

Chapter 3 California Environmental Quality Act Evaluation

3.1 Determining Significance under the California Environmental Quality Act

The proposed project is a joint project by Caltrans and the Federal Highway Administration and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act and the National Environmental Policy Act. Caltrans is the lead agency under the California Environmental Quality Act, and the Federal Highway Administration is the lead agency under the National Environmental Policy Act.

One of the primary differences between the National Environmental Policy Act and the California Environmental Quality Act is the way significance is determined. Under the National Environmental Policy Act, significance is used to determine whether an Environmental Impact Statement, or some lower level of documentation, will be required. The National Environmental Policy Act requires that an Environmental Impact Statement be prepared when the proposed federal action (project) *as a whole* has the potential to “significantly affect the quality of the human environment.” The determination of significance is based on context and intensity. Some impacts determined to be significant under the California Environmental Quality Act may not be of sufficient magnitude to be determined significant under the National Environmental Policy Act. Under the National Environmental Policy Act, once a decision is made regarding the need for an Environmental Impact Statement, it is the magnitude of the impact that is evaluated, and no judgment of its individual significance is deemed important for the text. The National Environmental Policy Act does not require that a determination of significant impacts be stated in the environmental documents.

The California Environmental Quality Act, on the other hand, does require Caltrans to identify each “significant effect on the environment” resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an Environmental Impact Report must be prepared. Each and every significant effect on the environment must be disclosed in the Environmental Impact Report and mitigated, if feasible. In addition, the California Environmental Quality Act Guidelines list a number of mandatory findings of significance, which also require the preparation of an Environmental Impact Report. There are no types of actions under the National Environmental Policy Act that parallel the findings of mandatory significance of the California Environmental Quality Act. This chapter discusses the effects of this project and the California Environmental Quality Act significance.

Different standards are applied for analysis of certain impacts. For example, when determining whether a noise impact is significant under the California Environmental Quality Act, the baseline noise level is compared with the build noise level. The California Environmental Quality Act noise analysis is completely independent of the noise analysis in Chapter 2, which is based on regulations pursuant to the National Environmental Policy Act, in 23 Code of Federal Regulations (CFR) 772, which requires a noise analysis that is centered on noise abatement criteria. Under the California Environmental Quality Act, the assessment entails looking at the setting of the noise impact and then how large or perceptible any noise increase would be in the given area. Key considerations include: the uniqueness of the setting, the sensitive nature of the noise receptors, the magnitude of the noise increase, the number of residences affected, and the absolute noise level. As explained in Section 3.2.1, the proposed alternatives would have less than significant noise impacts under the California Environmental Quality Act.

This project has been prepared as a combined Tier I /Tier II Draft Environmental Impact Report/Environmental Assessment. The Tier I portion of the document analyzes at the master plan level (Public Resources Code, Section 21157-21157.6) two alternatives for improvements within an 8.5-mile segment of Route 1 in Santa Cruz County and a No Build Alternative. The Tier II portion analyzes at the project level a build alternative and a No Build Alternative for a specific project within the Tier I corridor. This chapter examines the California Environmental Quality Act significance of both the Tier I and Tier II projects.

3.2 Discussion of Significant Impacts

This section identifies impacts of the proposed project that would be considered potentially significant under the California Environmental Quality Act before proposed mitigation measures are applied. The California Environmental Quality Act Environmental Significance Checklist (see Appendix A) identifies the human, physical, and biological environmental resources that may be affected by the proposed project and evaluates whether these impacts would be potentially significant, less than significant impact with mitigation applied, less than significant impact, or no impact. Evaluations are based upon the California Environmental Quality Act significance criteria as applied to the results of the technical studies performed in support of this environmental document. Impacts are presented separately for the proposed Tier I and Tier II projects.

3.2.1 No Effects of the Proposed Project

As described in the beginning of Chapter 2, as part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered, but no impacts were identified. Consequently, there is no further discussion regarding these issues in this document for either the Tier I or Tier II projects:

- Farmlands
- Timberlands
- Wild and Scenic Rivers
- Parks and Recreation
- Community Impacts – Economics
- Land Use and Planning (Section 2.1.1, Land Use)
- Population and Housing (Section 2.1.2, Growth)

3.2.2 Less than Significant Effects of the Proposed Project

Tier I Corridor Alternatives

Under the California Environmental Quality Act, the Tier I Corridor Alternatives (TSM and HOV Lane Alternatives) would both have a less than significant effect on the following resources and issues:

