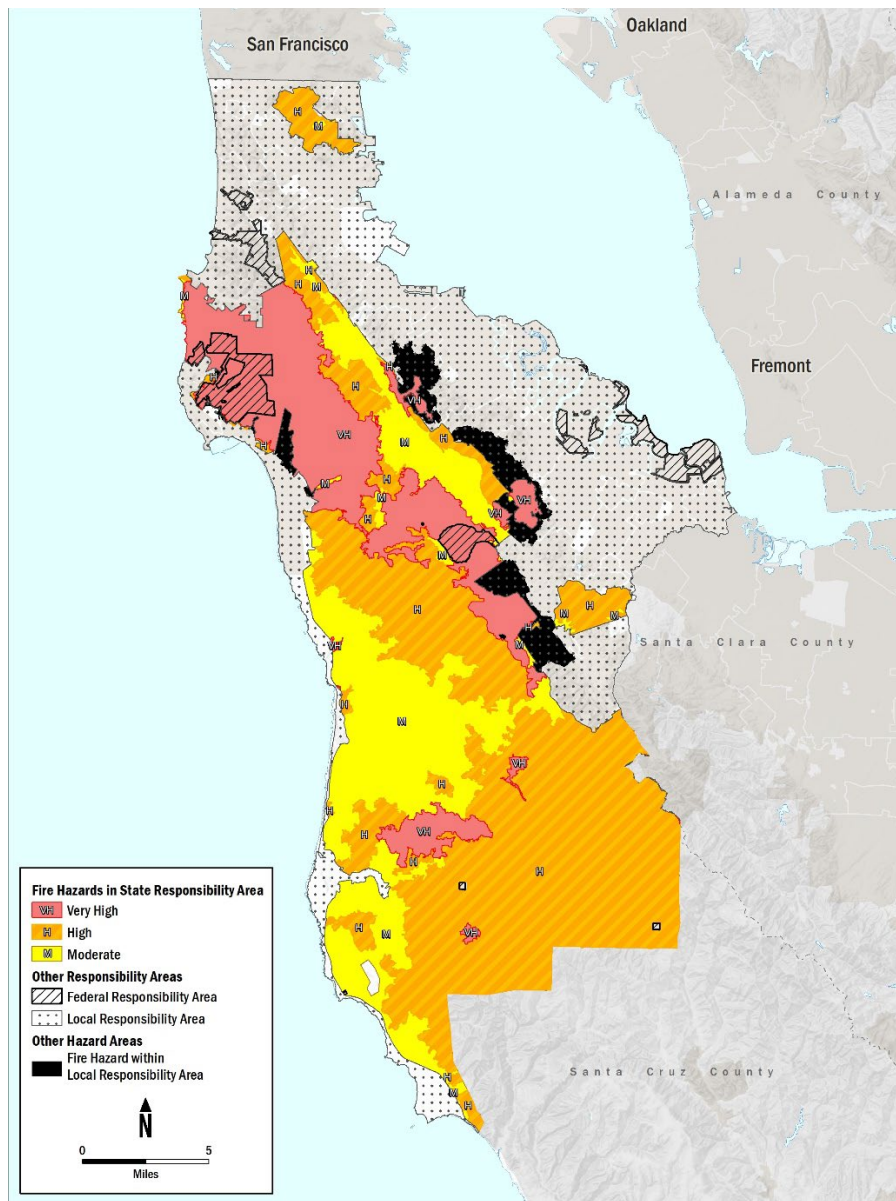
Table notes:

- 1. Low Risk Aversion
- 2. Medium – High Risk Aversion
- 3. Extreme Risk Aversion

OPC = Ocean Protection Council

3.6.5 Wildfire

Wildfires represent a serious threat to the transportation system across District 4, including SR 1 in San Mateo County. The 2020 CZU Lightning Complex Fires affected a large swath of San Mateo County, including its coastline. Wildfire is a direct threat to the traveling public and can exacerbate flooding risks. It can also severely damage the transportation system, as has been observed in recent incidents. Figure 3-3 shows fire hazard severity zones in the State Responsibility Areas of San Mateo County.



Source: CAL Fire 2007

Figure 3-3 Fire Hazard Severity Zones in the State Responsibility Area of San Mateo County

As shown in Figure 3-4, there are multiple areas in San Mateo County that are designated as very high fire hazard severity zones. The frequency and severity of wildfires are anticipated to increase with future higher temperatures and changing precipitation patterns (Caltrans 2018b). The PDT should seek opportunities to incorporate fire resiliency into long-term damage repair projects.

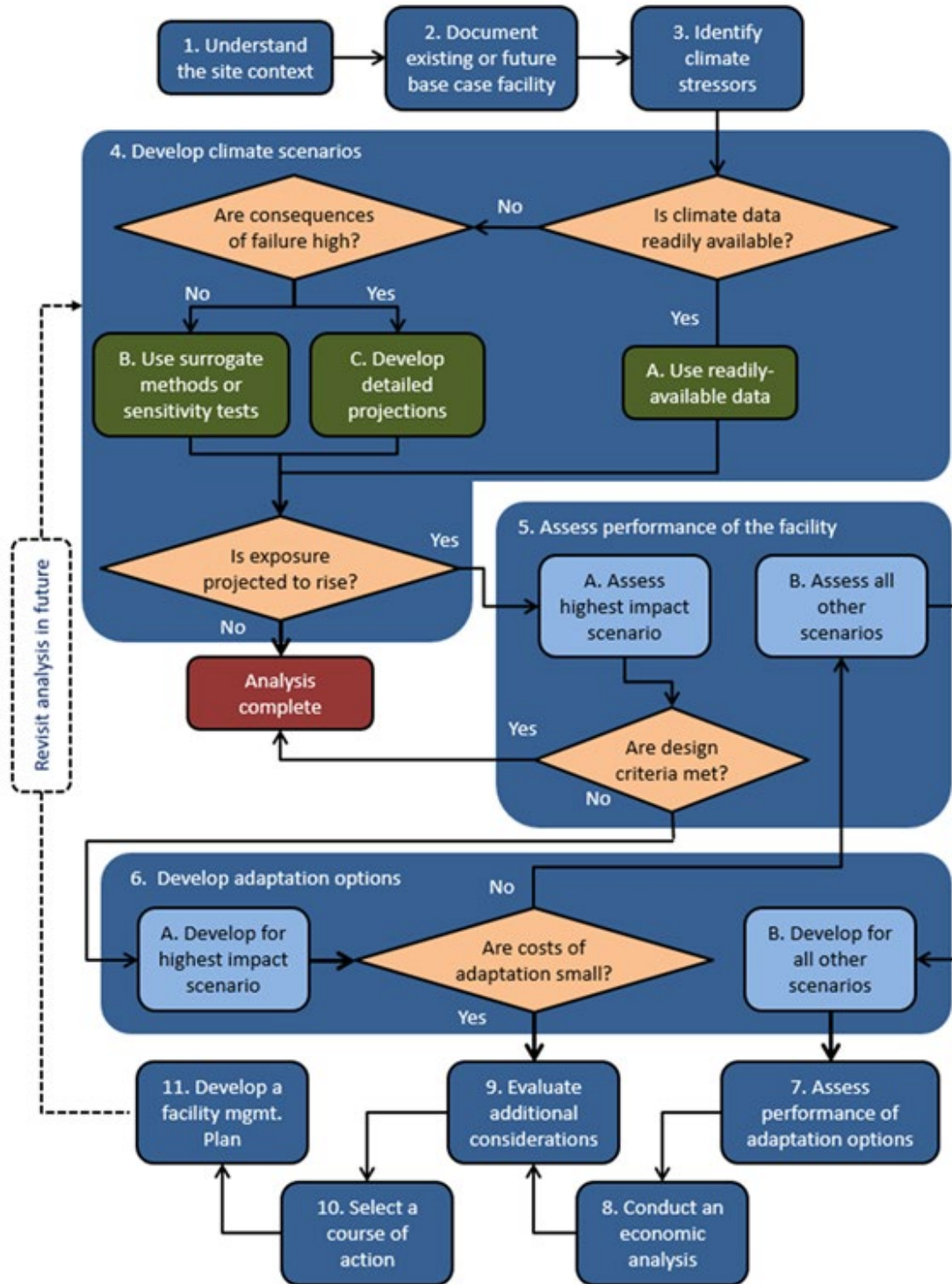
3.6.3 Adaptation Strategies

Depending on the project scope, addressing damage by rebuilding to previous conditions may not be the most appropriate strategy, and could leave the transportation system vulnerable to the systemic effects of climate change.

The Federal Highway Administration has developed an approach to making design decisions that incorporates climate change: the Adaptation Decision-Making Assessment Process (ADAP). Figure 3-4 visualizes ADAP as a flowchart – the PDT should review this flowchart to help determine if there are resiliency opportunities for their project.

The Tom Lantos Tunnels in northern San Mateo County are an example of Caltrans District 4’s adaptation strategies at work. This long-term project was built to bypass the Devil’s Slide area, which had previously been severely affected by closures due to rockslides and land slippage. Not only did this project increase resiliency, but it also presented an opportunity for multimodal improvements, as Caltrans turned over the old section of SR 1 to San Mateo County to be used as a pedestrian and bicycle facility. While the damage repair projects that these Guidelines apply to are likely to be smaller in scope than the Tom Lantos Tunnels, the PDT should look at long-term repair projects as an opportunity to improve resiliency and seek collaboration with stakeholders.

Surfer’s Beach is another area that exhibits climate change vulnerability. San Mateo County has studied this area and has implemented adaptation strategies in the past (i.e., the Surfer’s Beach Access and Erosion Control Project). San Mateo County identifies this area as being highly vulnerable to sea level rise, and conditions placed on prior Coastal Development Permits may affect future repair projects and adaptation strategies (San Mateo County 2018). Therefore, it is important for the PDT to coordinate with stakeholders such as San Mateo County, as applicable, to identify potential adaptation strategies for repair projects.



Source: FHWA 2016

Figure 3-4 Adaptation Decision-Making Assessment Process Flowchart

Chapter 4 Process

4.1 Process for Major Damage Repairs

Caltrans District 4 Maintenance is responsible for providing documentation to secure funding for major damage repairs. This documentation requires input from a wide range of functional units, including the following:

- Geotechnical Design
- Design (Roadway)
- Landscape Architecture
- Environmental
- Structures
- Materials
- Hydraulics
- Right-of-Way
- Operations: Traffic Safety, Corridor and Systems Management
- Construction

A Caltrans Director's Order is necessary to perform emergency damage repairs. A Director's Order is a formal document, signed by the Director or delegated Deputy Director, that grants authority to a district to accelerate project award and set aside the standard project advertising, bidding, and award processes. Director's Orders are critical to Caltrans' ability to respond effectively and quickly to emergencies on the state highway system.

The typical approach for most major damage sites is a standard two-step process consisting of two projects. The first project is an emergency opening project, such as debris removal, asphalt concrete pavement leveling, or setting up traffic control to restore essential transportation functions. The second project is a permanent restoration project for the full repairs.

Emergency opening projects are repairs made during and immediately following major damage and are intended to restore essential traffic, minimize the extent of damage, and protect the remaining facilities. Permanent restorations are repairs performed after emergency repairs have been completed and are intended to restore the highway to its pre-disaster operating condition. These Guidelines apply to both emergency openings and permanent restoration repair projects, in different capacities.

Although the Guidelines primarily apply to permanent restoration repair projects, there are instances when emergency openings and permanent restoration projects are performed concurrently. If this is the case, the Guidelines would also apply to the project. Emergency opening-only efforts are directed by the Division of Maintenance and should be performed using these Guidelines as a reference for best practices.

4.1.1 Project Development for Roadway Damage Repair Projects

Most permanent restoration projects and rehabilitation projects use the design-bid-build process, following the guidelines in the *Project Development Procedures Manual* (Caltrans undated) for a bid with plans, specifications, and an engineer's estimate. A Damage Assessment Form can serve as the project initiation and project approval document for some straightforward projects. For more complex projects, a Project Initiation Report and a Project Report are required (a Damage Assessment Form is an attachment to these documents). The District Maintenance Engineer will coordinate with Design and Headquarters programming to make this determination.

All projects must comply with state and federal regulations intended to protect the public and environment from damage or impacts. Response to events that have been declared a disaster by the state or federal government, or in which a state of emergency has been declared, may have some or all of these regulations suspended for a short period of time. It is during this time that emergency opening projects typically are executed. However, coordination with CCC, LCPs, and State Parks should be maintained during declared emergencies, in order to avoid impacts to protected resources within their respective jurisdictions.

The following is an overview of the permanent restoration project development process:

1. Perform a field assessment.
2. Conduct a preliminary consultation with the staff of agencies that have permitting authority over the project. As part of this consultation, participants will determine what additional review may be desirable before and during Caltrans' 30, 60, and 90 percent design review processes.
3. Ensure that design is based on the HDM, the parameters of this document, and other constraints identified by field assessments, including the following:

- a. Form a PDT; the project will be refined based on functional group guidance. Base any design exceptions on site context and impacts, and document all deviations in a DSDD. Fulfilling the policy objectives listed in Chapter 3, and their underlying mandates, should be a high priority in guiding the design process.
 - b. Maintaining or improving upon current roadway geometry (where feasible, while providing for safe multimodal travel) rather than achieving a greater design speed should guide design. See Section 5.2.1 Design Speeds.
 - c. Consider how the various design parameters of Chapter 5 can be synthesized to best fulfill policy objectives and inform the overall design.³
4. Ensure environmental compliance, including developing and preparing the NEPA and CEQA documents as needed and incorporating alternative design analysis and other information needed for any required coastal development permits, Section 4(f) coordination, or other agency approvals. This task requires continued coordination with relevant permitting agencies and other relevant resource agencies. This includes the San Mateo County Parks Department and State Parks for potential coastal trail improvements. Additional or revised design exceptions may need to be prepared as part of this planning process. Depending on the level of environmental document, it may require public involvement activities.
 5. Secure environmental permits,⁴ which may involve appearing before an approval authority and participating in a public involvement process.
 6. Finalize project design, satisfy permit conditions, and obtain right-of-way clearances.

³ For example, relative to roadway geometrics and lane/shoulder widths, 12-foot lanes might provide safe truck turning, but one or both shoulders could be narrower where appropriate to minimize overall roadway/structure width, or vice versa (designing a narrower travel lane and increasing the width of the shoulder[s]).

⁴ A coastal development permit may be required, as discussed in Chapter 3. The CDP would either be sought from the CCC, San Mateo County, Half Moon Bay, Pacifica, or Daly City, depending on the affected jurisdiction. Depending on the scope and location of the damage and the necessary repair response, Caltrans may also be required to obtain permits, concurrences, or authorizations from the following: CDFW, the California Regional Water Quality Control Board, State Parks, USACE, USFWS, State Lands Commission, National Marine Fisheries Service, and others. Each of these agencies examines Caltrans' efforts through a different lens of policy requirements, adding another layer of complexity to the regulatory matrix that applies to any SR 1 repair project.

7. Send project construction plans out to bid.
8. Administer the construction contract consistent with the issued permit; any proposed changes must be reviewed by appropriate functional units for consistency with standards, these Guidelines, and permits. Proposed changes that are inconsistent with issued regulatory waivers or permits must receive appropriate regulatory clearances prior to being implemented.
9. Perform post-construction activities, such as revegetation monitoring and reporting and implementing mitigation commitments until required performance standards are met. It is noted that programmatic and advanced mitigation planning is being developed and should be considered as a potential fit for project needs.

For additional information on Major Damage or Director's Order Projects, refer to the Division of Maintenance Website (Caltrans 2022b).

4.1.2 Federal Funding

Emergency opening and permanent restoration projects are eligible for federal funding reimbursement when there is a declared disaster. Projects are eligible for reimbursement for two federal fiscal years after the triggering event. The funding source is first-come/first-served. Projects developed quickly are more likely to receive federal transportation dollars. Projects that are not able to meet the time constraints of the federal program are likely to be funded from the State Highway Operations and Protection Program (SHOPP) account under the Major Damage Restoration category. The greater percentage of federal dollars captured to fund the Major Damage Restoration category frees up the SHOPP state-only funding for other programming categories, such as the Stormwater Mitigation Program or the Roadside Protection and Restoration Program.

4.2 Incident Response Coordination

The Caltrans emergency response chain of command is already in place and exists independent of the project development process. The purpose of this section is to provide transparency to partner agencies regarding Caltrans' emergency response protocols. The information in this section is adapted from the Caltrans District 4 Emergency Operations and Response Plan (Caltrans 2018c) and is intended for use in emergency opening projects. Examples of emergencies include earthquakes, storms, tsunamis, flooding, hazardous material spillage, and wildfires.

Emergency procedures are intended to be flexible enough to ensure that all situations are properly handled. Most incidents are handled at the field response level without the need to activate Caltrans District 4's Emergency Operations Center (EOC). However, when an extraordinary disaster occurs, the EOC may be activated to coordinate resources and information needed to support the directly impacted areas.

Whether it is a field-level incident or a larger emergency, Caltrans' emergency response priorities may generally be summarized as follows:

1. **Traffic Control:** In coordination with the California Highway Patrol (CHP), Caltrans establishes road closures and detour routes, where the State highway is impassable, or when the public safety is a risk. Depending upon the circumstances, the road may be reopened to: a) emergency vehicles; b) local traffic; c) commercial traffic; d) high occupancy vehicles; or e) all traffic.
2. **Damage Assessment:** Caltrans conducts public safety/damage surveys; collects and analyzes information on the nature/severity of damages; reports via established channels; and determines appropriate response.
3. **Route Recovery:** Caltrans undertakes necessary work for reopening of damaged facilities, prevention of additional damage, and eliminating travel restrictions using in-house resources of emergency contracts.