- Air Quality (Section 2.2.6, Air Quality)
- Geology and Soils (Section 2.2.3, Geology/Soils/Seismic/Topography)
- Hydrology and Water Quality (Section 2.2.1, Hydrology and Floodplain and Section 2.2.2, Water Quality and Stormwater Runoff)
- Noise (Section 2.2.7, Noise)

The determination of a less than significant noise effect with the project is based on the *Noise Study Report for the Santa Cruz Route 1 Project* (2013). Appendix F of the report compares the design year (2035) noise levels with and without the project, the difference between the design year noise levels and the existing/baseline condition, and the difference between the design year noise levels for build alternatives and the design year noise levels for the No-Build Alternative. The traffic noise increases as a result of the project, including the Tier I HOV Alternative and the Tier I TSM Alternative, range from 0 to 10 A-weighted decibels (dBA) and, as shown in Appendix F of the Noise Study Report, there are high baseline levels (in the 65 to 75 dBA range, and higher) throughout the Route 1 project corridor. A 3 dBA increase between existing noise levels and the build alternatives would be barely perceptible to the human ear, and a 12 dBA increase can be considered a substantial noise increase. None of the noise sensitive land uses in the Route 1 project corridor are projected to experience project-related noise increases above 10 dBA.

- Public Services (Section 2.1.4, Utilities and Emergency Services and Section 2.1.3, Community Impacts)
- Transportation/Traffic (Section 2.1.5)
- Utility and Service Systems (Section 2.1.4, Utilities and Emergency Services)

Tier II Auxiliary Lane Alternative

Under the California Environmental Quality Act, the Tier II Auxiliary Lane Alternative would have a less than significant effect on the following resources and issues:

- Air Quality (Section 2.2.6, Air Quality)
- Geology and Soils (Section 2.2.3, Geology/Soils/Seismic/Topography)
- Hydrology and Water Quality (Section 2.2.1, Hydrology and Floodplain and Section 2.2.2, Water Quality and Stormwater Runoff)
- Noise (Section 2.2.7, Noise)

The determination of a less than significant noise effect with the project is based on the *Noise Study Report for the Santa Cruz Route 1 Project* (2013). Appendix F of the report compares the design year (2035) noise levels, with and without the project, the difference between the design year noise levels and the existing/baseline condition, and the difference between the design year noise levels with and without the project. The traffic noise increases as a result of the Tier II Auxiliary Lane Alternative range from 0 to 8 dBA and, as shown in Appendix F of the Noise Study Report, there are high baseline levels (in the 65 to 70 dBA range, and higher) within the Tier II project limits. A 3-dBA increase between existing noise levels and the build alternative would be barely perceptible to the human ear, and a 12-dBA increase can be considered a substantial noise increase. None of the noise sensitive land uses within the Tier II project limits are projected to experience project-related noise increases above 8 dBA.

- Public Services (Section 2.1.4, Utilities and Emergency Services and Section 2.1.3, Community Impacts)
- Transportation/Traffic (Section 2.1.5)
- Utility and Service Systems (Section 2.1.4, Utilities and Emergency Services)

3.2.3 Significant Environmental Effects of the Proposed Project

Tier I Corridor Alternatives

Under the Tier I Corridor Alternatives, the following potential impacts could rise to the level of significance before mitigation is added:

- Biological Resources/Threatened and Endangered Species – Twenty (20) special-status wildlife species and 34 plant species have the potential to occur within the Biological Study Area. Habitat areas could be temporarily disturbed during construction activities for any of the alternatives. Construction noise and movements of workers could disturb bird nesting or bat roosting. Temporary dewatering/diversion of streams could interrupt passage for fish and amphibians. Removal of mature trees could affect monarch butterfly roosting or bird nesting. Disruption of highway structures could disturb bat roosting. Construction activities for the Tier I Corridor Alternatives have the potential to encroach

upon suitable habitat, interrupt passage, or result in direct take of the following threatened and endangered species: California red-legged frog, tidewater goby, Central California Coast steelhead, Santa Cruz long-toed salamander, white-tailed kite, and tricolored blackbird.

Additionally, the Tier I Corridor Alternatives would result in permanent and temporary impacts to wetlands and other waters, which would be considered significant impacts under the California Environmental Quality Act. See Section 2.3.2, Wetlands and Other Waters and Section 2.4.10, Construction Phase Impacts for a description of the impacts.

The aforementioned impacts to biological resources are potentially significant under the California Environmental Quality Act and are described in Section 2.3.1, Natural Communities; Section 2.3.2, Wetlands and Other Waters; Section 2.3.3, Plant Species; Section 2.3.4, Animal Species; Section 2.3.5, Threatened and Endangered Species; and Section 2.3.6, Invasive Species.

- Cultural Resources (Archaeology) – The Tier I Corridor Alternatives may adversely affect portions of the three unevaluated archaeological sites and their potential buried archaeological deposits within the archaeological Area of Potential Effects, which is considered a potentially significant impact under the California Environmental Quality Act. See Section 2.1.7, Cultural Resources for a description of the impacts.

In addition, potential impacts to unidentified, buried archaeological resources within the Route 1 corridor could occur during project construction, which could result in potentially significant impacts under the California Environmental Quality Act. Measures listed in Section 2.4.7 address the potential discovery of cultural materials and human remains during earthwork.

- Paleontology – The presence of fossils in the Pliocene Purisima Formation, Plio-Pleistocene Aromas Sand, and Pleistocene terrace deposits suggests a high potential for additional similar fossil remains to be uncovered by excavations during project construction. Identifiable fossil remains recovered from any of these stratigraphic units during project construction could be scientifically important and significant, and there is a potential for significant impacts to paleontological resources. Discussion is provided in Section 2.4.8, Paleontology.
- Hazardous Waste/Materials – There is potential for asbestos-containing materials and lead-based paint coatings in structures that would be demolished (including Route 1 bridges, railroad crossings, and commercial or residential structures), and lead-based paint may be present in highway paint striping. Aerially deposited lead may be present in soil areas along the shoulders and median of Route 1, and wooden utility poles within the project footprint that may require removal or relocation may be coated with creosote. In addition, the potential for presence of petroleum projects and heavy metals in soil and groundwater

is identified within the project footprint, associated with several sites meeting the definition of a Recognized Environmental Condition. Impacts from the aforementioned hazardous materials risks are potentially significant under the California Environmental Quality Act and are discussed in Section 2.2.5, Hazardous Waste/Materials and Section 2.4.9, Construction Phase Impacts.

Tier II Auxiliary Lane Alternative

Under the Tier II Auxiliary Lane Alternative, the following potential impacts could rise to the level of significance before mitigation is added:

- Wetlands and Other Waters – The proposed Tier II Auxiliary Lane Alternative would result in permanent and temporary impacts to wetlands and other waters at Rodeo Creek Gulch and at the ditch adjacent to the Soquel Drive-In, which would be considered significant impacts under the California Environmental Quality Act. See Section 2.3.2, Wetlands and Other Waters, and Section 2.4.10, Construction Phase Impacts, for a description of these impacts.
- Threatened and Endangered Species – Construction or dewatering activities in aquatic habitats within the biological study area could result in direct impacts to California red-legged frog and tidewater goby, which could result in injury or death to individuals. Temporary and permanent loss of habitat for each species would also occur. These impacts to threatened and endangered species are potentially significant under the California Environmental Quality Act and are discussed in Section 2.3.5, Threatened and Endangered Species, and Section 2.4.10, Construction Phase Impacts.
- Cultural Resources (Archaeology) – Potential impacts to unidentified, buried archaeological resources could occur during project construction, which could result in potentially significant impacts under the California Environmental Quality Act. Measures listed in Section 2.4.7 address the discovery of cultural materials and human remains during earthwork.
- Paleontology – Impacts to unidentified paleontological resources could occur during project construction, which could result in potentially significant impacts under the California Environmental Quality Act. Potential impacts are discussed in Section 2.4.8, Paleontology.
- Hazardous Waste/Materials – There is potential for asbestos-containing materials and lead-based paint coatings in structures that would be demolished to accommodate the proposed Chanticleer pedestrian overcrossing, and lead-based paint may be present in highway paint striping. Aerially deposited lead may be present in soil areas along the shoulders and median of Route 1, and wooden utility poles within the project footprint that may require removal or relocation may be coated with creosote. In addition, the potential for presence of petroleum projects in soil and groundwater is identified within

the project footprint. Remediation monitoring would also have to be conducted at the following Recognized Environmental Conditions sites. These sites are adjacent to the project area and would not be acquired for the project.

- Former Exxon 7-3604 facility (also listed as Pit Stop Service, Inc.), located at 836 Bay Avenue in Capitola;
- Redtree Properties, located at 819 Bay Avenue in Capitola;
- Unocal Station No. 6193, located at 1500 Soquel Drive in Santa Cruz; and
- BP 11240 facility, located at 2178 41st Avenue in Capitola.

Impacts from the aforementioned hazardous materials risks are potentially significant under the California Environmental Quality Act, and mitigation measures listed in Section 2.2.5, Hazardous Waste/Materials and Section 2.4.9, Construction Phase Impacts are required.