If activated, the EOC provides a focal point for all emergency activities within District 4, and helps disseminate information to Caltrans Management, local emergency providers, and the public. The EOC follows the Incident Command System (ICS) and Standardized Emergency Management System (SEMS)/National Incident Management System (NIMS) upon activation.

The EOC Director coordinates activities with the Governor's Office of Emergency Services (Cal OES), State Operations Center (SOC) or Region Emergency Operations Center (REOC).

Caltrans primary emergency response policies include:

- Minimize the loss of life and property
- Protect State-operated facilities and the State highway system

- Maintain & provide-up-to-date damage and operations information to public, media, Local jurisdictions, the Governor, State legislators, as necessary
- Open damaged State transportation system components as soon as possible
- Cooperate with other key agencies at the local, state, and federal levels
- Support the State emergency response efforts by the State Office of Emergency Services (OES), CHP, and local jurisdictions
- Conduct periodic drills and exercises in cooperation with other public agencies

4.3 Stakeholder Coordination

For emergency opening projects, either the applicable Caltrans District 4 field office, regional staff, or the EOC will conduct interagency coordination (e.g., CHP, first responders, State Parks 24-hour dispatch), as needed.

For permanent restoration projects, the PDT should engage in early coordination with CCC, San Mateo County, Pacifica, Daly City, State Parks staff, and other agencies, as applicable. The PDT should consult with Caltrans environmental staff to identify project stakeholders. Early stakeholder coordination has many benefits, including the following:

- Guiding and streamlining the permitting and approval process.
- Highlighting appropriate communications channels for public notification and disseminating information through local jurisdictions.
- Fostering a collaborative environment for project design.
- Creating an opportunity to review potential climate change resiliency improvements.
- Allowing Stakeholders to highlight other needs and potential improvements, such as pedestrian and bicycle facilities (e.g., California Coastal Trail).

4.4 Public Notification Procedures

Public notification is not only a regulatory requirement (NEPA, CEQA, etc.), but an essential step to inform and protect the traveling public. For emergency opening projects, public notification will be coordinated by the applicable Caltrans District 4 field office, regional staff, or EOC and public information officers (PIOs). The PIO's responsibilities include coordinating "as necessary to ensure that the public within the affected area receives complete, accurate, confirmed, and consistent information about lifesaving procedures, health preservation instructions, emergency status and other related information."

For permanent restoration projects, public notification should be coordinated directly with Caltrans environmental and PIO staff. Public notification is an essential component of the Caltrans environmental review process and should be initiated as early as possible. The PDT, in coordination with Caltrans environmental and PIO staff, should ensure that information is disseminated to stakeholders, local jurisdiction PIO staff, community councils, community-based organizations, and other public notification channels, as appropriate. Stakeholders can help the PDT identify appropriate communications channels for the project, and may have access to resources such as local NextDoor and Facebook groups to disseminate information.

4.5 Coastal Development Permitting Process

Whether or not a project is initiated under a Director's Order, is separate from a question whether it may be legally authorized under the Coastal Act as emergency work or may require full coastal development permit processing. Consultation with the permitting agency (the CCC or applicable LCP) should be initiated well prior to filing a Coastal Development Permit application (or exemption, waiver, emergency exemption, etc.), in order to discuss potential issue areas in a collaborative environment. This could take place during the initial environmental review period, or earlier. This will also allow the PDT to discuss potential climate change resiliency and other design (e.g., bicycle and pedestrian) opportunities with the CCC and/or LCP, as discussed in Section 3.6, as well as if HDM design exemptions may be warranted and considered.

The first step is to determine the permitting agency for the project. Any permanent restoration project on SR 1 in San Mateo County will likely be under the jurisdiction of an LCP. Therefore, the PDT will likely need to file their Coastal Development Permit application with San Mateo County, Half Moon Bay, Pacifica, or Daly City,

rather than the CCC. However, there are cases where the CCC would retain authority to issue an exemption, waiver, or permit. In many other cases, the Commission has an appeal authority over the LCP project, and Commission staff should be consulted to avoid such appeals. The PDT should refer to Figure 3-2 – Local Coastal Program Areas of San Mateo County and consult with Caltrans environmental staff to determine the permitting agency and conditions for their project. CCC staff may also be contacted for jurisdictional assistance.

Special conditions may apply if the project is in response to an emergency – see Emergency Authorizations below for more information.

4.5.1 Coastal Development Permit Exemptions

Depending on the location and scope of the project, it may be exempt from a Coastal Development Permit. Generally, for projects within CCC’s jurisdiction, repair or maintenance activities that do not result in an addition to, or enlargement or expansion of, the facility are often exempt from the CCC’s coastal development permit requirements, provided that the activities do not involve a risk of substantial adverse environmental impact (PRC Section 30610(d), as defined in the Commission’s regulations (CCR Title 14, Section 13252). The PDT should review Appendix B, which is an exemptions worksheet created by the CCC. Ultimately, the PDT should discuss the potential for an exemption with Caltrans environmental staff and the permitting agency, as exemption qualification and requirements may vary by jurisdiction.

If the PDT, Caltrans environmental staff, and the permitting agency agree that the project qualifies for an exemption, the PDT may proceed to complete the necessary documentation. The PDT should coordinate with the permitting agency to ensure that they obtain the correct form(s) for documentation of an exemption, and to fulfill all requirements. For example, if the CCC is the permitting agency, the PDT can simply submit a copy of the exemptions worksheet in Appendix B with any project description materials available. However, if San Mateo County is the permitting agency, the PDT will instead need to complete a “Certificate of Exemption or Exclusion from a Coastal Development Permit.”⁵ Forms and requirements may

⁵ San Mateo County Certificate of Exemption or Exclusion from a Coastal Development Permit:

<https://www.smcgov.org/media/73306/download?inline=>

change over time, so the PDT is encouraged to coordinate closely with the permitting agency.

4.5.2 Coastal Development Permit Waivers

Projects that do not meet the criteria for exemptions may still qualify for quicker permit processing. Waivers are another way to expedite the Coastal Development Permit process. Waivers greatly streamline the permitting process and require much less information than a full CDP. They defer from exemptions in that a Coastal Development Permit application must still be submitted, noting specifically that the applicants are requesting a waiver. The PDT may apply to Commission staff for a waiver of permit requirements for projects that have no potential for adverse effects, either individually or cumulatively, on coastal resources, and therefore can be found consistent with the policies of the Coastal Act without the need to apply special conditions under a consent or regular coastal development permit. Note that in some cases, project with potential impacts can adopt protective measures into the project description, such as BMPs, that avoid coastal resource impacts and therefore make a project eligible for a CDP waiver. The waiver takes effect only after being reported to the CCC at the next regularly scheduled CCC meeting, provided there are no objections to the issuance of a waiver.

4.5.3 Emergency Authorizations

Emergency opening projects are generally not required to obtain a Coastal Development Permit, as long as they are simply restoring the roadway to its prior condition with no substantial grading, filling, or structural additions. There are a number of provisions exempting emergency work under the Coastal Act, briefly described here but summarized in more detail in a checklist form in **Appendix C** “Emergency Exemptions, Waivers, and Coastal Development Permits (CDPs).” In all cases of emergency exemptions, notice should be provided to Coastal staff of the exempt maintenance. Additionally, note that even if not exempt, the Coastal Act allows for Emergency CDPs that can be effective immediately with verbal authorization.

The Coastal Act allows for emergency waivers when necessary for immediate actions and costing less than \$25,000. PRC 30611 states the following:

“When immediate action by a person or public agency performing a public service is required to protect life and public property from imminent danger, or to restore, repair, or maintain public works, utilities, or services destroyed, damaged, or

interrupted by natural disaster, serious accident, or in other cases of emergency, the requirements of obtaining any permit under this division may be waived upon notification of the executive director of the commission of the type and location of the work within three days of the disaster or discovery of the danger, whichever occurs first. Nothing in this section authorizes permanent erection of structures valued at more than twenty-five thousand dollars (\$25,000).” In these cases, notice to Commission staff is required within 3 days of the disaster.

Damage to SR 1 in San Mateo County can vary in scale and severity. For severe emergencies, a more expedited emergency authorization may be needed. The Coastal Act Section 30600(e) provides two exemptions for work to protect life or property or to repair public services facilities, generally known as the “Firestone Exemptions”. In both of these cases, notice to Commission staff is required within 14 days of commencement of the repair project.

Section 30600(e)(1) applies if the emergency repairs are located in a disaster-stricken area in which the Governor has declared a state of emergency and immediate emergency work is necessary to protect life or property as a result of the disaster, or immediate emergency repairs to public service facilities are necessary to maintain service as a result of the disaster. In these cases, if the project does not include new structural elements, major additions to the roadway, or significant impacts to Coastal Resources, then the development is exempt from Coastal Act permitting requirements.

Section 30600(e)(2) applies to road or highways damaged as a result of “fire, flood, storm, earthquake, land subsidence, gradual earth movement, or landslide.” In these cases, the project must be carried out within 1 year of when the damage occurred, and this exemption cannot apply if the project is on an official state scenic highway or would expand or widen a road. SR 1 in San Mateo County is an official state scenic highway from the Santa Cruz County line north to the city limit of Half Moon Bay, which means that this exemption cannot apply in that segment.

Finally, in cases not covered by emergency exemptions, the Commission has regular procedures for Emergency CDPs. In these cases, projects that are necessary to address a sudden, unexpected event, and are necessary to prevent or mitigate loss or damage to life, health, property, or essential public services, along with certain other criteria, can be processed as emergency permits. In these cases, Commission staff can give verbal or written authorization to proceed with the work, and the ECDP is reported to

the Commission at the next Commission hearing. Note that in cases of an ECDP, a full follow-up CDP application is required, typically in 60 days' time, and ECDPs may have Special Conditions guiding repair work to protect coastal resources.

Additionally, if the development is located in an area subject to a certified LCP, the local government is usually responsible for reviewing emergency exemptions/waivers/ECDPs. Note that some LCPs do not include a provision for the review of emergency waivers or ECDPs. If that is the case, the CCC retains authority to review and issue emergency authorization for emergency repairs.

As stated in Volume 5, Chapter 5 of the SER, the best practices for emergency work include earliest possible coordination with the local government and/or CCC office to verify what type of emergency authorization (emergency exemption, emergency waiver, or emergency coastal development permit) is required, provided time allows.

4.5.4 Completing a Coastal Development Permit

The filing of a Coastal Development Permit should take place as early as possible, in order to provide adequate time for the permitting agency to review all relevant information and, if needed, provide feedback. Permitting agency staff may need to request additional technical information to support consistency findings, for example.

As stated above, the first step is for the PDT to determine the permitting agency for their project. LCPs may require additional documentation. For example, San Mateo County requires Coastal Development Permit applicants to also file a general Planning Permit Application Form.

The following instructions are based on the CCC Coastal Development Permit application process. Specific requirements may vary if the permitting agency is an LCP rather than the CCC. If filing with an LCP, consult with LCP staff to obtain the latest copy of the permit application, and to ensure that all requirements are fulfilled. If the CCC is the filing agency, the PDT should thoroughly review and complete the CCC's Coastal Development Permit Application, which is available online.⁶ Refer to the application checklist, which details the requirements for filing a Coastal Development Permit with the CCC. The PDT should note that the application is not the sole requirement – additional technical materials and supporting information will

⁶ CCC Coastal Development Permit Application:

https://documents.coastal.ca.gov/assets/cdp/CDP_Application_Form_ncc.pdf

be required, as well as a filing fee. The following are general steps and best practices for applying for a CCC Coastal Development Permit, adapted from the Caltrans on-demand training module on this subject:

- 1) Review the application checklist and prepare all supporting documentation.
- 2) Thoroughly complete the application form – document the whole of the action, carefully consider each question, complete all appendices, include all required attachments.
 - a. Section II calls for the applicant to describe the proposed development in detail. The PDT should not feel limited to the space provided in the application – describe construction phasing, staging, schedule considerations, and public access features, and attach additional sheets as needed.
 - i. Attach and reference technical studies, alternatives analysis, and a preliminary coastal policy consistency analysis as applicable.
 - ii. Attach visual simulations of the project if available, particularly if the project is in a visually sensitive area.
 - iii. Attach all project plans and geotechnical reports, and any special engineering studies
 - b. Document any temporary or permanent loss of parking or bike or pedestrian access. Keep in mind that parking is an important resource (i.e., public access). If applicable, plan for temporary alternative parking solutions during construction.
 - c. Carefully consider any potential effects on coastal resources such as environmentally sensitive habitat areas, wetlands, and agricultural resources. Coordinate with Caltrans environmental staff and review project environmental documentation.
- 3) Ensure that all required attachments listed in the application checklist and Section IV are included.

- 4) Organize and transmit the submittal package in a clear and concise manner, including a cover letter which documents all included materials in the package.
- 5) Post a Notice of Pending Permit at the project site on yellow cardstock.

A PDT may contact Commission staff and discuss application needs and requirements specific to the project at hand prior to submittal, which can speed up the permitting process. Once the PDT's formal Coastal Development Permit application is received by the CCC and assigned to an analyst, it will undergo a 30-day "completeness" review. The PDT should anticipate requests for additional documentation – this is common with Coastal Development Permit applications. Once requested information is received, the application will be subject to a new 30-day review. When the CCC has made a completeness determination, the PDT should anticipate being in front of the CCC within 180 days, with a possible 90-day extension.

4.6 Other Permits

As stated in Section 3.4, the PDT may be required to obtain permits, concurrences, or authorizations from the following entities: CDFW, the California Regional Water Quality Control Board, State Parks, the USACE, the United States Fish and Wildlife Service (USFWS), the State Lands Commission, the Gulf of Farallones National Marine Sanctuary, National Marine Fisheries Service, and others. The PDT should consult with Caltrans environmental staff to determine which additional permits and concurrences may be required, and to prepare the requisite documentation.

Chapter 5 Design Guidelines

The design guidelines herein apply to emergency openings and permanent restoration projects on SR 1 in San Mateo County. As stated in Section 3.1, these Guidelines primarily apply to the mostly rural, undivided two-lane portions of SR 1 parallel to the Pacific Coast. The intent is to improve consistency in design and aesthetic considerations for these projects. Projects should minimize change from current conditions unless making improvements that benefit coastal resources, stay within the existing right-of-way, and be visually compatible with the surrounding environment to protect the established character of SR 1 while maintaining safety and functionality of all design elements. Projects should also protect or make improvements that meet the needs of all roadway users in a multimodal context. Chapter 80 of the HDM calls for a balanced solution to transportation problems. Along with various Coastal Act and LCP policy requirements, the HDM Topic 109, Scenic Values in Planning and Design (see Appendix C), states that the location of the highway, its alignment and profile, the roadway cross section, and other features should all be in harmony with the setting. These guidelines provide additional factors to be considered in achieving that goal. In particular, they provide greater specificity to assist in achieving successful context sensitive designs through appropriate HDM exceptions. All staff involved in the design of a damage repair project on San Mateo SR 1 should review this chapter.

Early and frequent consultation with CCC; San Mateo County; and/or the cities of Half Moon Bay, Pacifica, and Daly City is encouraged for projects requiring coastal development permits, as is early notification to other applicable permitting agencies. Projects in, adjacent to, or visible from State Parks lands, especially public viewing areas, should include early coordination with State Parks to obtain their input and recommendations. This consultation should include all design elements. The PDT should meet early with the Environmental generalist for coordination with partners.

5.1 Overview of Recommendations

In accordance with Design Information Bulletin (DIB) 79-04 (see Section 3.1.8.1), major repair projects can restore the highway to the condition that existed prior to the damage; however, consideration of appropriate highway improvements is part of the project development process. Repair projects that necessitate physical changes to the roadside environment involving a structure—such as retaining walls, bridges, or viaducts—shall, in accordance with the HDM, strive to maintain the existing

character of roadway and minimize changes to the roadway geometric features to achieve appropriate, context sensitive design solutions consistent with resource preservation. These design features include but are not limited to lane and shoulder widths, horizontal and vertical alignments, superelevation, and stopping sight distance. The exact features that constitute final design should be based on a sound engineering analysis that considers the context of the specific project location and the avoidance of adverse impacts. Projects that are considered replacement facilities are expected to bring the roadway geometric features to minimum design standards. However, as indicated in HDM Topics 81 and 109, designers are required to consider potential impacts on sensitive resources and scenic values.

Careful attention should also be given to designing projects along SR 1 to be consistent with Coastal Act policies and all applicable San Mateo County, City of Half Moon Bay, City of Pacifica, and City of Daly City LCPs. Projects with the potential to result in adverse impacts to coastal resources should be reevaluated to consider nonstandard design options to avoid or reduce such impacts. Note that there is value in staying within the existing right-of-way and road bench width, retaining an existing curvature that has a more natural fit to the landscape, and in limiting driving speeds because these are important to the user's experience and part of the character of the roadway. Similarly, projects in or adjacent to State Parks lands, or that may affect the scenic qualities of State Parks lands, should be consistent with park plans and management policies.

Even when working with compressed project timelines, early coordination with CCC, San Mateo County, LCPs, and State Parks is encouraged. This coordination can help the PDT understand key context, guide HDM design flexibility, and how best to apply these Guidelines.