- Aesthetics/Visual – Route 1 is listed within the State Scenic Highways system as eligible for listing, but it has not been officially designated by the state, although it has been by Santa Cruz County. The proposed Tier II Auxiliary Lane Alternative would create visual changes as a result of highway widening, removal of mature trees and other vegetation, and construction of the Chanticleer pedestrian overcrossing. For the Tier II project, these visual changes would be limited to the Capitola-Soquel Landscape Unit. These changes could result in potentially significant impacts under the California Environmental Quality Act. Potential impacts are discussed in Section 2.1.6, Visual/ Aesthetics, and Section 2.4.11, Construction Phase Impacts. Under the California Environmental Quality Act, the aforementioned impacts would be mitigated to a less than significant level with incorporation of mitigation measures, as described in Section 3.3.

3.2.4 Unavoidable Significant Environmental Effects

Tier I Corridor Alternatives

- Aesthetics/Visual – Route 1 is listed within the State Scenic Highways system as eligible for listing, but it has not been officially designated by the state, although it has been by Santa Cruz County. The proposed Tier I Corridor Alternatives would create significant visual changes within the 8.9-mile-long corridor as a result of highway widening, construction of retaining and soundwalls, removal of mature trees and other vegetation, and construction of new roadway structures. Viewer groups are expected to be sensitive to these changes, and these impacts are considered potentially significant per California Environmental Quality Act significance thresholds as described in Section 2.1.6, Visual/Aesthetics, and Section 2.4.11, Construction Phase Impacts.

The proposed Tier I Corridor Alternatives will result in unavoidable and significant effects, even with implementation of the mitigation measures described in Section 3.3.

Tier II Auxiliary Lane Alternative

There are no unavoidable significant environmental effects associated with this alternative.

California Environmental Quality Act Mandatory Findings of Significance

Tier I Corridor Alternatives

A California Environmental Quality Act Mandatory Findings of Significance is provided for the Tier I Corridor Alternatives. If a corridor alternative is selected, the successive projects when implemented will cause a direct change in the physical environment due to the substantial degradation of the existing visual quality of the corridor and its surroundings and for the potential to threaten the scenic highway eligibility of the affected portion of the facility.

Tier II Auxiliary Lane Alternative

The Tier II Auxiliary Lane Alternative has no significant impacts; therefore, Mandatory Findings of Significance do not apply.

3.2.5 Climate Change under the California Environmental Quality Act

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change by the United Nations and World Meteorological Organization in 1988, has led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of greenhouse gases generated by human activity, including carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the United States, the main source of greenhouse gas emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) make up the largest source of greenhouse gas emitting sources. The dominant greenhouse gas emitted is carbon dioxide, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation". "Greenhouse Gas Mitigation" is a term for reducing greenhouse gas emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from

climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels¹).

There are four primary strategies for reducing greenhouse gas emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower greenhouse gas emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued cooperatively.

Regulatory Setting

This section outlines state and federal efforts to comprehensively reduce greenhouse gas emissions from transportation sources.

State

With the passage of several pieces of legislation including State Senate and Assembly bills and Executive Orders, California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change.

Assembly Bill 1493, Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. Executive Order S-3-05 (June 1, 2005): The goal of this Executive Order is to reduce California's greenhouse gas emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by the 2020, and (3) 80 percent below the year 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32, Núñez and Pavley, The Global Warming Solutions Act of 2006: Assembly Bill 32 sets the same overall greenhouse gas emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that the California Air Resources Board create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.”

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this Executive Order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020.

¹ http://climatechange.transportation.org/ghg_mitigation/

Senate Bill 97 Chapter 185, 2007, Greenhouse Gas Emissions: Required the Governor's Office of Planning and Research to develop recommended amendments to the California Environmental Quality Act Guidelines for addressing greenhouse gas emissions. The amendments became effective on March 18, 2010.

Senate Bill 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization for each region must then develop a "Sustainable Communities Strategy" that integrates transportation, land use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 Chapter 585, 2009 California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill 32.

Federal

Although climate change and greenhouse gas reduction is a concern at the federal level, currently there are no regulations or legislation that have been enacted specifically addressing greenhouse gas emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency nor the Federal Highway Administration has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis². Federal Highway Administration supports the approach that climate change considerations should be integrated throughout the transportation decision-making process, from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by the Federal Highway Administration to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean

² To date, no national standards have been established regarding mobile source GHGs, nor has U.S. EPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.

Car Program” and Executive Order 13514 – *Federal Leadership in Environmental, Energy and Economic Performance*.