To achieve these objectives, designers may have to perpetuate existing nonstandard features or even propose new nonstandard design features. For example, it may not be possible to accommodate certain standards for larger trucks on the highway in certain segments. Approximately 10 miles of SR 1 in San Mateo County is designated a 65-foot California Legal Route with 40-foot kingpin-to-rear-axle restrictions. Repair projects are not intended to increase this kingpin-to-rear-axle number. Maintaining the current roadway curvature and features should accommodate the design vehicle even for San Mateo County, though roadway geometric features such as curve radii, superelevations, or widths may not be standard. Accommodating longer kingpin-to-rear-axle vehicles by designing standard roadway design features may be possible,

but context sensitive design should be used, with consideration for the scenic value of SR 1.



All SR 1 projects that introduce nonstandard features shall have an approved DSDD when deviating from HDM standards. This may include projects that would bring the SR 1 facility up to current design standards. These Guidelines can be cited as ancillary documentation in these DSDDs; however, the approval of the DSDDs can be reliant on impacts to specific resources on a project-by-project basis and the need to comply with state laws such as the Coastal Act or local regulations in LCPs. It should also be noted that safety would take precedence in the approval of DSDDs.

For repair projects, the PDT should be aware that there are usually multiple stakeholders who need to be involved in the project development process, consistent with the Context Sensitive Solutions policy and Complete Streets Director's Policy. Along with early coordination with CCC/LCP staff, early community outreach may also be an important element in project development.



The PDT also should note that there are many good reasons to seek out a narrower roadway section or other design improvements. These include avoiding impacts to archaeological resources, sensitive and protected biological resources, and visual resources; as well as topographical and right-of-way constraints, conflicts with context sensitivity and regulatory policy, and excessive costs. Projects are to be designed to accommodate all roadway users. Surrounding land uses, existing and planned pedestrian and bicycle facilities, bicycle and pedestrian plans, and input from stakeholders and agency partners all need to be considered when determining multimodal needs. If there is an identified need to accommodate pedestrian and/or bicycle travel on a replacement facility, planning and development for the facility needs to be coordinated with input from various stakeholders and agency partners. Section 5.3 includes considerations for pedestrian and bicycle accommodations.



Table 5-1 summarizes design recommendations for projects under these Guidelines. These recommendations are further discussed in the subsequent sections. DSDDs are expected to document the application of most of the recommendations.



Table 5-1 Design Recommendations



Design Element	Recommendation	Comments
<p>Roadway Geometrics</p> 	<p>The character of the existing horizontal and vertical alignment should be generally maintained. Curve flattening should be made only when there is an accident history at the location. Design speed should be commensurate: 30 to 40 mph along main streets; 40 to 50 mph in mountainous terrain; and 50 to 60 mph in rolling terrain is acceptable. Pedestrian and bicyclist safety must also be considered.</p>	<p>Where alterations may be warranted, primarily because of a demonstrated crash history, any new alignment should avoid and mitigate resource impacts, be carefully blended in with the existing topography, and be designed to meet the needs of all roadway users. Repair projects should consider alternatives that provide for staying within the existing roadway bench and right-of-way. Avoid encroaching into State Parks lands.</p> <p>Scenic values of SR 1, particularly in areas of natural scenic beauty, must play a part; along with geometric design factors such as vertical and horizontal alignment, and sight distance in selecting a design speed, as well as public access, and pedestrian and bicycle safety.</p>
<p>Lane Width</p> 	<p>Meeting the safety and mobility needs of all roadway users while preserving the existing, scenic two-lane⁷ character of SR 1 is the primary goal. Lane widths will be evaluated on a case-by-case basis considering the safety of all roadway users (drivers, bicyclists, etc.), visual resources and other environmental factors, right-of-way, and cost. The HDM calls for 12-foot standard lanes, and they are predominant on SR 1 in San Mateo County.</p>	<p>HDM Index 301.1 calls for a 12-foot-wide lane. Narrower lane widths should be considered if negative project impacts can be reduced, the design vehicle can be accommodated, the character of the roadway can be preserved, sight distance is adequate, and the needs of all roadway users are met. Additionally, lane widths in towns [urban, city or town centers (rural main streets)] may be 11 feet. Coordinate with stakeholders to ensure consistency with San Mateo County, Half Moon Bay, Pacifica, and Daly City LCPs and town plans.</p>



⁷ There are portions of SR 1 in San Mateo County with dividers and/or more than two lanes. These Guidelines primarily apply to its rural, undivided two-lane portions parallel to the Pacific coast.



Design Element	Recommendation	Comments
<p>Shoulder Width – Rural Locations</p> 	<p>Considerations include avoiding negative project impacts that would be significant under applicable resource protection policies and accommodating cyclists according to project-specific topography and context. Eight-foot shoulders are the HDM standard and are predominant on SR 1 in San Mateo County. Standard 8-foot shoulders may not be possible in certain locations due to physical, safety, and environmental constraints. Four- to 6-foot shoulders may be considered in locations where constructing larger shoulders would have substantial adverse environmental or right-of-way impacts or conflict with a Coastal Act or LCP policy.</p>	<p>DIB 79-04 requires either a 4-foot shoulder or 8-foot shoulder, depending on the average daily traffic of the roadway segment; 4-foot shoulders promote the rural character of the roadway, provide space for multimodal users, and reduce visual impacts caused by the full geometric cross section. Evaluate whether resource constraints would allow 6-foot shoulders for areas identified as Class II facilities in local and Caltrans bicycle and pedestrian plans (see Sections 3.2.7 and 5.3.1, and Appendix D).</p>
<p>Shoulder Width – Towns</p> 	<p>A 5-foot shoulder width should be used where no parking exists; a 13-foot shoulder width should be used where parking exists, to allow space for bicyclists. Striping/painting of bicycle lanes may be appropriate in town settings. The PDT should coordinate with Caltrans bicycle and pedestrian staff, LCP staff, and the local jurisdiction to explore such possibilities.</p>	<p>The 8- or 13-foot shoulder width can be provided in towns to accommodate bicyclists. Pedestrians should be accommodated on sidewalks or paths. Seek out stakeholder involvement when working in towns, to ensure consistency with San Mateo County, Half Moon Bay, Pacifica, and Daly City LCPs and town plans.</p>



Design Element	Recommendation	Comments
<p>Shoulder Width – Bridges</p> 	<p>An 8-foot shoulder width shall be considered on new structures. In constrained locations, when an alternative bicycle path is available, a 6-foot shoulder width may be necessary adjacent to bridge rails and retaining walls, and when required by geometric conditions.</p>	<p>In constrained locations, when an alternative bicycle path is available, a 6-foot shoulder width may be necessary adjacent to bridge rails and retaining walls, and when required by geometric conditions. If there is an identified need to provide connections/access for pedestrian travel on a bridge replacement, such as a gap on a parallel trail, a sidewalk may be considered in addition to shoulders and in coordination with stakeholders and agency partners.</p>
<p>Parking, Pullouts, Unpaved Shoulders, and Turnouts</p> 	<p>No net loss of parking, pullouts, or turnouts. Non-pavement treatments should be used where feasible. Other roadway uses or development of the area beyond the shoulder should be minimized and fit in with the natural environment.</p>	<p>Any pullouts removed should be replaced so as to provide equivalent or better service. Any opportunities to add parking, pullouts, or turnouts should be considered, especially where there is an identified need (such as coastal access points), and where consistent with the San Mateo County, Half Moon Bay, Pacifica, and Daly City LCPs.</p>



Design Element	Recommendation	Comments
<p>Bridge Barriers and Railing</p> 	<p>Bridge railings should be of a see-through type, to allow maximum views and consider all multimodal users. Ensure that the railing height and rail opening widths meet current minimum design standards for both bicyclists and pedestrians, where appropriate.</p>	<p>See-through types of railings are used to allow viewers visual access to the unique scenic qualities of the crossing. Bicycle and pedestrian railings added to a bridge rail can be highly visible, and special attention should be given to the aesthetics of these railings, including consistency with visual resource policies of the Coastal Act and LCPs. The current MASH approved, CCC preferred barrier types are ST-75 and Concrete Type 85. Barrier designs are subject to change over time. The PDT should ensure that any proposed barriers meet the latest MASH standards and are acceptable to the CCC.</p>
<p>Railing</p> 	<p>MGS is the preferred railing type where railing is required. Wooden posts and matte finish on railing should be used where feasible. White barrier markers on top of the MGS should be used in lieu of delineators (Type F White). The PDT should ensure that railing selection is in line with Coastal Act and LCP policies on visual resources.</p>	<p>MGS is a consistent and familiar feature along the SR 1 corridor. It provides transparency, context sensitivity, and is cost effective. Continuity in railing type is important to avoid visual intrusion caused by dissimilar roadside features.</p>


Design Element	Recommendation	Comments
<p>End Treatments</p> 	<p>Where practical, see-through concrete barriers and railings should be terminated with a buried end-section. If not feasible, an in-line end-section should be used.</p>	<p>Buried end-sections and in-line end-sections, as opposed to flared end sections, minimize visual impacts. Design solutions that avoid the need for crash cushions that would cause visual intrusion are encouraged.</p>
<p>Vegetation Control Under MGS</p> 	<p>No vegetation control treatment is required under MGS. Concrete treatment under MGS should be avoided where it has the potential to impact visual resources (e.g., roadway sections with coastal views).</p>	<p>Typical soil coverage for erosion control will be needed.</p>

Design Element	Recommendation	Comments
<p>Non-Safety Fencing</p> 	<p>Where non-safety fencing is needed, it should be wire or timber with timber posts compatible with similar rural fencing in the area. Other fence types should be installed where they are more typical and appropriate for the adjacent land use. On horizontal curve locations, standard sight distances should be met because safety should take precedence.</p>	<p>Wire and timber are common features along SR 1 and in rural and agricultural settings. Chain-link fence should be avoided. Before replacing a stand-alone fence, consider its purpose and need and alternatives. In general, do not add non-safety fencing unless it serves to promote, and is consistent with policies of the affected jurisdiction's LCP.</p>
<p>Slope Stabilization</p> 	<p>Nonstructural options should be considered first. If such options are not feasible, other options that can be revegetated with native plants are preferred. Ensure that any pedestrian and bicyclist needs/uses are factored into the final design.</p>	<p>Nonstructural options are less visually disruptive than retaining walls. Solutions that can be vegetated with locally appropriate native plants that will blend in with the surrounding environment are preferred. See Section 5.6. It is important to evaluate the impact on existing and planned pedestrian access (e.g., public trail or pathway).</p>

Design Element	Recommendation	Comments
<p>Retaining Wall – Timber Lagging Wall</p> 	<p>Timber lagging is typically used for retaining walls required below the roadway.</p>	<p>Timber lagging is visually appropriate for both rural and marine settings. Coat the exposed concrete and metal features to blend into the setting and reduce glare. Dark-brown paint (Federal Standard 595 Color #30051) should be used. Stain should also be dark brown. Wall aesthetic uniformity is important to minimize cumulative visual impacts caused by inconsistency. Conformity with LCPs should be evaluated.</p>
<p>Buried Walls</p> 	<p>Retaining walls should be buried, if feasible, and the resulting slope revegetated with appropriate native plants. The PDT should consider using slopes gentle enough to support vegetation growth or other measures to encourage vegetation growth.</p>	<p>The resulting slope should be evaluated to determine whether a guardrail is required in accordance with Chapter 3 of the <i>Traffic Safety System Guidance Manual</i>. If a guardrail is not required at the time of the project, adequate unpaved area should be provided between the edge of pavement and the retaining wall to accommodate future installation of a guardrail, if warranted. Communicate with Caltrans Traffic Safety on these issues.</p> <p>Any choice between uphill or downhill retaining wall structures should favor that with the least environmental and scenic impact.</p>

Design Element	Recommendation	Comments
<p>Fall Protection Cable Railing</p> 	<p>Permanent fall protection is the HDM standard. Mobile fall protection should be considered and used whenever feasible.</p>	<p>If mobile fall protection cable railing is proposed, a design exception will need to be processed. Permanent fall protection cable railings have the potential to impact visual resources, and conflict with Coastal Act and LCP policies.</p>
<p>Retaining Wall – Carved and Stained Rock Walls</p> 	<p>Soil nail walls with shotcrete are typically used for walls above the roadway. Stain and carve shotcrete to mimic local natural rock outcroppings. Eliminate paved ditch and maintenance railing wherever feasible. Stain all appurtenances to match the wall.</p>	<p>Carved rock walls blend into the natural environment. Staining of the concrete and metal features blend them into the setting and reduce glare. Wall aesthetic uniformity is important to minimize cumulative visual impacts. Attention to aesthetic detail on these walls goes beyond color and texture. Vertical alignment should be adjusted to resemble natural rock formations. The wall face should have a batter to mimic a natural slope aspect. See Section 5.6.2.</p>

Design Element	Recommendation	Comments
<p>Post-Construction Grading</p> 	<p>The graded bench in front of the wall should be evaluated for post-construction long-term uses. The priority is to bury the wall to reduce visual impacts. Slope-rounding techniques should be used to help blend the disturbed areas into the natural landforms.</p>	<p>This area should be discussed with local partners to determine whether the location may be in future plans for the California Coastal Trail and whether it makes sense to leave the bench to facilitate long-term plans.</p>
<p>Drainage Features</p> 	<p>Drainage pipes should be hidden from view where feasible. Pipes that cannot be hidden should be colored with earth-tone coating to conceal them. Concrete drainage features should be colored to match adjacent earth tones. Drainage rock used as dissipaters should be colored earth tone to reduce visual impacts and should be buried with soil and vegetation or obscured with native plantings where feasible. Inlets should be sited outside of where bicyclists are most likely to ride, if feasible, and shall use bicycle-proof grates. Plastic drainage pipes should be avoided in wildfire-prone locations.</p>	<p>Drainage features should be camouflaged to the extent feasible. Drainage features can be highly reflective and visually intrusive if left uncovered or uncolored. Where appropriate, drainage ditches should be designed in conjunction with the shoulder to reduce the amount of pavement and widening needed.</p>

Design Element	Recommendation	Comments
<p>Rumble Strips</p> 	<p>Rumble strips, if warranted, should be placed in the centerline to reduce vehicle crossovers.</p> <p>In accordance with FHWA’s 2011 Center Line Rumble Strip Advisory, it is recommended that 14 feet of pavement be maintained beyond the edge of the center line rumble where vehicles and bicycles are expected to share the lane. This is because rumble strips may cause passenger and commercial vehicles to shy away from the center, effectively moving closer to bicyclists who may be traveling on the outer edge of the lane.</p>	<p>Shoulder and edge-line rumble strips can create control issues for bicyclists. In locations with wider shoulders (8 feet), shoulder rumble strips can be used.</p> <p>Gaps in rumble strips are commonly provided in the vicinity of intersections and driveways to help facilitate bicycle movement into nearby lanes in advance of desired left turns and other potential movements.</p>

Notes:

- Caltrans = California Department of Transportation
- CCC = California Coastal Commission
- DIB = Design Information Bulletin
- FHWA = Federal Highway Administration
- HDM = Highway Design Manual
- LCP = Local Coastal Program
- MASH = Manual for Assessing Safety Hardware
- MGS = Midwest Guardrail System
- mph = miles per hour
- PDT = Project Development Team
- SR 1 = California State Route 1

5.2 Roadway

5.2.1 Design Speeds

The HDM defines design speed as “a speed selected to establish specific minimum geometric design elements for a particular section of highway.” These design elements include vertical and horizontal alignment and sight distance. Although Table 101.2 in the HDM defines the standard design speed for conventional highways in rural, flat terrain as 55 to 70 miles per hour (mph); in rolling terrain as 50 to 60 mph; and in mountainous terrain as 40 to 50 mph, several additional factors must be considered in the final selection of an appropriate design speed.

Many factors influence the choice of design speed, including the terrain, environmental impacts, type and anticipated volume of traffic, functional classification of the highway, needs to address pedestrian and cycling safety, and whether the area is rural or urban. Scenic values are also a consideration in the selection of a design speed.

In addition, the selected design speed should be consistent with the speeds that are likely to be expected on a given highway facility. Drivers adjust their speed based on their perception of the physical limitations of the highway and its traffic. Where a reason for limiting speed is obvious to approaching drivers, they are more apt to accept a lower design speed than where there is no apparent reason for it.

As outlined in Topic 81 of the HDM, it is not always feasible or appropriate—either from a physical or an environmental standpoint—to bring the roadway up to HDM standards; therefore, design speed should be carefully chosen based on considerations such as scenic value and pedestrian and cyclist safety. For SR 1 in San Mateo County, the design speeds listed in HDM Table 101.2 are often significantly above the posted speed limits or above what a driver will achieve or expect to achieve, and therefore need to be lowered (Caltrans 2022c). Additionally, in areas along SR 1 where the speed limit is unposted, it defaults to 55 mph.

Designers should aim to retain the natural curvature of SR 1 because this will protect the character of the highway, calm traffic, enhance the recreational experience, and minimize impacts to adjacent coastal resources. Design improvements along SR 1 that will protect the existing character and sensitive resources should be considered through all practical means, including lower design speeds.

As noted, HDM design speeds can be adjusted to be lower, especially where there are tight curves. In selecting a design speed, scenic values of SR 1, particularly in areas of natural scenic beauty, must play a part—along with geometric design factors such as vertical and horizontal alignment, and sight distance. The chosen design speeds for a project should generally reflect current safe and appropriate speeds for the existing highway geometry as well as the needs of all potential users.

5.2.2 Posted Speeds

Posted speed limits, or speed zones, are set based on the 85th percentile speed of free-flowing traffic. This posted speed may be reduced where an engineering study indicates such a need, based on collision records, roadside development, and other conditions not readily apparent to the driver. The District Traffic Safety Engineer should be consulted for assistance with this procedure. Reference the *California Manual for Setting Speed Limits* (Caltrans 2014a) for the setting process and other details.