Executive Order 13514 (October 5, 2009): This order is focused on reducing greenhouse gases internally in federal agency missions, programs, and operations, but it also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

The United States Environmental Protection Agency’s authority to regulate greenhouse gas emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that greenhouse gas meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, the United States Environmental Protection Agency finalized an endangerment finding in December 2009. Based on scientific evidence, it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and the Environmental Protection Agency’s assessment of the scientific evidence that form the basis for the Environmental Protection Agency’s regulatory actions. The United States Environmental Protection Agency in conjunction with the National Highway Traffic Safety Administration issued the first of a series of greenhouse emission standards for new cars and light-duty vehicles in April 2010.³

The United States Environmental Protection Agency and the National Highway Traffic Safety Administration are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced greenhouse gas emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever greenhouse gas regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle greenhouse regulations.

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On August 28, 2012, the United States Environmental Protection Agency and National Highway Traffic Safety Administration issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected

³ <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>

to save approximately four billion barrels of oil and two billion metric tons of greenhouse gas emissions.

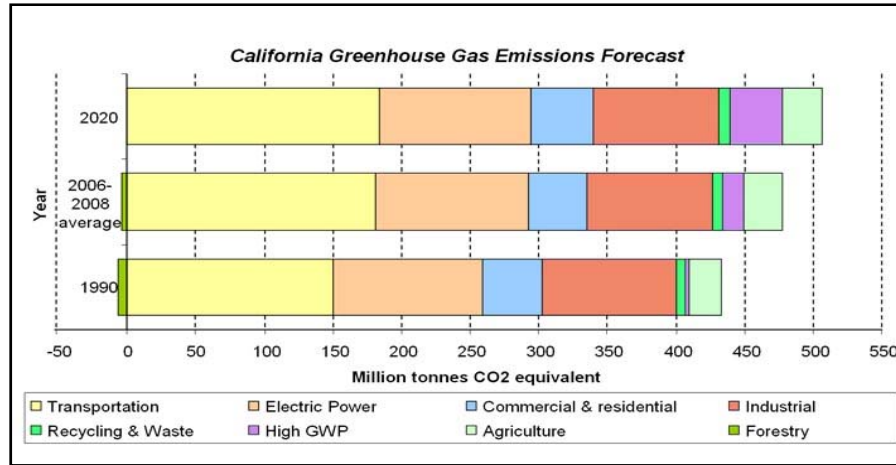
The complementary United States Environmental Protection Agency and National Highway Traffic Safety Administration standards that make up the Heavy-Duty National Program apply to combination tractors (semi trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce carbon dioxide emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

Project Analysis

An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of greenhouse gas⁴. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (California Environmental Quality Act Guidelines Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The Assembly Bill 32 Scoping Plan mandated by Assembly Bill 32 contains the main strategies California will use to reduce greenhouse gas emissions. As part of its supporting documentation for the Draft Scoping Plan, the California Air Resources Board released the greenhouse gas inventory for California (forecast last updated: October 28, 2010) (Figure 3-1). The forecast is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the greenhouse gas inventory for 2006, 2007, and 2008.

⁴ This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).



Source: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

Figure 3-1: California Greenhouse Gas Inventory Forecast

Caltrans and its parent agency, the Transportation Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98 percent of California’s greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human-made greenhouse gas emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.

One of the main strategies in the Caltrans’s Climate Action Program to reduce greenhouse gas emissions is to make California’s transportation system more efficient. As shown below, the highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (zero to 25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from zero to 25 miles per hour (see Figure 3-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, greenhouse gas emissions, particularly carbon dioxide, may be reduced. The purpose of the proposed project is to relieve congestion and improve operational efficiency on improve Route 1 in Santa Cruz from approximately 0.4 mile south of the San Andreas/ Larkin Valley Road interchange to 0.4 mile north of the Morrissey Boulevard interchange.

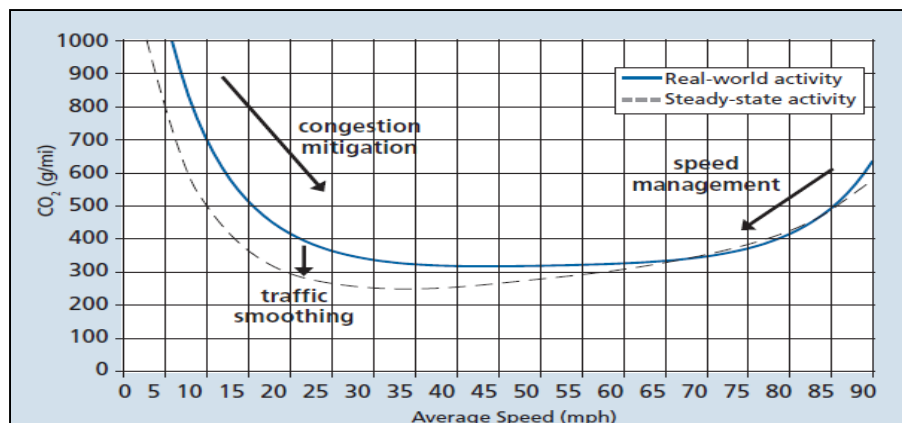


Figure 3-2: Possible Effect of Traffic Operation Strategies in Reducing On-Road Carbon Dioxide Emission