Advisory speeds are used to advise motorists of changes in conditions, including roadway horizontal alignment and sight distance. These are determined based on site conditions and are lower than the posted speed limit.

There are several different speed zones in the corridor, depending on the roadway conditions and location. Although the predominant posted speed may be 55 mph, the advisory speed or speed zone is lower where the sight distance is restricted by steep grades or tight horizontal curves. In these areas, design exceptions are often required due to the limited right-of-way and restrictive existing conditions. Some segments may not have been subject to a speed study and are therefore shown as being the default 55 mph. As part of a repair project, especially on a curved roadway section, consideration should be given to performing a speed study and posting or adjusting an advisory speed sign.

5.2.3 Landscape Segments and Speeds

San Mateo County can be categorized into segments based on similar landscape unit types, which are listed below.

Cities: SR 1 in San Mateo County passes through three cities: Daly City, Pacifica, and Half Moon Bay. Speed limits and grades in these cities vary, as do pedestrian and bicycle access. In Daly City, SR 1 trends inland, and access is controlled by on- and off-ramps. There is no pedestrian or bicycle access in this segment.

The segments of SR 1 in Pacifica and Half Moon Bay are relatively flat in grade, with lower speed limits (e.g., 25 mph in school zones, 40 mph in other areas). SR 1 serves as the primary transportation corridor in these cities and includes signalized intersections and crosswalks at multiple points. In these cities, the project team should consider appropriate design speeds and pavement sections.

Unincorporated Residential Areas: Several sections of SR 1 in San Mateo County pass through small towns with driveways that serve commercial and residential areas, including Montara, Moss Beach, Princeton, El Granada, and Miramar. These sections have a higher percentage of bicycle and pedestrian traffic, and typically have posted speeds of 45 to 55 mph and relatively level grades (less than 4 percent).

In these sections, lower design speeds may be appropriate to provide for the needs of both nonmotorized and motorized modes of transportation. Wider pavement sections with appropriate striping should be considered to accommodate bicyclists and pedestrians, with a minimum of 5-foot-wide shoulders where parking is not present and 13-foot-wide shoulders where parking is allowed.

Coastal Bluff, Marine Terrace, Coastal Canyon, Estuary, and Bay Front: These landscape units typically are characterized by winding roadways with steep hillsides along SR 1. Speed zones and advisory speeds in these sections vary, with some areas 35 mph or less, because the roadway geometrics require motorists to travel more slowly to navigate the existing curves and grades. Right-of-way typically is limited in these sections.

Forested: There are sections along SR 1 with eucalyptus, cypress, oak, and pine groves. The roadway in these sections is typically winding, with rolling grades that may exceed 7 percent. Speed zones are typically 35 to 55 mph, with advisory speed locations due to the existing horizontal and vertical curve alignments. Travel lane and shoulder width requirements may change or reduce in size while still accommodating the needs of the traveling public in these sections. Right-of-way may be limited in these areas.

Agricultural/Pastoral: Typically, the agricultural sections have level grades, with grasslands and open farmlands. Speed zones for these sections are typically 30 to 55 mph, with some advisory speed locations at horizontal curves with limited sight distance. San Mateo County LCP policies on maintaining economic, environmental, and social value of agricultural lands should be taken into account when designing highway projects. A narrower cross section may or may not be appropriate in these

areas, but all potential resource impacts should be evaluated to assist in that determination.

5.2.4 Horizontal and Vertical Alignment

Along with user expectations, the existing horizontal and vertical alignments of SR 1 are key factors defining its distinctive character. This character is defined in the context of the landscape segments noted previously. Meeting the expectations of all roadway users is a basic design concept to strive for in all cases; therefore, comprehensive improvements that significantly alter the character of SR 1 from that of the adjacent environment, thus changing the users' expectations and recreational experience, are not normally justified, warranted, or desirable. Minor adjustments to the roadway alignment, which could, for example, remove a broken back curve or provide the necessary superelevation transitions between reversing curves, can often be included on a case-by-case basis. In general, however, realignment of curves should only be considered when there is a demonstrated crash history. Impacts to coastal resources and bicyclists should also be a part of this consideration. The decision to include or not include any roadway improvement needs to factor in the existing alignment and other basic geometric features such as width, sight distance, or the presence/absence of a turn lane; the context of the facility; the crash history of the area; the possible need for traffic-calming features; and the crash potential, both before and after the proposed improvements. In cases where overriding issues call for a realignment, the alignment should be carefully fitted and blended in with the topography in a manner that not only addresses safety concerns, but also fits the character of SR 1 in light of the surrounding landscape and sensitive resources.

5.2.5 Sight Distance, Superelevation, and Horizontal and Vertical Curves

Commensurate with the chosen design speed, the alignment should provide standard stopping sight distance. This basic design standard should be strived for in all circumstances.

An alignment that provides a high degree of drivability is attained when the horizontal alignment and superelevation are consistent with the design speed, and there is sufficient tangent length to attain the superelevation runoff shown in Topic 202 of the HDM. For low-speed facilities, the superelevation rates shown in Tables 202.2A – E can be reduced without sacrificing safety or drivability. The American Association of State Highway and Transportation Officials publication, *A Policy of Geometric Design of Highways and Streets* (AASHTO 2011) provides

guidance on superelevation and speed and may provide additional insights for achieving acceptable project design.

The guidelines for vertical curves in index 204.4 of the HDM provide for highway geometry commensurate with the design speed. In addition, vertical curves that restrict sight distance below standard should be considered for upgrading.

Consideration of whether to modify curvature based on a demonstrated crash history should also include an evaluation of whether there is any indication that the existing roadway geometry or other factors actually contributed to the cause of the crashes. The results of this evaluation must factor into any decision about whether the roadway alignment actually needs to be changed. Lower design speeds should be evaluated as a means to calm traffic and as an alternate to changing a current alignment. Beyond this, any further consideration of any roadway adjustment should only be made to the extent that it is necessary for the design vehicle to stay within the lane—and keeping in balance the potential benefits with the potential adverse impacts, given the context of the facility.

5.2.6 Travel Lanes and Shoulders

The HDM states that the minimum width on two-lane and multilane highways, ramps, collector-distributor roads, and other appurtenant roadways shall be 12 feet, with the exception of several circumstances. Those circumstances include conventional state highways with posted speeds less than or equal to 40 mph and annual average daily traffic (truck volume) less than 250 per lane that are in urban, city, or town centers (rural main streets), where the minimum lane width shall be 11 feet. Shoulder width requirements vary based on the type of facility but are listed in Table 302.1 of the HDM.

The HDM standard roadway section for a new two-lane undivided roadway, such as SR 1 through most of San Mateo County, is two 12-foot-wide lanes with 8-foot-wide shoulders. As stated in Table 5-1, 12-foot-wide lanes and 8-foot-wide shoulders are predominant on SR 1 in San Mateo County. Less-than-12-foot lanes exist in certain locations, such as between the Tom Lantos Tunnels and Rockaway Beach. Figure 5-1 shows the shoulder widths of SR-1 in San Mateo County.



Figure 5-1 Shoulder Widths on SR 1 in San Mateo County

As stated in the HDM, it may be desirable to reduce lane widths in order to add or widen bike lanes or shoulders. In determining the appropriateness of narrower traffic lanes, consideration should be given to factors such as motor vehicle speeds, truck volumes, alignment, bike lane width, sight distance, and the presence of on-street parking. When on-street parking is permitted adjacent to a bike lane, or on a shoulder where bicycling is not prohibited, reducing the width of the adjacent traffic lane may allow for wider bike lanes or shoulders, to provide greater clearance between bicyclists and driver-side doors when opened.

The HDM standard for a new four-lane divided roadway, such as SR 1 north of Pacifica, before it links with Interstate 280, would be four, 12-foot-wide lanes, with 5-foot-wide left shoulders and 8-foot-wide right shoulders. However, for resurfacing, restoration, and rehabilitation projects (also known as 3R), geometric standards for paved shoulder widths, in accordance with DIB 79-04, vary depending on traffic volumes and the width of existing shoulders. The annual average daily traffic for SR 1 in San Mateo County varies from 3,300 to 55,200 vehicles; therefore, in accordance with DIB 79-04, all segments of SR 1 in San Mateo County require 8-foot-wide (annual average daily traffic more than 3,001) shoulders. However, site-specific conditions may warrant further modification of these widths through design exceptions.

It should be noted that CCC and LCP policies generally limit roadway width expansions. Roadway widening may also increase impacts to sensitive habitats – or ESHAs – along the roadway, which may be prohibited or require additional habitat mitigation. Refer to Chapters 3 and 4 for guidance on Coastal Act and LCP policies, and coordination with the CCC and LCPs. However, in those cases where existing shoulders are less than 8 feet, shoulder widening to improve bicyclist safety are encouraged when consistent with the LCP, unless significant ESHA impacts are anticipated.

Due to the highly scenic and sensitive environment and LCP requirements, a 40-foot roadway may not be sensitive to certain parts of SR 1 through San Mateo County. For the majority of SR 1 in San Mateo County, travel lane widths should be 12 feet, with standard 8-foot shoulders. Narrower shoulders may be retained where specified by an LCP policy, or in constrained locations, but projects should also consider shoulder widening up to 8 feet when feasible. In no case should vehicle lanes be widened at the expense of shoulder widths, which take priority for reasons of bicyclist safety. Encroachment on or impacts to sensitive resources in or adjacent to State Parks lands

may warrant narrowing the roadway cross section. Discussions should include the State Parks land manager, and should factor in design vehicle requirements, safety concerns, nonmotorized users, and other site relevant items. Additional adjustments to lane widths may be needed in tight curves to address site distance constraints, or the roadway may need to be narrowed to avoid significant impacts.

Narrower shoulders (less than 4 feet) may be acceptable in some downhill sections where bicycle traffic can reasonably use the full lane width, where wider shoulders would individually or cumulatively adversely affect sensitive environmental coastal resources, or to avoid development outside of the right-of-way without compromising the safety and mobility needs of bicyclists. It should be noted that every downhill section acts as an uphill section for bicyclists in the opposite direction and therefore the narrower shoulder should only be considered for the downhill travel direction.

It may often be appropriate to increase the paved shoulder width in some locations, such as where limited line of sight is present; where pedestrians would be in close proximity to high-speed vehicles; in uphill segments where bicyclists ride at relatively slower speeds than motorists; or where vertical elements, such as Midwest Guardrail System (MGS) or bridge rail, are proposed for extended lengths, limiting the ability of bicyclists to use the full width of the shoulder. Shoulders wider or narrower than 4 feet in a rural environment should also consider the actual or expected volume of bicycle and pedestrian traffic, taking into account site-specific topography and particular user needs from a corridor perspective.

SR 1 also serves as the main street for certain cities and unincorporated residential areas in San Mateo County. Often, a wider roadway section may be the most appropriate and user-friendly solution when it includes parallel parking, bicycle lanes, and sidewalks. These sections have a higher percentage of bicycle and pedestrian traffic and should be given special consideration. In these sections, a 5 or 6-foot-wide shoulder without parking (the HDM calls for a 6-foot bike lane where posted speeds are greater than 40 mph, which is the case in some towns along SR 1 in San Mateo County) and 13-foot-wide shoulder with parking is recommended to accommodate bicycles. A separate pedestrian path/travel way should be provided. Perpendicular and diagonal parking are highly discouraged. Given the various conditions currently existing in towns (e.g., presence of curbs, parallel parking, no parking, informal off-road parking, and sidewalks), a site-specific solution should be derived based on coordination with local officials and in conformance with the San Mateo County, Half Moon Bay, Pacifica, and Daly City LCPs and all applicable local plans as well

as Caltrans Complete Streets policies. Also, see DIB 82-06 (Caltrans 2017) for Americans with Disabilities Act requirements and accommodations.

The location of shoulder-width reductions or tapers back to the existing shoulder width should consider the visibility of bicyclists to motorized traffic. Shoulders on flat or ascending grades should have width reductions where sight distance is not significantly restricted by crest vertical or horizontal curves. This allows bicyclists to transition from the shoulder to the lane in full view of motorized traffic. This provision is less of a concern in downgrades where bicyclists are expected to use the full lane width. However, as stated above, every downhill section acts as an uphill section for bicyclists in the opposite direction.

5.3 Bicycle and Pedestrian Facilities/Active Transportation

Bicyclists and pedestrians are frequent users of SR 1. Although parallel separated facilities or standard bicycle lanes are not always feasible in the existing right-of-way for certain stretches of SR 1, these developments should be considered in projects for inclusion, as well as opportunities to Caltrans to meet its legislative and policy mandates to improve active transportation and complete the California Coastal Trail. All options for accommodating cyclists and pedestrians should be considered in a context sensitive manner, with an eye toward including cycling improvements where the needs and opportunities are the greatest—especially considering the intended user type, level of traffic stress, and the Three Feet for Safety Act. Such proposals should address whether there are substantial visual impacts or substantial negative impacts to sensitive environmental resources in State Parks lands or the Coastal Zone. Bicyclist-appropriate railings, at the minimum allowable height, should be considered on barriers, walls, and bridges. Type selection and placement criteria for railings and guardrails should attempt to maximize current (and potential future widened) shoulder widths and account the comfort of bicyclists riding closely alongside the barrier.

Guidance on planning and designing for bicyclists of all ages and abilities within a highway context can be found in the Division of Transportation Planning Memorandum on Contextual Guidance for Bike Facilities and the Division of Design Memorandum on Bikeway Facility Selection Guidance.

It should be noted that, in San Mateo County, pedestrians and bicyclists are currently prohibited on SR 1 north of Westport Drive in Pacifica. However, pedestrians and bicyclists should be considered in all projects and opportunities to provide off-

highway public access are still appropriate and should be developed when feasible. Dedicated pedestrian facilities should be incorporated into projects in coordination with local stakeholders.

5.3.1 Bicycle and Pedestrian Plans and Policies

Deputy Directive 37, which was signed on December 7, 2021, provides definitions of and guidance on complete streets (Caltrans 2021b). It states that, in locations with current and/or future pedestrian, bicycle, or transit needs, “all transportation projects funded or overseen by Caltrans will provide comfortable, convenient, and connected complete streets facilities for people walking, biking, and taking transit or passenger rail unless an exception is documented and approved.” The *District 4 Pedestrian Plan* and *District 4 Bike Plan* provide guidance on active transportation needs throughout the district, including SR 1 (Caltrans 2021a; Caltrans 2018a).

In addition to Caltrans’ policies and plans, there are a number of regional and local transportation planning documents and studies that guide pedestrian and bicycle transportation improvements along SR 1 in San Mateo County: City/County Association of Governments (C/CAG) of San Mateo County *San Mateo County Comprehensive Bicycle and Pedestrian Plan* (C/CAG 2021), the *Unincorporated San Mateo County Active Transportation Plan* (San Mateo County 2021a), *Connect the Coastside* (San Mateo County 2021b), *Walk Bike Daly City* (City of Daly City 2020), the *Pacifica Bicycle and Pedestrian Master Plan* (City of Pacifica 2020b), and the *Half Moon Bay Bicycle and Pedestrian Master Plan* (City of Half Moon Bay 2019). Collectively, these documents set policy, programmatic, and project-specific recommendations for pedestrian and bicycle transportation for the entirety of SR 1 in San Mateo County. See Appendix D for a list of identified bicycle and pedestrian projects needs along SR 1 in San Mateo County.

Bicycle and pedestrian facilities along SR 1 in San Mateo County should adhere to Caltrans’ standards. The following definitions of bikeways should guide this process:

- Class I bicycle paths are a completely separated facility for the exclusive use of bicycles and pedestrians, with crossflow by motor vehicles minimized. Designers should offer recreation or high-speed commute routes when motor vehicle and pedestrian conflicts are minimized. These facilities are typically provided along rivers, ocean fronts, canals, parks, etc.
- Class II bicycle lanes or buffered bicycle lanes provide a striped lane for one-way bicycle travel on a street or highway. Buffered bicycle lanes are separated by a

marked (not physical) buffer between the bicycle lane and the traffic lane or parking lane.

- Class III bicycle routes provide for shared use with pedestrian or motor vehicle traffic either to (1) provide continuity to other bicycle facilities (typically Class II); or (2) designate preferred routes through high-demand corridors. Class III bicycle routes are established with bicycle route signs and shared roadway markings along the route. Class III bicycle routes can be made more comfortable for bicyclists with the addition of other devices to encourage slower speeds and reduced traffic volumes.
- Class IV separated bikeways provide for exclusive use of bicycles (cannot be used by pedestrians or vehicular traffic) and include a horizontal and vertical separation (e.g., flexible posts, on-street parking, or grade separation) required between the separated bikeway and through vehicular traffic.

5.3.2 Planned Bicycle and Pedestrian Facilities

Several planning documents and studies by local jurisdictions and Caltrans have identified planned bicycle and pedestrian facilities, as well as needs, along the coastal SR 1 corridor in San Mateo County. See Appendix D for a list of relevant documents and studies, and Appendix D for a list of identified needs. Planned facilities that are outside of the SR 1 roadway, such as parallel Class I bicycle paths, are less likely to be incorporated into repair projects. Where Class II bicycle lanes are proposed on SR 1, a minimum of 6 feet for each shoulder should be provided to accommodate planned bicycle lanes. See Table 5-1 for design recommendations on facilities currently available to bicyclists and pedestrians. Reference Appendix D for guidance on where planned bicycle and pedestrian facilities are proposed by various regional and local plans.