Tier I Corridor Alternatives

Peak-hour greenhouse gas emissions are presented in Table 3-1. The proposed project is designed to decrease congestion and increase vehicle speeds during the heavily congested peak hours. The HOV lanes will not greatly affect freeway speeds and flow during uncongested time periods; therefore, the peak-hour analysis is an accurate representation of how the Tier I Corridor Alternatives will change regional greenhouse gas emissions per day.

Table 3-1: Estimated Carbon Dioxide Emissions by Tier I Alternative – AM and PM Hours Emissions

Alternative	2015 (Metric Tons per AM and PM Peak Hours)	2035 (Metric Tons per AM and PM Peak Hours)
Existing	59	59
No Build	68	87
HOV Lane	69	71
TSM	64	94

Source: Based on vehicle miles traveled and speeds obtained from the Traffic Operations Report (2012); Emission factors obtained from EMFAC2011.

The Association of Monterey Bay Area Governments presented a regional greenhouse gas emissions inventory in the 2010 Monterey Bay Area Metropolitan Transportation Plan Draft Supplemental Environmental Impact Report. It is anticipated that regional 2015 greenhouse gas emissions would be 6,195 metric tons per day and 2035 greenhouse gas emissions would be 6,615 metric tons per day. The incremental increase in 2015 daily greenhouse gas emissions as a result of the Tier I Corridor HOV Lane Alternative would be approximately 0.02 percent and the incremental decrease in 2035 emissions would be approximately 0.24 percent. The incremental decrease in 2015 daily greenhouse gas emissions as a result of the Tier I Corridor TSM Alternative would be approximately 0.06 percent and the incremental increase in 2035 emissions would be approximately 0.35 percent.

Annual greenhouse gas emissions are presented in Table 3-2. The Association of Monterey Bay Area Governments did not present annual emissions in the Metropolitan Transportation Plan Draft Supplemental Environmental Impact Report. It is likely that annual emissions would follow the same trends as the peak-hour analysis provided above and that the various alternatives would affect regional greenhouse gas emissions by a maximum of 0.35 percent.

Table 3-2: Estimated Carbon Dioxide Emissions by Tier I Alternative – Annual Emissions

Alternative	2015 (Metric Tons per Year)	2035 (Metric Tons per Year)
Existing	380	380
No Build	397	380
HOV Lane	428	492
TSM	418	477

Source: Based on vehicle miles traveled and speeds obtained from the Traffic Operations Report (2012); Emission factors obtained from EMFAC2011.

The greenhouse gas estimations are not necessarily an accurate reflection of what the true carbon dioxide emissions will be because carbon dioxide emissions are dependent on other factors that are not part of the EMFAC2011 methodology, such as the fuel mix (EMFAC model emission rates are only for direct engine-out carbon dioxide emissions, not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components), rate of acceleration, and the aerodynamics and efficiency of the vehicles.

Tier II Alternatives

Peak-hour greenhouse gas emissions for the Tier II Auxiliary Lane Alternative are presented in Table 3-3. Peak-hour greenhouse gas emissions for the Tier II Auxiliary Lane Alternative would increase from existing conditions but would decrease by approximately one metric ton per year. Based on the Metropolitan Transportation Plan Draft Supplemental Environmental Impact Report, the Tier II Auxiliary Lane Alternative would affect regional greenhouse gas emissions by approximately 0.02 percent.

Table 3-3: Estimated Carbon Dioxide Emissions by Tier II Alternative – AM and PM Hours Emissions

Alternative	2015 (Metric Tons per AM and PM Peak Hours)
Existing	59
No Build	68
Auxiliary Lane	67

Source: Based on vehicle miles traveled and speeds obtained from the Traffic Operations Report (2012); Emission factors obtained from EMFAC2011.

Annual greenhouse gas emissions are presented in Table 3-4. The Association of Monterey Bay Area Governments did not present annual emissions in the Metropolitan Transportation Plan Draft Supplemental Environmental Impact Report. It is likely that annual emissions would follow the same trends as the peak-hour analysis provided above and that the various alternatives would affect regional greenhouse gas emissions by a maximum of 0.02 percent.

Table 3-4: Estimated Carbon Dioxide Emissions by Tier II Alternative – Annual Emissions

Alternative	2015 (Metric Tons per Year)
Existing	380
No Build	395
Auxiliary Lane	400

Source: Based on vehicle miles traveled and speeds obtained from the Traffic Operations Report (2012); Emission factors obtained from EMFAC2011.

Construction Emissions

Tier I Corridor Alternatives

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction greenhouse gas emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the greenhouse gas emissions produced during construction will be lessened to some degree by longer intervals between maintenance and rehabilitation events. Construction activity would generate approximately 14,467 metric tons per year of greenhouse gas emissions for the Tier I Corridor Alternatives.

Tier II Alternatives

Construction greenhouse gas emissions would be similar to that described for the Tier I Corridor Alternatives. Construction activity would generate approximately 2,903 metric tons of greenhouse gas emissions for the Tier II Alternatives.

Greenhouse Gas Reduction Strategies.

Assembly Bill 32 Compliance

Caltrans continues to be actively involved on the Governor’s Climate Action Team as the California Air Resources Board works to implement Executive Order S-3-05 and Executive

Order S-01-07 and help achieve the targets set forth in Assembly Bill 32. Many of the strategies Caltrans is using to help meet the targets in Assembly Bill 32 come from then-Governor Arnold Schwarzenegger’s Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in greenhouse gas emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain carbon dioxide reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 3-3 The Mobility Pyramid.



Figure 3-3: Mobility Pyramid

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans works closely with local jurisdictions on planning activities but does not have local land use planning authority.

Caltrans also assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the United States Environmental Protection Agency and California Air Resources Board.

Caltrans is also working towards enhancing the state’s transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill 375 (Steinberg 2008), Senate Bill 391(Liu 2009) requires the state’s long-range transportation plan to meet California’s climate change goals under Assembly Bill 32.

The California Transportation Plan is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas emissions. The California Transportation Plan defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the California Transportation Plan is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the California Transportation Plan 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs.

Table 3-5 summarizes Caltrans and statewide efforts that it is implementing to reduce greenhouse gas emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Caltrans Director's Policy 30 Climate Change (June 22, 2012): is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)⁵ provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

⁵ http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

Table 3-5: Climate Change Strategies

Strategy	Program	Partnership		Method/ Process	Estimated Carbon Dioxide Savings (million metric tons)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies and other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements and Intelligent Transportation System Deployment	Strategic Growth Plan	Caltrans	Regions	State Intelligent Transportation System; Congestion Management Plan	0.07	2.17
Mainstream Energy and Greenhouse Gas into Plans and Projects	Office of Policy Analysis and Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational and Information Program	Office of Policy Analysis and Research	Interdepartmental, California Environmental Protection Agency, California Air Resources Board, California Energy Commission		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening and Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Nonvehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5% limestone cement mix 25% fly ash cement mix >50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	California Environmental Protection Agency; California Air Resources Board; Business, Transportation, and Housing Agency; Metropolitan Planning Agencies		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18
Source: Caltrans.						

The following measures will reduce the greenhouse gas emissions and potential climate change impacts from the proposed project:

1. Caltrans and the California Highway Patrol are working with regional agencies to implement intelligent transportation systems to help manage the efficiency of the existing highway system. Intelligent transportation systems are commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
2. RTC provides ridesharing services and park-and-ride facilities to help manage the growth in demand for highway capacity.
3. According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to 10 minutes in each direction.
4. The construction contractor must comply with Monterey Bay Unified Air Pollution Control District rules, ordinances, and regulations in regards to air quality restrictions.

Adaptation Strategies

Adaptation Strategies refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration, released its interagency report on October 28, 2011⁶, outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks.

⁶ <http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation>

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, former Governor Arnold Schwarzenegger signed Executive Order S-13-08, which directed many state agencies to address California's vulnerability to sea level rise caused by climate change. This Executive Order set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency was directed to coordinate with local, regional, state, and federal public and private entities to develop. The California Climate Adaptation Strategy (Dec 2009)⁷, which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to Executive Order S-13-08 that specifically asked the California Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The California Natural Resources Agency was to prepare a Sea Level Rise Assessment Report⁸ to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.

⁷ <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>

⁸ *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.

- The range of uncertainty in selected sea level rise projections.
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, the Coastal Ocean Climate Action Team updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data

All projects that have filed a Notice of Preparation as of the date of the Executive Order S-13-08, and/or are programmed for construction funding through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. The Santa Cruz Route 1 Project filed a Notice of Preparation prior to Executive Order S-13-08.