5.3.3 Bicycle and Pedestrian Crossings

Repair projects should consider the need to maintain or add improvements for safe crossings, such as where a trail crosses SR 1, parking areas that require crossing SR 1, connections to and from bus stops, and to other attractions such as commercial areas, beaches, and parks. Where a need is identified to channelize pedestrians to cross the highway at a defined location, the Office of Traffic Safety evaluates the need to mark an uncontrolled crossing on a case-by-case basis. At uncontrolled crossings, elements such as signage, high-visibility crosswalks, or other traffic control devices should be considered and incorporated into the project design as appropriate. See Appendix D

for a list of planned crossing locations (new or enhanced). Additional crossing location needs may be identified through subsequent planning efforts at the corridor or project level.

5.3.4 California Coastal Trail

The California Coastal Trail (CCT) is a product of multiple regulations and state and federal policies, including the following:

- The Coastal Act, which calls for protecting and providing maximum public access to the shoreline, including such measures as a statewide coastal trail system (PRC Section 30210-30214, 30220-30224);
- Section 31408 of the State Coastal Conservancy Act of 1976 (PRC Section 31000 et al.), which calls for the California Coastal Conservancy (Conservancy) to have a principal role in the implementation of a coastal trail;
- State and federal designation of the CCT as California’s Millennium Legacy Trail in 1999;
- Senate Bill 908, passed into law in 2001, which requires the CCC and State Parks to coordinate with the Conservancy to assist the completion of the CCT; and
- Assembly Bill (AB) 1396, passed into law in 2007, directs Caltrans to coordinate development of the CCT with the Conservancy, State Parks, and the CCC. Under this bill, Caltrans is responsible for notifying the Conservancy quarterly, as well as other specified agencies, regarding excess property suitable for the CCT. In addition, the law requires that provisions for the CCT be included in regional transportation plans and that, to the extent feasible, state agencies with property interests or regulatory authority along the coast cooperate in planning and making lands available for the completion of the trail, including constructing trail links, placing signs, and management.

The CCT is envisioned to be a continuous, interconnected, braided public trail system along the California coastline. The CCT may take the form of an informal footpath, shared sidewalk, or bicycle path; or, where no other alternative exists, may connect along the shoulder of the roadway, on either an interim or a permanent basis.

Although primarily for pedestrians, the CCT is intended to accommodate a variety of users, including bicyclists, wheelchair users, equestrians, and other complementary forms of nonmotorized transportation.

Caltrans is supportive of the CCT, and designers should consider the alignment of the CCT when designing damage repair solutions. Repair projects should be designed to address any trail considerations that may fall within a project limit and to not preclude future development of the trail. Information on the alignment of the CCT is available on CCC's web site (CCC 2019). The alignment is also shown in an online map viewer.⁸ Contributing to links in the CCT within a project's limits is a potential strategy for mitigating unavoidable project impacts to public coastal access and should always be considered for feasibility. Caltrans designers should contact CCC staff and the County of San Mateo Parks Department and State Parks to evaluate the potential for collaboration on coastal trail development for projects along SR 1 in San Mateo County.

5.3.5 SR 1 Parallel Trail

The SR 1 Parallel Trail (Parallel Trail), also known as the Midcoast Multi-Modal Trail, is a planned bicycle and pedestrian commuter trail east of SR 1 in San Mateo County. The trail will span from Montara to Miramar, where it will connect with the Naomi Partridge Trail in Half Moon Bay. As with the CCT, the Parallel Trail's alignment should be considered when designing damage repair solutions, to support and maintain pedestrian and bicycle accessibility. Additional information on the Parallel Trail is available on the Midcoast Community Council's website (MCC 2022) and in San Mateo County's planning documents, such as Connect the Coastside.

5.3.6 Parking, Pullouts, and Turnouts

Vehicles frequently park or pull off the travelway and onto the shoulders of SR 1, and their drivers and passengers may become pedestrians to observe the scenic vistas or access the coast. It is important to consider surface treatment, safety, and the potential to block bicycle and/or pedestrian access when considering accommodating parking or pullouts on the shoulder. Consider sight distance requirements and other safety issues when creating new parking and pullout locations. Any new pullouts or parking areas should be consistent with the applicable LCP. Consultation with State Parks is

⁸ URL: <https://the-california-coastal-trail-1-coastalcomm.hub.arcgis.com/>

necessary regarding the addition, retention, or removal of any parking, pullout, or turnouts when within its jurisdiction.

Bicycle pullouts may also be considered on uphill locations or at the top of an ascending grade when 4-foot or wider shoulders are not present to allow bicyclists to rest or let other users pass safely. Scoping of bicycle pullout locations should be considered on a case-by-case basis, based on engineering judgment. Additional treatments should be considered, with stakeholder and agency partner input, where pullouts are intended as bicycle refuge, to encourage safe passing of cyclists at ingress/egress points and to discourage vehicular parking if not close to a trailhead or other public access points.

Existing pullouts should be preserved when feasible. If projects warrant the removal of an existing pullout, it should be replaced in an appropriate location so there is no net reduction in the number of pullouts.

5.4 Bridges

Bridge width, the design of the bridge, and selection of the barrier and railing type for the structure should complement the existing surroundings. Stakeholder involvement should be part of any bridge replacement project. Bridge recommendations are not included in these Guidelines and should be developed as part of project-specific development process.

5.4.1 Bridge Barriers and Railing

Each bridge is unique. Accordingly, the bridge type and associated railing should be determined on a case-by-case basis. Bridge type, in addition to structural requirements, should also consider pedestrian and bicycle access, view opportunities from the structure, and bridge visibility from the surrounding area. The railing type should consider the safety of motorists, bicyclists, and pedestrians, while also being visually compatible with the surrounding landscape.

The PDT may reference *Bridge Rails and Barriers: A Reference Guide for Transportation Projects in the Coastal Zone* (Caltrans Undated), a document developed in collaboration between Caltrans and the CCC, or the most current Caltrans guidance developed in consultation with the CCC. The next section addresses barriers and railing options, along with some benefits and disadvantages to consider when selecting a railing.

5.5 Guardrail, Railing, End Treatment, and Fences

Roadside safety devices, such as guardrail and metal or concrete railing, are common features along the SR 1 corridor. Following is a brief description of railing considerations along the SR 1 corridor.

Fencing is also a common feature in the SR 1 corridor along many of the agricultural, recreational, and residential areas. Depending on the location, fencing may be privately or publicly installed and maintained.

5.5.1 Railing

Caltrans is committed to using railings that minimize visual impacts along the coast and comply with jurisdictions' LCPs. There are several types of Caltrans standard railings that can be considered for use along SR 1. Caltrans has approved *Manual for Assessing Safety Hardware*-tested barriers for use on the State Highway System. Designers should refer to the *Bridge Rails and Barriers: A Reference Guide for Transportation Projects in the Coastal Zone* (Caltrans undated) as a reference for the types of barriers that are acceptable, though updated versions of the rails in that guide have recently been used in the Coastal Zone.

Designers should carefully consider the safety of all users and the compatibility with the surrounding environment when selecting a railing type. Designers should ensure that the railing height and rail opening widths meet current standards for both bicyclists and pedestrians, where appropriate. As stated in Section 5.3, type selection and placement criteria of railing should account for bicyclists. Consult the District Landscape Architect to ensure visual compatibility with the corridor.

Designers should note that the use of visible anchor blocks in conjunction with railing (e.g., when transitioning guardrail to older bridge railing) should be avoided where feasible. If the use of anchor blocks is determined to be necessary (i.e., due to accident data for a specific roadway segment), anchor blocks should have a minimalistic footprint. Designers should consult with CCC and LCP staff, as applicable, as anchor blocks of a substantial height or length may not be approvable in the Coastal Zone.

Midwest Guardrail: MGS with wooden posts is the predominant railing type currently seen along SR 1 in San Mateo County. It is considered the best railing option for several reasons, including compatibility with existing roadway features, good transparency, context sensitivity, cost effectiveness, its current inclusion in the

Standard Plans, and the fact that Maintenance has the materials for repair readily available. Where site conditions allow, wooden posts should be used. No under-guardrail treatment is required. The guardrail should have a matte finish applied to the final coating to reduce glare. White Barrier Markers on top of the MGS should be used in lieu of Delineators (Type F White). Other approved guardrails may be considered for aesthetic reasons or other limitations. Consult the District Landscape Architect to ensure visual compatibility with the corridor.

5.5.2 End Treatments

End treatments for railing and concrete barriers are also important elements. The designer should select the appropriate approved end treatments for the railing and concrete barriers based on several factors, including the design speed and geometrics of the roadway, maintenance considerations, availability of replacement parts, safety for all users, and consistency along the SR 1 corridor. Where feasible, railings and barriers should be terminated with end sections buried in an adjacent slope or an earthen berm. The height of berms used for buried end sections must be sufficient for standard installations. If burying end sections is not feasible, inline end treatments should be considered. Large, flared end terminals and alternative end treatments such as barrels or crash cushions should be avoided because they cause visual impacts.

5.5.3 Fencing

Right-of-way fencing is an uncommon feature on SR 1, but may be found along many of the agricultural, recreational, and residential areas. The vast majority of fencing along the highway is privately owned. Caltrans may construct private fencing only as a right-of-way consideration to mitigate damages (e.g., to replace existing fencing damaged or altered by a Caltrans construction project).

Fencing may be state owned. If so, consider its purpose and whether it needs to be replaced or whether there are alternative means for meeting that purpose. Avoid non-safety fencing unless it serves to promote and is consistent with policies of the applicable city or county LCP. The fencing type should be consistent throughout the SR 1 corridor and should be functional. Chain-link fencing should be avoided, unless required for specific security purposes, and only if options that are more compatible are not available, and with consultation with CCC or LCP staff. Depending on location and context, desirable fence types include the following:

- Wire (barbed or smooth) on timber or steel posts
- Stretched cable on timber posts

- Timber post and rail (single or multiple rails)
- Timber post and split rail (applicable to forested settings)
- Timber post and pickets
- Hybrid designs combining a variety of the above elements and other types of fences typical to the specific location (e.g., picket fences in towns or corral fencing in ranch areas) that are consistent with the applicable city or county LCP provisions or local plans (Design Guidelines, No. 25 Coastal Zone Design Guidelines, Fences, page 178) (San Mateo County 2013a; City of Half Moon Bay 2020; City of Pacifica 2020a; City of Daly City 1984)

Newly installed steel fencing should be colored to better blend in with the surrounding environmental setting and rural character.

Fencing should not create a visual barrier to the scenic landscape and should be as low in height as feasible. Nor should it create a barrier to wildlife. Consult with the adjacent public land manager to determine appropriate treatment options.

The previously listed points are applicable whether the fence is private or a Caltrans fence. See Topic 701 of the HDM for an in-depth discussion of the various types of fences Caltrans constructs.

5.5.4 Temporary Barriers

Temporary barriers are typically used during maintenance and construction activities to protect workers and the traveling public. Temporary barrier usage is intended to be used short term. Use of temporary concrete barrier in a semi-permanent context (e.g., to shield an active slide area or rock fall area) requires an exception to traffic safety system standards and approval from Caltrans Headquarters (Caltrans 2022d). If temporary concrete barrier is used in a semi-permanent context, the expectation is that the barrier shall remain in place only for the duration of time necessary to plan, program and deliver a project with a permanent barrier to replace the semi-permanent barrier at the location.

Temporary railing (Type K), also known as k-rail, is a common type of temporary barrier used for maintenance and projects. Per Caltrans' Traffic Safety Systems Guidance, k-rail will only be allowed on projects advertised through December 31, 2026. After that date, Manual for Assessing Safety Hardware (MASH) 2016 approved temporary barrier systems must be used instead.

5.6 Slope Stabilization

Due to the extreme terrain and frequent landslides along the SR 1 corridor, structural and nonstructural slope stabilization systems are often necessary. Nonstructural options should be used over structural systems, where feasible. The location and type selection of slope stabilization should consider and minimize impacts to existing and planned public access.

5.6.1 Nonstructural Slope Stability Recommendations

Nonstructural slope stability solutions are generally more cost effective and less visually disruptive than structural solutions. Nonstructural systems that can be revegetated are encouraged because these systems have the potential to blend more fully into the surrounding landscape when mature. Slope stabilization products such as rock bolts and metal mesh can be colored to blend into the environment. Contact Landscape Architecture to determine whether the metal features of the rock stabilization products need to be colored to blend into the environment. The most appropriate nonstructural solution for a specific site should be determined by the geotechnical engineer and geologist. Refer to Section 5.8 for a discussion on landscape and erosion control. Some examples of nonstructural solutions include, but are not limited to, the following:

- Slope reconstruction
- Rock slope protection
- Geosynthetic stabilized embankments
- Embankment confinement systems
- Rock drapery or anchored mesh
- Rock bolting

5.6.2 Retaining Walls

A wide variety of retaining wall options is available to engineers in the event that a structural wall is the most appropriate alternative to stabilizing a slope. In general, retaining walls can be categorized into two broad categories: cut-slope walls (which are typically found in the upslope section of a roadway) and fill walls (which are typically found in the downslope section of a roadway). The geotechnical engineer, the structural engineer, and the geologist will determine the most appropriate retaining wall type, height, and length for a specific site. Safe maintenance access must be considered in the design and layout of retaining walls.

From a visual standpoint, the final appearance of the wall surface, wall height, length, and top elevation have a visual impact and should be consistent with the surrounding context. These guidelines call for burying walls and planting with native vegetation. The slope and design of walls and fill should consider the long-term support of native vegetation. The District Landscape Architect should be consulted.

5.6.2.1 TIMBER LAGGING WALLS

The primary preference for the appearance of retaining walls consists of a timber lagging aesthetic treatment.

The H-piles and timber lagging should be painted a dark brown with a matte finish. The walers (if necessary for tieback anchors) should be stained a dark brown to match. Federal Standard 595 Color #30051, dark brown, is the preferred color choice.

Burying the walls is recommended to minimize visual impacts, and native vegetation should be used to further improve visual conditions.

Where concrete barriers are incorporated into the retaining walls and the wall is exposed, the barrier should be stained to match the color of the wall.

In some locations, another treatment may be preferred. Consult with the District Landscape Architect to determine appropriate treatment.

5.6.2.2 CARVED AND STAINED ROCK WALLS

The secondary aesthetic preference consists of a carved rock aesthetic treatment that is stained to match the surrounding rock formations. This treatment is similar to the finish found on most soil nail walls along the coast, although this appearance can be achieved on other wall types as well. In some locations, stained concrete may be preferred over carved and stained rock walls.

Where concrete barriers are incorporated into the retaining walls, the barrier should be stained to match the color of the wall.

Walls should be discussed with the District Landscape Architect to ensure that the aesthetic treatment selected is acceptable from a visual standpoint.

5.6.2.3 FALL PROTECTION

Under usual standards, fall protection is required at the top of all retaining walls greater than 30 inches in height. Due to the visual impacts, however, the use of standard cable railing should be avoided. Consult with the Division of Maintenance

on the need to access the top of a wall and, if access is needed, determine whether mobile fall protection (e.g., safety cable attached to a Maintenance vehicle) or a safety cable provide the required fall protection. If so, do not install cable railing. If fall protection is required on an uphill wall, cable railing should be colored to blend in with the environment. Chain-link railing should be avoided as fall protection in favor of one of the previously listed solutions.

For cases where new safety cable or railing must be installed, but would be visible from the roadway and would negatively affect the scenic character of SR 1, existing safety cables, railings, fencing, or roadside appurtenances within the project limits should be evaluated for removal to keep visual clutter to a minimum.

5.6.2.4 SLEEPER SLABS

Sleeper slabs, if used for the installation of barrier railings at retaining walls, should be treated to match the remainder of the roadway. The sleeper slabs may be lowered and overlaid with a thin layer of asphalt concrete pavement, or may be colored to blend in with the surrounding roadway surface.

5.6.2.5 DRAINAGE DITCHES BEHIND WALLS

Concrete drainage ditches behind retaining walls should be stained or treated to blend into the surrounding landscape.

5.7 Roadside Features

5.7.1 Drainage

The safety, functionality, and aesthetics of drainage systems should be carefully reviewed and considered. This section discusses the aesthetic treatments that should be considered when installing drainage systems. Slope protection or concrete should be treated to blend with the surrounding landscape. Drainage should be designed to avoid erosion and sedimentation, and to avoid contributing to destabilization of slopes. Existing drainage features will be evaluated at storm damage repair sites. Where feasible, improvements should be incorporated into the new roadway facility to avoid further erosion and sedimentation.

5.7.2 Headwalls and Wingwalls

Typically, aesthetic treatments are not required. However, due to the highly scenic nature of SR 1, headwalls and wingwalls should be as minimal as feasible to avoid impacts to coastal resources and aesthetic treatments should be considered to ensure

that headwalls and wingwalls blend into the existing landscape. Such treatments may include stained or integrally colored concrete to match the surrounding landscape.

5.7.3 Pipes and Inlets

To the greatest extent possible, these drainage facilities should be buried or hidden from view, or obscured with native plantings. Exposed pipes and end sections extending from walls or hillsides, including galvanized pipes, should be treated to blend into the adjacent landscape. The preferred color is Federal Standard 595 Color #30051, dark brown, with a matte finish to reduce glare.

Drainage inlets should be sited outside of where bicyclists are most likely to ride; inlets placed within the roadway must use bicycle-proof grates.

5.7.4 Outfalls

New pipes and culverts should discharge at established drainage outfalls.

Drainage outfalls that can be buried and revegetated, or otherwise obscured, are preferred and should be used when site conditions allow. Revegetation considerations are discussed in Section 5.8.

5.7.5 Ditches

The ditches should be designed to blend into the surrounding landscape. Concrete and metal facilities should be treated to match the surrounding terrain. Where appropriate, drainage ditches should be designed in conjunction with the shoulder to reduce the amount of pavement and widening needed, following the guidelines in Chapter 830 of the HDM.

5.8 Landscaping and Revegetation

5.8.1 Revegetation and Erosion Control

Native plant communities contribute to the scenic nature of SR 1. The objective for revegetation for all areas disturbed by roadside repairs, including construction access and staging areas, is to reestablish native vegetation that integrates and matches adjacent intact native plant communities without introducing nonnative species into weed-free native communities. Designers should specify seed and plant material from local sources whenever feasible. Consult with the Project Biologist and Erosion Control Specialist for recommendations on appropriate plant species. Designers should look for opportunities to cover features such as rock slope protection and drainage pipes with weed-free soil and locally appropriate plant material to achieve

revegetation objectives. Because inadvertent application of soil that contains high-priority weed species propagules can create a large maintenance issue, it is essential that all soil sources be examined by an individual familiar with high-priority weed species prior to application to avoid accidental introduction.

Where the project is adjacent to or on State Parks lands, Caltrans may enter into a planting agreement with State Parks. The PDT should contact the District Landscape Architect and project generalist to initiate the process early in project development. The District Landscape Architect and project generalist will then coordinate with State Parks to facilitate a planting agreement. The agreement shall cover work on areas disturbed in the state right-of-way and on State Parks lands. The scope of work for revegetation, weed management, and erosion control plans will generally include (1) collection of local seed and propagation of local plant material, if not available from commercial sources; (2) planting installation and plant establishment on state rights-of-way and State Parks land for up to 5 years; and (3) exotic weed management. Consult the Caltrans Office of Landscape Architecture for project-specific best management practices, erosion control plans, and special provisions.

For projects in areas outside of State Parks, the PDT team is encouraged to look for partnership opportunities for plant establishment and long-term weed abatement or other non-native species removal.

5.8.2 Invasive and Exotic Vegetation Control

The first line of defense—and the most cost-effective long-term strategy against invasive weeds—is preventing them from becoming established. Prevention and exclusion of noxious weed species are the most practical and economical means of weed management. This is accomplished by ensuring that seed or reproductive plant parts of new weed species are prevented from being intentionally or unintentionally introduced to an area. Best management practices for invasive exotic weed prevention are already incorporated into standard special provisions and include preventative measures, such as equipment washing and seed testing.

Outbreaks of invasive weeds should be controlled during the plant establishment period, if applicable. Nonstandard special provisions requiring the contractor to perform more aggressive management practices may be needed to control invasive weeds during the plant establishment period.

When working in or adjacent to State Parks lands, the PDT should make early contact with the agency to develop vegetation control plans that are in concert with resource

management programs that may involve a multi-year process of seed gathering and propagation. Partnering with these agencies to perform plant establishment and/or long-term maintenance activities is also recommended. Control of exotic vegetation should be covered in the agreement discussed in Section 5.8.1.

5.8.3 Signage

Signage guidelines should follow the fundamental principle that “less is more” with regard to SR 1. Only signs that are necessary for the safety of the traveling public and those that convey essential information to the traveler, including wayfinding and directional signs, should be installed. The design and placement of signage should be in accordance with the latest edition of the *California Manual of Uniform Traffic Control Devices* (Caltrans 2014b). Signs should be combined onto existing posts, where feasible. Signs for the CCT should be provided, where applicable. Projects should also look for opportunities to remove signs that are no longer necessary or serving a public purpose.

5.8.4 Delineators

The use of Type E delineators can impair the scenic value of the highway. Consider eliminating or not using these. If needed and application is intended, please document compelling reasons why they are necessary despite negative visual impacts. In areas with MGS present, use white concrete barrier markers mounted on top of the posts in lieu of the Type E delineator. Use 6-inch-wide high-visibility stripes instead of delineators where MGS is absent.

5.9 Miscellaneous

5.9.1 Fish and Wildlife Connectivity

Repair projects should evaluate potential impacts to terrestrial and aquatic wildlife passage. Examples of repair actions that could affect wildlife passage include the following:

- In-water work
- Work in or adjacent to a stream crossing, bridge, or culvert
- Installation of fencing, netting materials, or other devices that could impede or entangle wildlife species **

Where pertinent, designers should coordinate with environmental staff, including the District Biologist, to thoroughly assess potential impacts. If there is any potential for such impacts, the PDT will coordinate with CCC or LCP staff and the CDFW and/or

National Marine Fisheries Service (NMFS) to incorporate wildlife passage into the project design.

Repair projects should include, where appropriate, safe crossings for terrestrial and aquatic wildlife; and other accommodations to promote biodiversity and avoid or mitigate harm to individual animals, the fragmentation of plant and animal habitats, and the disruption of natural systems. Caltrans should work with its partners to identify wildlife corridors and adopt measures appropriate for the project and context that would work to direct animals under, over, and away from moving vehicles for projects along SR 1. Examples of wildlife passage enhancements include: installing larger culverts or expanding existing culverts to maximize wildlife passage where roadways bisect core habitat areas; opportunities to install safe highway crossings for wildlife; installation of directional fencing to keep wildlife off the roadway or guide species to existing crossings; installing median barriers that have spaces large enough for smaller animals to pass through; creating escape ramps “jump outs” that enable larger mammals (e.g., deer) to leap over fencing to safe ground where they could become trapped in the right of way. Repair projects should consider wildlife crossings and guidance provided in the Wildlife Crossings Guidance Manual (Caltrans 2009). For regulatory context on aquatic and terrestrial wildlife passage, see Fish and Wildlife Connectivity in Appendix A.

5.9.2 Construction/Maintenance Access Roads

Construction access roads shall be built to the smallest dimensions possible. Construction access roads or benches that are built to facilitate construction activities should be regraded using slope-rounding technique and revegetated to match the existing terrain once construction is complete (see also Section 5.8).⁹

If the construction roads are needed for future maintenance access, they should be minimized in width and length, and seeded with erosion control. Local partners should be consulted to determine whether the maintenance access road has potential for incorporation into the CCT.

5.9.3 Scenic Highway Status

The HDM defines a scenic highway as a “state or county highway, in total or in part, that is recognized for its scenic value, protected by a locally adopted corridor protection program, and has been officially designated by Caltrans.” SR 1 from the

⁹ Construction and access roads should be limited to minimize the potential for impacts.

Santa Cruz County line to the southern limits of Half Moon Bay is an officially designated scenic highway. The remainder of San Mateo Route 1 is currently eligible for scenic highway status and, if status is awarded, specific requirements will be triggered, including special signage along SR 1.

Minimize repair project impacts, individually and cumulatively, to the characteristics that make these segments eligible for Scenic Highway status.

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Appendix A Additional Environmental and Permitting Considerations

General Plans

There are four general plans relevant to these Guidelines: those of San Mateo County, and the Cities of Half Moon Bay, Pacifica, and Daly City. The San Mateo County General Plan Polices were updated as recently as 2013, and can be accessed online (San Mateo County 2013b). The Half Moon Bay and Pacifica General Plans are currently undergoing updates; select sections of their draft plans are available online (City of Half Moon Bay 2016; City of Pacifica 2014). The Daly City General Plan, adopted in March 2013, is available in its entirety (City of Daly City 2013). The Cities' general plans consist of different elements (e.g., Circulation, Conservation and Open Space, or Noise) that outline important regulatory frameworks and policies to guide the future of their jurisdictions.

State Parks Policies

State Parks has extensive policies that direct the management and use of their lands. These policies span natural resource protection, transportation, recreational uses, and protection of their viewsheds. These policies affect activities in and adjacent to State Parks lands. SR 1 traverses parks at various locations in San Mateo County. A selection of State Parks policies is presented in the following subsections and should be considered when projects occur adjacent to or may affect these lands.

State Parks policies relating to SR 1 include the following:

- ***Department Operations Manual, State Parks (0304.2.3) (State Parks 2010).***
The purpose of State Parks shall be to preserve outstanding natural, scenic, and cultural values; indigenous aquatic and terrestrial fauna and flora; and the most significant and representative examples of ecological regions.
- ***Department Operations Manual, Scenic Values and Viewshed (0312.2) (State Parks 2010).*** The principal objective in the management of scenic areas is preservation of the quality of the visual environment. More specific objectives in scenic resource management should include the following:
 - Identify and protect scenic resources and qualities.

- Avoid or minimize modifications to scenic resources.
- Remove intrusive human-made elements that are not significant cultural resources, including intrusive light and noise.
- Where modifications of scenic resources are necessary, design attractive structures that are subordinate to the character of their surroundings and that appear to belong to their setting, in sympathy with the sense of place.
- Locate structures in the background as much as possible, isolated from primary views.
- Use visually harmonious materials, colors, textures, and scale that blend into and are subordinate to their landscapes' background.
- Unify structures on the site with a consistent style of architecture and materials.

State Parks has additional policies, not highlighted above, that may be applicable depending on the project location and scope. The project team will coordinate with State Parks to consider policies beyond those that are identified above. Protection of scenic resources goes beyond State Parks boundaries. Development outside of the park boundary that is out of scale with its surroundings, that has contrasting colors or reflective surfaces, or is poorly sited, can impact views from within the park.

Overview of Federal and State Environmental Regulations

In addition to the policies and restrictions unique to the Coastal Zone, SR 1 repairs in San Mateo County are subject to regulations that apply to all project activities in California in general. Depending on the scope of the damage, the location, and the necessary response, Caltrans may be required to obtain permits, concurrence, or other approvals from the following entities: California Department of Fish and Wildlife (CDFW), the California Regional Water Quality Control Board, State Parks, the United States Army Corps of Engineers (USACE), the United States Fish and Wildlife Service (USFWS), the State Lands Commission, the Gulf of Farallones National Marine Sanctuary, National Marine Fisheries Service, and others. Each of these agencies examines Caltrans' efforts through a different lens and policy, adding another layer of complexity to the regulatory matrix that applies to any SR 1 repair project.

For a comprehensive list and description of these requirements, refer to Caltrans' Standard Environmental Reference (Caltrans 2022a). An overview of those requirements is presented below.

For damage repair projects adjacent to State Parks lands, or other areas of exceptional scenic quality, including the Coastal Zone, Caltrans should consult with the affected land manager as early in the planning process as possible, before project scoping and at approximately the 30, 60, and 90 percent design reviews; this will ensure that all feasible measures to avoid and minimize harm are incorporated, public lands resources are considered in the project development process, and resources are adequately protected. In addition, designers are encouraged to engage with resource agencies, such as State Parks, throughout the project development process to keep the lines of communication open and to learn of potential concerns or conflicts as well as opportunities. This collaboration and coordination will need to be managed to keep the project on schedule and to minimize potential impacts to sensitive biological and cultural resources.

National Environmental Policy Act (1969)

The National Environmental Policy Act (NEPA) applies when the project is entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies. When Caltrans road projects are federally funded, Caltrans must complete a NEPA evaluation of the effects of the project on the human environment (comprising economic, social, and environmental impacts). NEPA compliance also requires compliance with all federal laws under the NEPA “umbrella,” including the National Historic Preservation Act, the federal Endangered Species Act (FESA), and Section 4(f).

California Environmental Quality Act

The California Environmental Quality Act (CEQA) maintains a quality environment for the people of California by giving the people responsibility for engaging in the environmental review process. CEQA applies to governmental action, which may involve (1) activities directly undertaken by a governmental agency, (2) activities financed in whole or in part by a governmental agency, or (3) private activities that require approval from a governmental agency. Any California agency with discretionary approval (the “lead agency”) over such an action that has the potential to affect the physical environment (a “project”) must complete a CEQA determination that is subject to public scrutiny before approval may be granted.

Caltrans will prepare an environmental document that describes the project and assesses its impacts. Depending on the extent of the impacts, additional mitigation work may be required. For details on the process, refer to Caltrans' Standard Environmental Reference (Caltrans 2022a).

Clean Water Act of 1977 and 1987

The purpose of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of waters through prevention and elimination of pollution. It applies to any discharge of a pollutant into waters of the United States.

Section 401: Section 401 of the CWA requires a water quality certification from the State Board or Regional Board when a project (1) requires a federal license or permit (a Section 404 permit is the most common federal permit for Caltrans projects) and (2) will result in a discharge to waters of the United States. Section 401 water quality certifications apply to the construction and subsequent operation of a facility.

Section 402: This section of the CWA establishes a permitting system for the discharge of any pollutant (except dredge or fill material) into waters of the United States. A National Pollutant Discharge Elimination System permit is required for all point discharges of pollutants to surface waters. A point source is a discernible, confined, and discrete conveyance, such as a pipe, ditch, or channel. Permits (National Pollutant Discharge Elimination System permit) for all other discharges are obtained from the United States Environmental Protection Agency or appropriate state agency, which in most cases is the appropriate Regional Water Quality Control Board (Section 402).

Section 404: Section 404 of the CWA establishes a permit program administered by USACE, regulating the discharge of dredged or fill material into waters of the United States (including wetlands). Section 404 guidelines allow the discharge of dredged or fill material into the aquatic system only if no practicable alternatives would have less adverse impacts. This coordination is conducted through consultation with USACE.

Endangered Species Act of 1973

FESA and its subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 7: This section requires federal agencies to ensure that the actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification

of critical habitat for these species. USFWS and National Marine Fisheries Service (NMFS) share responsibilities for administering the Act. Section 7 allows for incidental take of a listed species for activities funded or carried out by federal agencies if the take is incidental to, and not the purpose of, an otherwise lawful activity.

Section 9: This section lists those actions that are prohibited under FESA. The take of a species listed in accordance with the act is prohibited. Two processes (Section 7 and Section 10) allow a take when it is incidental to an otherwise legal activity.

Section 10: This section provides a means whereby a nonfederal action with a potential take of a listed species could be allowed under an incidental take permit.

California Endangered Species Act

The California Endangered Species Act (CESA) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy.

No state agency consultation procedures are provided under CESA; however, projects that might result in a take of a state-listed species require a permit from CDFW. For projects that affect both a state- and federally listed species, compliance with FESA may satisfy CESA if CDFW determines that the federal incidental take authorization is consistent with CESA. For projects that will result in a take of a state-only listed species, Caltrans must apply for an incidental take permit under Fish and Game Code Section 2081(b).

Fish and Wildlife Connectivity

With the passage of California Senate Bill 857 in 2005, Caltrans must provide for the unimpeded passage of anadromous fish (fish that are born in freshwater, migrate to the ocean to mature, and return to freshwater to spawn). Additionally, Appendix G (Environmental Checklist) of the CEQA Guidelines, require that projects be evaluated for their potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species. Damage repair projects that include existing stream or river crossings must incorporate into the design the remediation of conditions that impede fish passage. Designers and PDTs should work with the Caltrans District Fish Passage Coordinator to review fish passage barrier locations.

Resource information is available online (CalFish 2022). Design guidance can be found in the Caltrans (2007) publication, *Fish Passage Design for Road Crossings*.

Repair projects will include, where appropriate, safe crossings for terrestrial and aquatic wildlife and other accommodations to promote biodiversity and avoid or mitigate harm to individual animals, the fragmentation of plant and animal habitats, and the disruption of natural systems.

Section 4(F)

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at United States Code, Title 49, Section 303, declares that “[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that “[t]he Secretary [of Transportation] may approve a transportation program or project...requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if –

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Departments of Agriculture and Housing and Urban Development in developing transportation projects and programs that use lands protected by Section 4(f).

In general, a Section 4(f) “use” occurs with a Department of Transportation-approved project or program when the following criteria are met: (1) Section 4(f) land is permanently incorporated into a transportation facility; (2) a temporary occupancy of Section 4(f) land is adverse in terms of the Section 4(f) preservationist purposes, as determined by specified criteria (Code of Federal Regulations Title 23, Section 771.135[p][7]); and (3) Section 4(f) land is not incorporated into the

transportation project, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (constructive use) (Code of Federal Regulations Title 23, Sections 771.135[p][1] and [2]).

California State Concurrent Resolution 17 – Relative to Oak Woodlands (1989)

This resolution requires that state agencies undertake in the performance of their duties to preserve and protect native oak trees to the greatest degree feasible, or provide for replacement plantings where blue, Englemann, valley, or coast live oak trees are removed.

Three Feet for Safety Act

On September 16, 2014, AB 1371, known as the Three Feet for Safety Act, went into effect in California. This act is designed to reduce car-bicycle crashes by reminding drivers to give bicyclists more safe space when passing. The California Vehicle Code was amended, requiring drivers to give people riding a bicycle at least 3 feet of clearance when passing in the same direction. If the street width doesn’t allow for that, the driver is required to slow down to a “reasonable and prudent” speed, and may pass “only when doing so would not endanger the safety of the operator of the bicycle, taking into account the size and speed of the motor vehicle and bicycle, traffic conditions, weather, visibility, and surface and width of the highway.”

This policy confirms the need to provide, where feasible and where the speed differential between bicyclists and motorist is expected to be significant, roadway widths adequate for motorists to safely pass bicyclists.

Caltrans Standards and Directives

Many internal Caltrans standards and directives will also apply to these projects. An overview of these follows.

Design Standards

Caltrans designs roadways in accordance with the HDM. For example, the HDM calls for new roadways to have a 40-foot-wide roadway section (width), consisting of two 12-foot-wide lanes (one in each direction) with 8-foot-wide paved shoulders on conventional highways. See Section 5.2.6 for additional information on travel lanes and shoulders in San Mateo County. A design exception is required for any project intending to install a section that is less than 40 feet wide.

There are many good reasons to seek out a narrower roadway section, and Caltrans has done so on numerous occasions when working in the Coastal Zone, particularly in Marin and Sonoma counties. Such reasons include avoiding impacts to archaeological resources, sensitive biological resources, and visual resources; topographical and right-of-way constraints; conflicts with context sensitivity and regulatory policy; and excessive costs. Narrower roadway widths must strike a balance between user safety and resource protection. Authorizations under the Coastal Act and numerous specific LCP policies typically limit SR 1 lane expansions and require roadway shoulders less than 8 feet that seek to balance bicycle safety improvements with visual and contextual issues along Highway 1. In addition to the HDM’s standards, many more guidelines have been developed to help design and provide mobility and safety for all users of state facilities. For additional standards, see Caltrans Design Information Bulletin (DIB) 79-04 (Caltrans 2019). This bulletin, currently in its fourth edition, supplements the HDM and provides standards for most damage repair projects.

Context Sensitive Solutions

In November 2001, Caltrans adopted a policy, Director’s Policy 22 (Caltrans 2001), stating that all approaches toward planning, designing, constructing, maintaining, and operating the Caltrans system should look for “Context Sensitive Solutions.” This means that transportation decision making should be inclusive, considering and integrating aesthetic, historic, and environmental values into the process of project delivery. The policy recognizes that highways are more than just the paved roadway—they are corridors that support communities’ economic, aesthetic, cultural, and social needs. The Context Sensitive Solutions policy asks staff to reach resolutions through a collaborative interdisciplinary approach involving all stakeholders. For example, Caltrans staff should coordinate with State Parks staff for projects bordering a state park. The CCC; County of San Mateo; and cities of Half Moon Bay, Pacifica, and Daly City should be included for projects in, or affecting the resources of, the Coastal Zone in which they hold jurisdiction.

Main Street: Flexibility in Design and Operations

Main Street: California: A Guide for Improving Community and Transportation Vitality (Caltrans 2013) is a planning reference booklet and compilation of options that can enhance established traffic engineering and design practices in the implementation of Deputy Directive 64. Although the ideas and practices in this report do not supersede existing Caltrans’ manuals, the suggestions support existing multimodal policies and standards, offering stakeholder engagement and traffic-calming practices for projects focused on main streets in communities.

Climate Change Policy

On June 22, 2012, Caltrans issued Director's Policy 30 on Climate Change (Caltrans 2012). Director's Policy 30 directs the coordination of climate change mitigation and adaptation across all Caltrans programs to include design and construction of transportation infrastructure; support climate-change-related research; and ensure that adequate resources are allocated toward project-level climate-change-related studies, and further development, coordination, and implementation of Caltrans' Climate Change policy.

Along with project-specific needs, climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. California's Fourth Climate Change Assessment (State of California 2018) includes language used widely in climate change analysis and policy documents. Additionally, several key state laws and executive orders have guided climate change adaptation efforts to date.

Caltrans' adaptation efforts include vulnerability assessments, which are tailored to the practices of a transportation agency, and involve the following concepts and actions:

- **Exposure** – Identify Caltrans assets exposed to damage or reduced service life from expected future conditions.
- **Consequence** – Determine what might occur to system assets in terms of loss of use or costs of repair.
- **Prioritization** – Develop a method for making capital programming decisions to address identified risks, including considerations of system use and/or timing of expected exposure.

The findings of Caltrans' vulnerability assessments will guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and provide and maintain transportation that meets the needs of all Californians.

Appendix B CCC Coastal Development Permit Exemption Worksheet

COASTAL DEVELOPMENT PERMITTING (CDP) JURISDICTION

- Coastal Commission
- Local Government LCPs (list LCPs
_____)
- Joint Coastal Commission and Local Government LCP (list LCPs
_____)

PROJECT DESCRIPTION (attach relevant layouts/plans and extra sheets as needed)

Only the following project types may be exempt or excluded. Please identify which category applies (check all that apply):

- Repair or maintenance of an existing public road including landscaping, signalization, lighting, signing, resurfacing, retaining walls, safety barriers and railings and other comparable development within the existing right of way
- Maintenance activities generally necessary to preserve the highway facility as it was constructed, including: construction of temporary detours; removal of slides and slip cuts; restoration and repair of drainage and slope protection devices; installation of minor drainage devices to help preserve the roadway or adjacent properties; restoration, repair and modification of bridges and other highway structures for public safety; and restoration of pavement and base to original condition by replacement, resurfacing, or pavement grooving.

For more information on this form and the CDP exemption determination process, please refer to the most recent Coastal Project Exemption Worksheet Instructions. Please note that applications for projects that are located solely within a local government's CDP jurisdiction must be processed through local planning departments rather than the Coastal Commission district offices. If the project is an

emergency, please do not use this worksheet but instead follow the emergency CDP procedures process.

STEP 1: Does the project include ANY of the following?

- Physical enlargement or expansion of existing facilities (e.g., expanded roads or pavement, expanded shoulders, additional lanes (including adding more lanes as a result of striping changes without widening pavement), etc.)
- Development that is located outside of the existing right of way
- Grading outside of the roadway prism
- Disposal of materials in the coastal zone, other than conventional disposal at an appropriately licensed and permitted disposal facility (e.g., landfills, corporation yards, etc.)

If **any** of the boxes are checked, go to Step 4.

If **none** of the boxes are checked, go to Step 2.

STEP 2: If the project includes ANY of the following, it may not be exempt/excluded.

- The potential for impacts to public access (e.g., trails, overlooks, parking, bike lanes, beaches, parks, or other coastal access points)
- The potential for impacts to environmentally sensitive habitat areas (ESHA) (e.g., areas with sensitive species, habitats, or communities, including state-ranked rare (S1-S3) vegetation types)
- The potential for impacts to coastal wetlands, waters, and marine resources
- The potential for impacts to public views or other visual resources

If **any** of the boxes are checked, go to Step 3.

If **none** of the boxes are checked, go to Step 5.

STEP 3: Exemption/Exclusion Confirmation Process:

Please consult with the Caltrans coastal liaison for further clarification. Even if one or more boxes in Step 2 are checked, the project still may qualify for an exclusion/exemption if certain BMPs and/or avoidance/minimization measures are

incorporated into the project design. If the project is not exempt or excluded, the project may qualify for streamlined processing (e.g., CDP waiver) if it is located within or partially within the Coastal Commission's retained CDP jurisdiction (including through an agreed upon consolidated CDP application). Other streamlined options also may be available.

STEP 4: The project is NOT exempt/excluded.

The project is not exempt or excluded and a CDP application is required. The project may still qualify for streamlined processing (e.g., CDP waiver) if it is located within or partially within the Coastal Commission's retained CDP jurisdiction (including through an agreed upon consolidated CDP application). Please consult with the Caltrans coastal liaison for permit processing questions.

STEP 5: The project is exempt/excluded.

The project is exempt/excluded. Please file exemption/exclusion paperwork in project file and with Caltrans coastal liaison, and confirm with Coastal Commission staff.

Appendix C Highway Design Manual Topics

Topic 81 – Project Development Overview

Index 81.1 – Philosophy

The project development process seeks to provide a degree of mobility to users of the transportation system that is in balance with other values. In the development of transportation projects, social, economic, and environmental effects must be considered fully along with technical issues so that final decisions are made in the best overall public interest. Attention should be given to such considerations as the following:

- (a) Need to provide transportation for all users (motorists, bicyclists, transit riders, and pedestrians) of the facility and transportation modes.
- (b) Attainment of community goals and objectives
- (c) Needs of people with mobility issues, disabilities, or those who are disadvantaged
- (d) Costs of eliminating or minimizing adverse effects on natural resources, environmental values, public services, aesthetic values, and community and individual integrity
- (e) Planning based on realistic financial estimates
- (f) The cost, ease, and safety of maintaining whatever is built

Proper consideration of these items requires that a facility be viewed from the perspectives of the user, the nearby community, and larger statewide interests. For the user, efficient travel and safety are paramount concerns. At the same time, the community often is more concerned about local aesthetic, social, and economic impacts. The general population, however, tends to be interested in how successfully a project functions as part of the overall transportation system and how large a share of available capital resources it consumes. Therefore, individual projects must be selected for construction based on overall system benefits as well as community goals, plans, and values.

Decisions must also emphasize different transportation modes working together effectively.

The goal is to provide a safe, sustainable, integrated and efficient transportation system in a manner that is compatible with, or which enhances, adjacent community values and plans.

*More information on flexibility in design and developing projects that enhance livability is available online.*¹⁰

Topic 109 – Scenic Values in Planning and Design

109.1 Basic Precepts

For any highway, having a pleasing appearance is an important consideration. Scenic values must be considered along with safety, utility, economy, and all the other factors considered in planning and design. This is particularly true of the many portions of the State Highway System situated in areas of natural beauty. The location of the highway, its alignment and profile, its cross section, and other features should be in harmony with the setting.

109.2 Design Speed

The design speed should be carefully chosen, as it is the key element that establishes standards for the horizontal alignment and profile of the highway. These requirements in turn directly influence how well the highway blends into the landscape. Scenic values, particularly in areas of natural scenic beauty must play a part along with the other factors set forth under Index 101.1 in selecting a design speed.

109.3 Aesthetic Factors

Throughout planning and design, consider the following:

- (a) The location of the highway should be such that the new construction will preserve the natural environment and will lead to and unfold scenic positions. In some cases, additional minor grading not required for roadbed alignment may expose an attractive view or hide an unsightly one.
- (b) The general alignment and profile of the highway should fit the character of the area traversed so that unsightly scars of excavation and embankment will be held

¹⁰ Available online at: <http://www.dot.ca.gov/hq/oppd/design/2014-4-2-Flexibility-in-Design.pdf> and http://www.dot.ca.gov/hq/projdev/pdq/2015_PDQ_Winter.pdf.

to a minimum. Curvilinear horizontal alignment should be coordinated with vertical curvature to achieve a pleasing appearance.

- (c) Existing vegetation (e.g., trees, native forbs and grasses) should be preserved and protected to the maximum extent feasible during the planning, design, and construction of transportation projects. Whenever mature trees are present, especially in forested areas, a tree survey should be conducted to provide an in-depth inventory of tree height, canopy cover, and tree vigor, and assess the number of trees that could be affected by a project.
- (d) Appropriate replacement planting should be provided when existing planting is removed. When native or specimen trees are removed, replacement planting should reflect the visual importance of the plantings lost. Where the visual impact of tree removal is substantial, replacement with large transplants may be appropriate. If not, an appropriate quantity of smaller replacements may be required to ensure eventual survival of an adequate number of plants.

Provisions for watering and establishment of replacement planting should also be considered. The District Landscape Architect should be consulted early in the planning and design process so that appropriate conservation and revegetation measures are incorporated.

- (e) Existing vegetation such as trees or large brush may be selectively thinned or removed to open up scenic vistas or provide a natural looking boundary between forested and cleared areas. Vegetation removal for aesthetic purposes should be undertaken only with the concurrence of the District Landscape Architect.
- (f) Vista points should be provided when views and scenery of outstanding merit occur, and feasible sites can be found (see Topic 904 for site selection criteria).
- (g) Whenever feasible, wide medians and independent roadways should be provided on multilane facilities as these features add scenic interest and relieve the monotony of parallel roadways.
- (h) Bridges, tunnels, and walls merit consideration in lieu of prominent excavation and embankment slopes when costs of such alternates are not excessive.
- (i) Slopes should be flattened and rounded whenever practical and vegetation provided so that lines of construction are softened.

- (j) Structures should be located and designed to give the most pleasing appearance.
- (k) Scars from material sites should be avoided. Planting compatible with the surroundings should be undertaken to revegetate such scars when they are unavoidable.
- (l) Drainage appurtenances should be so located that erosion, sumps, and debris collection areas are hidden from view or eliminated when site conditions permit.
- (m) Interchange areas should be graded as flat as reasonable with slope rounding and contouring to provide graceful, natural looking appearance. The appearance can be further enhanced by planting a vegetative cover appropriate to the locality, being careful to maintain driver visibility.
- (n) In locations where graffiti has been excessive, concepts such as limiting accessibility, planting, and surface treatments should be considered to deter graffiti.
- (o) Roadsides should be designed to deter weed growth along the traveled way, and to provide for mechanical litter collection.

Appendix D Bicycle and Pedestrian Needs and Projects

Table D-1 Bicycle and Pedestrian Projects Along State Route 1 in San Mateo County¹¹

Location(s)	Description	Source
PM 27.81/31.01. City of Half Moon Bay – Roosevelt Boulevard to Higgins Road	Proposed project to install a Class I bicycle path facility on SR 1	Caltrans District 4 Bike Plan
PM 30.92. City of Half Moon Bay – State Route 92 to Wavecrest Road	Proposed project to install complete Class I bicycle paths	Caltrans District 4 Bike Plan
PM 37.97/38.47. Unincorporated San Mateo County – Gray Whale Cove Parking Area to Devil’s Slide trail	Proposed project to provide a Class I bicycle path connection from Gray Whale Cove to Devil’s Slide Trail along SR 1	Caltrans District 4 Bike Plan
PM 40/40.71. City of Pacifica – San Pedro Avenue to Devil’s Slide Trail	Proposed project to provide a Class I bicycle path connection from Pacifica to the Devil’s Slide Trail along SR 1, or other options	Caltrans District 4 Bike Plan
PM 34.92/37.97. Montara, Half Moon Bay – Gray Whale Cove to Half Moon Bay Airport	Proposed project to provide a Class I bicycle path along SR 1	Caltrans District 4 Bike Plan
PM 23.62/23.62. San Gregorio – Cowell-Purisima Trail to San Gregorio Beach parking lot	Proposed project to provide a Class I bicycle path connection	Caltrans District 4 Bike Plan
PM 26.17/26.67. City of Half Moon Bay – Wavecrest Road to Dehoff Canyon Road	Proposed project to provide complete Class I bicycle paths on both sides of SR 1, from Wavecrest Road to the Half Moon Bay city limits (just north of Dehoff Canyon Road)	Caltrans District 4 Bike Plan
PM 43.51. Pacifica – Sharp Park Road	Proposed project to improve crossing at the Sharp Park Road/SR 1 intersection	Caltrans District 4 Bike Plan

¹¹ This list is based off of existing bicycle and pedestrian plans and is current as of 2023.

Location(s)	Description	Source
PM 44.94. Pacifica – Palmetto Avenue	Proposed project to install a Class II bicycle lane on Palmetto Avenue between Avalon Drive and Westline Drive	Caltrans District 4 Bike Plan
PM 28.82. Half Moon Bay – Kelly Avenue	Proposed project to improve crossing at the Kelly Avenue/SR 1 intersection	Caltrans District 4 Bike Plan
PM 28.29. Half Moon Bay – Poplar Street	Proposed project to improve crossing at the Poplar Street/SR 1 intersection	Caltrans District 4 Bike Plan
PM 32.95. El Granada – Capistrano Road	Proposed project to install a Class III bicycle route on Capistrano Road between Prospect Way and SR 1; this project would also improve the crossing at the Capistrano Road/SR 1 intersection	Caltrans District 4 Bike Plan
PM 29.02. Half Moon Bay – State Route 92	Proposed project to improve crossing at the State Route 92/SR 1 intersection	Caltrans District 4 Bike Plan
PM 35.94. Moss Beach – Carlos Street	Proposed project to install Class II bicycle lanes on Carlos Street from SR 1 to Vermont Avenue	Caltrans District 4 Bike Plan
PM 33.45. Moss Beach, El Granada – Capistrano Road	Proposed project to improve crossing at the Capistrano Road/SR 1 intersection; this project would also consider closing or reconfiguring the free right-turn lane	Caltrans District 4 Bike Plan
PM 32.09. El Granada – Coronado Street	Proposed project to improve crossing at the Coronado Street/SR 1 intersection	Caltrans District 4 Bike Plan
PM 35.06. Moss Beach – Cypress Avenue	Proposed project to improve crossing at the Cypress Avenue/SR 1 intersection	Caltrans District 4 Bike Plan
PM 33.91. Moss Beach – Half Moon Bay Airport	Proposed project to improve crossing at the Half Moon Bay Airport/SR 1 intersection	Caltrans District 4 Bike Plan
PM 31.27. El Granada – Mirada Road	Proposed project to improve crossing at the Mirada Road/SR 1 intersection	Caltrans District 4 Bike Plan
PM 27.81. Half Moon Bay – Higgins Canyon Road	Proposed project to improve crossing at the Higgins Canyon Road/SR 1 intersection; this project would include striping bicycle facilities and improving pedestrian crossing	Caltrans District 4 Bike Plan

Location(s)	Description	Source
PM 37.95. Unincorporated – Gray Whale Cove	Proposed project to provide a flashing beacon, pedestrian hybrid beacon, or other improvement along SR 1 at Gray Whale Cove Beach parking lot to connect to Gray Whale Cove State Beach; this would be a primarily pedestrian focused crossing	Caltrans District 4 Bike Plan
PM 36.68. Montara – 2nd Street	Proposed project to provide flashing beacons or other advance warning for bicyclists crossing SR 1 at 2nd Street in Montara	Caltrans District 4 Bike Plan
PM 36.44. Montara – 7th Street	Proposed project to provide flashing beacons or other advance warning for bicyclists crossing SR 1 at 7th Street in Montara	Caltrans District 4 Bike Plan
PM 35.27. Moss Beach – Virginia Avenue	Proposed project to provide a pedestrian hybrid beacon or flashing beacons for an improved bicycle and pedestrian crossing, potentially at the Virginia Avenue/SR 1 intersection; the exact location is to be determined	Caltrans District 4 Bike Plan
City of Pacifica, Unincorporated – SR 1 from San Pedro Terrace Road to Devil’s Slide Trail	Proposed project to provide a new Class II bicycle lane	C/CAG Comprehensive Bicycle and Pedestrian Plan
PM 31.19/36.63. Unincorporated – SR 1 from 1st Street to Mirada Road	Proposed project to provide a new Class II bicycle lane	C/CAG Comprehensive Bicycle and Pedestrian Plan
Unincorporated – Pescadero Creek Road from SR 1 to Stage Road	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan
Half Moon Bay – State Route 92 from SR 1 to Hilltop Mobile Home Park Road	Proposed project to provide a new Class IV separated bikeway	C/CAG Comprehensive Bicycle and Pedestrian Plan
Unincorporated – Carlos Street, Vermont Avenue	Proposed project to construct bicycle improvements adjacent to Carlos Street/Vermont Avenue/SR 1	C/CAG Comprehensive Bicycle and Pedestrian Plan
PM 42.02/43.08. Pacifica – SR 1 to Westport Drive	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan
PM 36.63/38.49. Montara, Unincorporated – SR 1 from Devil’s Slide Trail to 1st Street	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan

Location(s)	Description	Source
Unincorporated – Bay to Sea Trail from Bay to Sea Trail Mountain Segment to SR 1	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan
Pacifica, Unincorporated – SR 1 adjacent to Devil’s Slide Trail	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan
PM 26.43/36.13. El Granada, Half Moon Bay, Montara, Moss Beach, Unincorporated – SR 1 from 11th Street to Miramontes Point Road	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan
PM 0.0/26.43. Half Moon Bay, Unincorporated – SR 1 from San Mateo/Santa Cruz county line to Miramontes Point Road	Proposed project to provide a new Class I bicycle path	C/CAG Comprehensive Bicycle and Pedestrian Plan
Various	Proposed project: SR 1 Side Street Stop Signs; this project would install stop signs and pavement markings at all side streets of SR 1 where missing	Connect the Coastside
Montara	Proposed project: Main Street Traffic Calming and Bicycle/Pedestrian Connectivity; this project would provide pedestrian access, traffic-calming and bicycle improvements in Central Montara between 7th and 11th Streets, including: curb extensions, sidewalks, marked crossings, mini traffic circle, and a bicycle route	Connect the Coastside
Moss Beach	Proposed project: Carlos Street Traffic Calming; this project would provide striping, signage, and completion of a missing sidewalk, with conversion to one-way southbound with parking reoriented facing south on Carlos Street to accommodate the Parallel Trail and calm traffic in central Moss Beach	Connect the Coastside
State Route 92	Proposed project: Highway 92/Highway 35 (East, Lower) Intersection Improvements; this project would provide intersection improvements to facilitate pedestrian and bicycle crossings and improve signal timing	Connect the Coastside

Location(s)	Description	Source
State Route 92	Proposed project: Highway 92/Highway 35 (West, Upper) Intersection Control; this project would provide traffic signal and crossing improvements to facilitate connections for trail users and turning movements for motorists	Connect the Coastside
Various	Proposed Project: New and Improved Crossings of Highways 1 and 92; this project would improve existing and add new pedestrian crossings on Highways 1 and 92; this would include marked crossings with flashing beacons; improvements to the overcrossing of SR 1/south of Carlos Street; and improvements to the intersection of SR 1/Coronado Street	Connect the Coastside
Various	Proposed project: SR 1 Multimodal Parallel Trail; this project would provide connected walking and bicycling facilities along the east side of SR 1 through a connected Class I bicycle path, sidewalks, and Class III bicycle route, with marked crossings of intersecting streets with the path	Connect the Coastside
Various	Proposed project: Midcoast Alignment Completion of California Coastal Trail; recommended California Coastal Trail alignment and improvements in the Midcoast including wayfinding signage, a Class I bicycle path, Class III bicycle route, trails, and paths	Connect the Coastside
Montara, Moss Beach	Proposed Project: SR 1 Sidewalks in Moss Beach and Montara; this project would add sidewalks in central Montara and Moss Beach in front of businesses located on SR 1 and marked crossings of side streets that intersect SR 1	Connect the Coastside
Moss Beach	Proposed project: Central Moss Beach Bicycle and Pedestrian Improvements; this project would add sidewalks on where missing on the western side of Etheldore Street (north of California Avenue) and California Avenue (south of Etheldore Street) to connect to existing sidewalks and add a Class III bicycle route on California Avenue from Etheldore Street to SR 1	Connect the Coastside
Montara	Proposed project: Montara Safe Routes to School; various improvements to make it easier to walk and bicycle to Farallone View Elementary School, including sidewalks, Class III bicycle routes, improved crossings, and stop signs	Connect the Coastside

Location(s)	Description	Source
El Granada	Proposed project: El Granada Safe Routes to School; various improvements to make it easier to walk and bicycle to El Granada Elementary School and the Wilkinson School, including sidewalks, Class III bicycle routes, traffic calming, and improved crossings	Connect the Coastside
El Granada, Princeton	Proposed project: Capistrano Road (South) Intersection Improvements; this project would improve an intersection for pedestrian access including high visibility crosswalks, refuge islands and guide signs	Connect the Coastside
Various	Proposed project: SR 1 Bikeway; bikeway designation on SR 1 of Class II bicycle lanes	Connect the Coastside
Princeton	Proposed project: Airport Street Bikeway and Princeton Connections; this project would provide bicycle and pedestrian connections from Moss Beach to Princeton via Cypress Avenue and Airport Street	Connect the Coastside
Princeton	Proposed project: Capistrano Road Bikeway; bikeway designations on Capistrano Road, including a Class III bicycle route with paved shoulders, a Class III bicycle route with sharrows, and Class II bicycle lanes	Connect the Coastside
Various	Proposed project: Bicycle Parking; this project would install short-term bicycle parking at key destinations throughout the Midcoast	Connect the Coastside
Various	Proposed project: Transit Stop Improvements; this project would ensure all bus stops have Americans with Disabilities Act accessible pads, with additional amenities at higher use stations including benches, shelters, and lighting	Connect the Coastside
PM 26.0/27.56. Wavecrest Road to Half Moon Bay City Limits	Proposed Class I bicycle path (Naomi Partridge Trail extension)	Half Moon Bay Bicycle and Pedestrian Master Plan
PM 28.74/29.03. Heskin Avenue to Kelly Avenue.	Proposed Class I bicycle path (Naomi Partridge Trail gap closure)	Half Moon Bay Bicycle and Pedestrian Master Plan
PM 30.34/31.81. Ruisseau Francais Avenue to HMB City Limits.	Proposed Class I bicycle path (Naomi Partridge Trail extension)	Half Moon Bay Bicycle and Pedestrian Master Plan

Location(s)	Description	Source
PM 28.95. Pilarcitos Creek Undercrossing	Proposed project to improve lighting, clean up vegetation and debris	Half Moon Bay Bicycle and Pedestrian Master Plan
PM 29.04. State Route 92	Proposed crossing improvement: high-visibility crosswalks, protected intersection	Half Moon Bay Bicycle and Pedestrian Master Plan
Grandview Boulevard, Mirada Road, Redondo Beach Road, Roosevelt Boulevard, Filbert Street, Spindrift Way, Seymour Street intersections	Proposed crossing improvement: Pedestrian hybrid beacon or activated flashing beacon	Half Moon Bay Bicycle and Pedestrian Master Plan
PM 39.6/42.9. Mori Point Road to Devil's Slide Trail	Proposed Class I bicycle path	Pacifica Bicycle and Pedestrian Master Plan
PM 40.95. Linda Mar Boulevard/San Pedro Avenue	Proposed project to reconfigure the crosswalks to create more direct beach access, reducing unnecessary crossing stages; additionally, add curb extensions and a pedestrian refuge island	Pacifica Bicycle and Pedestrian Master Plan
PM 41.27. Crespi Drive	Proposed project to improve crossings with refreshed pavement markings and curb extensions; widen the sidewalk on the northern side of SR 1 between Ladera Way and SR 1; extend the physical barrier south from existing k-rails to the intersection; consider decorating the k-rails for placemaking	Pacifica Bicycle and Pedestrian Master Plan
PM 41.9. Sea Bowl Lane	Proposed project to improve crossing of Sea Bowl Lane	Pacifica Bicycle and Pedestrian Master Plan
PM 42.13. Rockaway Beach Avenue/Fassler Avenue	Proposed project to Improve crossings of SR 1 with high visibility crosswalks and curb extensions; construct sidewalks on the western side of SR 1 between Rockaway Beach and the SamTrans bus stop, and between Fassler Avenue and Sea Bowl Lane on the eastern side; work with Caltrans to remove slip lane from Rockaway Beach approach; work with Caltrans to study signal modifications to improve pedestrian conditions, including leading pedestrian intervals and actuated no right turns on red; mark the eastern approach of the intersection across SR 1	Pacifica Bicycle and Pedestrian Master Plan
PM 42.59. Reina Del Mar intersection	Proposed project to enhance pedestrian crossings, Calera Creek Trail access, and SamTrans access with crosswalk improvements, pedestrian refuge islands, and widened sidewalks	Pacifica Bicycle and Pedestrian Master Plan

Location(s)	Description	Source
PM 43.08. Westport Drive.	Proposed project to improve the crossing of SR 1 by installing a Pedestrian Hybrid Beacon, curb extensions, median refuge island, lighting, and improved sidewalk connections around the crossing, or look to remove crosswalks all together while encouraging pedestrian undercrossing improvements to the north at the Fairway Drive pedestrian tunnel	Pacifica Bicycle and Pedestrian Master Plan
PM 43.13. Fairway Drive pedestrian tunnel	Proposed project to repair/build sidewalks and curb ramps around the tunnel; install lighting and repaint the tunnel; add wayfinding directing people to the tunnel	Pacifica Bicycle and Pedestrian Master Plan
PM 44.87. Milagra Drive Pedestrian Overcrossing	Proposed project to improve crossing conditions and SamTrans access with additional pavement markings and a pedestrian actuated flashing beacon; the Palmetto Avenue SR 1 ramp and crosswalk should be reconfigured to improve pedestrian safety	Pacifica Bicycle and Pedestrian Master Plan
PM 0.0/26.43. Miramontes Point Rd to Santa Cruz County border	Proposed Class I bicycle path with shared use	Unincorporated San Mateo County Active Transportation Plan
PM 31.19/38.49. Mirada Road to Devil's Slide Trail	Proposed Class I bicycle path with shared use	Unincorporated San Mateo County Active Transportation Plan
PM 31.19/38.49. Mirada Road to Devil's Slide Trail	Proposed Class II bicycle lanes	Unincorporated San Mateo County Active Transportation Plan
PM 36.29, 36.34. 7th Street and 8th Street Intersections.	Proposed project to install marked crosswalks across 7th Street and 8th Street at SR 1 and Install curb ramps with detectable warning surfaces at ends of marked crosswalks	Unincorporated San Mateo County Active Transportation Plan
PM 47.1. Serramonte Boulevard on- and off-ramps.	Proposed pedestrian and bicycle improvements at ramp termini	Walk Bike Daly City

Notes:

- Caltrans = California Department of Transportation
- C/CAG = City/County Association of Governments of San Mateo County
- HMB = Half Moon Bay
- SR 1 = California State Route 1
- PM = post mile

Table D-2 Bicycle and Pedestrian Needs Along State Route 1 in San Mateo County

Location(s)	Description	Source
PM 40.7/43.1. San Pedro Avenue to Westport Drive	Pedestrian corridor need	District 4 Pedestrian Plan
PM 18.089. San Gregorio State Beach	Pedestrian crossing need	District 4 Pedestrian Plan
PM 18.189. La Honda Road	Pedestrian crossing need	District 4 Pedestrian Plan
PM 20.98. Tunitas Creek Road	Pedestrian crossing need	District 4 Pedestrian Plan
PM 22.341. Martins Beach Road	Pedestrian crossing need	District 4 Pedestrian Plan
PM 26.432. Miramontes Point Road	Pedestrian crossing need	District 4 Pedestrian Plan
PM 26.667. Fairway Drive	Pedestrian crossing need	District 4 Pedestrian Plan
PM 27.75. Higgins Canyon Road	Intersection improvement at controlled intersection	District 4 Pedestrian Plan
PM 28.008. Seymour Street	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 28.22. Poplar Street	Intersection improvement at controlled intersection	District 4 Pedestrian Plan
PM 28.354. Filbert Street	Pedestrian crossing need	District 4 Pedestrian Plan
PM 28.776. Kelly Avenue	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 29.04. State Route 92	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 29.35. Grand Boulevard/Silver Avenue	Pedestrian crossing need	District 4 Pedestrian Plan
PM 29.948. Spindrift Way	Pedestrian crossing need	District 4 Pedestrian Plan
PM 30.222. Frenchman's Creek Road	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 30.6. Young Avenue	Pedestrian crossing need	District 4 Pedestrian Plan
PM 30.948. Roosevelt Boulevard	Pedestrian crossing need	District 4 Pedestrian Plan
PM 31.199. Mirada Road	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 31.416. Medio Avenue	Pedestrian crossing need	District 4 Pedestrian Plan
PM 32.023. Coronado Street	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 32.86. Capistrano Road (South)	Pedestrian crossing need	District 4 Pedestrian Plan

Location(s)	Description	Source
PM 33.376. Capistrano Road (North)	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 33.897 Half Moon Bay Airport Entrance	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 34.965. Cypress Avenue	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 35.23. Etheldore Street/Vallemar Street	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 35.878 16th Street	Pedestrian crossing need	District 4 Pedestrian Plan
PM 36.338. 7th Street	Pedestrian crossing need	District 4 Pedestrian Plan
PM 36.582. 2nd Street	Pedestrian crossing need	District 4 Pedestrian Plan
PM 38.493. Devil's Slide Trail (South)	Pedestrian crossing need	District 4 Pedestrian Plan
PM 39.574. Devil's Slide Trail (North)	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 42.13. Rockaway Beach Avenue/Fassler Avenue	Pedestrian crossing need	District 4 Pedestrian Plan
PM 42.922. Mori Point Road	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 43.08. Westport Drive	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan
PM 46.13. Arcadia Drive	Bicycle and/or pedestrian crossing need	District 4 Pedestrian Plan

Notes:

SR 1 = California State Route 1

PM = post mile

Appendix E Glossary and Abbreviations

Glossary

Complete Streets: A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including pedestrians, bicyclists, motorists, and transit users, appropriate to the function and context of the facility.

Design Vehicle: From PM 0 to PM 30.8, SR 1 is a Terminal Access Route, which interstate Surface Transportation Assistance Act of 1982 trucks may traverse. From PM 30.8 to PM 40.8, it is designated California Legal Only, with a 65-foot overall length and 40-foot kingpin-to-rear axle restrictions. From PM 38.5 to PM 39.3 – the Tom Lantos Tunnel – there is an R5 special restriction on hazardous materials. In this segment, no explosives (class 1) or flammables/combustibles (class 2.1 and 3) are permitted. From PM 40.8 to PM 48.4 – the San Mateo/San Francisco County Line – SR 1 is once again a Terminal Access Route.

Design Standard Decision Document: A DSDD is required on a project if any element on a project does not meet current HDM standards. The DSDD must justify a deviation from design standards and must be approved prior to the nonstandard feature being constructed.

Roadside: A general term denoting the area adjoining the outer edge of the roadbed to the right-of-way line.

Roadway: That portion of a highway between the outside lines of the sidewalks, or curbs and gutters, or side ditches, including the appertaining structures and all slopes, ditches, channels, waterways, and other features necessary for proper drainage and protection.

Scenic Highway: A state or county highway—in total or in part—that is recognized for its scenic value, is protected by a locally adopted corridor protection program, and has been officially designated by Caltrans.

Shoulder: The portion of the roadway contiguous with the traveled way for the accommodation of stopped vehicles, including emergency services, for errant vehicle recovery, and for lateral support of base and surface courses. The shoulder may accommodate bicyclists and pedestrians, and in towns, it may accommodate parking.

Traveled Way: The portion of the roadway for the movement of vehicles and bicycles, exclusive of shoulders.

List of Abbreviated Terms

AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ADAP	Adaptation Decision-Making Assessment Process
C/CAG	City/County Association of Governments of San Mateo County
Cal OES	Governor’s Office of Emergency Services
Caltrans	California Department of Transportation
CCC	California Coastal Commission
CCT	California Coastal Trail
CDFW	California Department of Fish and Wildlife
CDPs	Coastal Development Permits
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHP	California Highway Patrol
Coastal Act	California Coastal Act
Conservancy	California Coastal Conservancy
CWA	Clean Water Act
DIB	Design Information Bulletin
DSDD	Design Standard Decision Document
EOC	Emergency Operations Center
ESHA	environmentally sensitive habitat area
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
Guidelines	State Route 1 Repair Guidelines
HDM	Highway Design Manual
ICS	Incident Command System
LCP	Local Coastal Program

MASH	Manual for Assessing Safety Hardware
MCC	Midcoast Community Council
MGS	Midwest Guardrail System
mph	mile(s) per hour
NEPA	National Environmental Policy Act
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OES	Office of Emergency Services
OPC	Ocean Protection Council
Parallel Trail	Highway 1 Parallel Trail
PDT	Project Development Team
PIOs	public information officers
PM	post mile
PRC	Public Resources Code
REOC	Region Emergency Operations Center
RM	Resource Management
SEMS	Standardized Emergency Management System
SER	Standard Environmental Reference
SHOPP	State Highway Operations and Protection Program
SOC	State Operations Center
SR	State Route
State Parks	California Department of Parks and Recreation
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service