As previously discussed, the project is not a routine maintenance project. This analysis is required to discuss the effects of climate change on the project area and facility, such as increased erosion due to storms or flooding, inundation due to higher sea levels, long periods of intense heat, and other factors that may affect the facility during the life of the proposed project. The potential for sea level rise to affect the project was considered, in accordance with Caltrans' Guidance on Incorporating Sea Level Rise, by considering the following three questions with regard to the project:

1. Is the project located on the coast or in an area vulnerable to sea level rise?
2. Will the project be impacted by the stated sea level rise?
3. Is the design life of the project beyond year 2030?

The Tier I Corridor Alternatives are partially located in the coastal zone (see Figure 2.1.1-2: Coastal Zone Boundary), and the Tier II Auxiliary Lane Alternative is located outside the coastal zone. Using the sea level rise projections in Table 2 of the Guidance on Incorporating Sea Level Rise, the Tier I and Tier II projects would not be potentially affected by an increase in sea level. The high sea level rise projection for the year 2100 indicates an increase in water surface elevation of 55 inches. Table 4 in the Location Hydraulic Study Report

shows that, for four out of the five floodplains associated with the project, the roadway elevations are higher than the 100-year base floodplain water surface elevations by 13.1 to 36.1 feet. At Arana Gulch, the 100-year water surface elevation already overtops the roadway in the existing conditions; however, the water surface elevation at the Route 1 crossing of Arana Gulch (water surface elevation of approximately 70 feet under existing conditions and under the proposed alternatives) is controlled by watershed runoff, not by backwater from the ocean. Therefore, an increase in sea level rise would not affect the Tier I or Tier II projects at the floodplains associated with creek crossings.

Overall, the Tier I and Tier II projects would not be potentially affected by an increase in sea level rise. The design life of both projects is beyond the year 2030.

In conclusion, the Tier I Corridor Alternatives are partially located in the coastal zone and their design life is beyond 2030. However, these alternatives would not potentially be affected by sea level rise.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess the vulnerability of transportation systems to sea level rise affecting safety, maintenance, and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects; however, without statewide planning scenarios for relative sea level rise and other climate change effects, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans will be able to review its current design standards to determine what changes, if any, may be warranted to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted in response to Executive Order S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

3.3 Mitigation Measures for Significant Impacts under the California Environmental Quality Act

Environmental resources for which implementation of mitigation measures is required to reduce impacts to less than significant under the California Environmental Quality Act are

summarized below. Separate summaries are provided for the Tier I Corridor Alternatives and Tier II Auxiliary Lane Alternative.

Tier I Corridor Alternatives

- Biological Resources – Mitigation measures required for both Tier I Corridor Alternatives to address potentially significant impacts to biological resources are listed in Section 2.3.1, Natural Communities; Section 2.3.2, Wetlands and Other Waters; Section 2.3.3, Plant Species; Section 2.3.4, Animal Species; Section 2.3.5, Threatened and Endangered Species; Section 2.3.6, Nesting Birds; and Section 2.3.7, Invasive Species.
- Cultural Resources (Archaeology) – Mitigation measures required for both Tier I Corridor Alternatives to address potentially significant impacts to archaeological resources are listed in Section 2.1.7, Cultural Resources and Section 2.4.7, Construction Phase Impacts.
- Paleontological Resources – Mitigation measures required to address potentially significant impacts to unidentified, buried paleontological resources are listed in Section 2.4.8, Construction Phase Impacts.
- Hazardous Waste/Materials – Mitigation measures required for both Tier I Corridor Alternatives are listed in Section 2.2.5, Hazardous Waste/Materials and Section 2.4.9, Construction Phase Impacts.
- Aesthetics/Visual – The Tier I Corridor Alternatives are being considered at the planning level only and may be phased over time. Because it is not known when the projects would go forward, the mitigation measures described for the Tier I Corridor Alternatives, listed in Section 2.1.6, Visual/Aesthetics and Section 2.4.11, Construction Phase Impacts, would also apply to any future Tier II projects, pending further environmental reviews for those projects.

Tier II Auxiliary Lane Alternative

- Biological Resources – Mitigation measures required to address potentially significant impacts to wetlands and other waters and threatened and endangered species that could occur under the Tier II Auxiliary Lane Alternative are listed in Section 2.3.1, Natural Communities; Section 2.3.2, Wetlands and Other Waters; and Section 2.3.5, Threatened and Endangered Species. Cultural Resources (Archaeology) – Mitigation measures required to address potentially significant impacts to unidentified, buried archaeological resources that could occur under the Tier II Auxiliary Lane Alternative are listed in Section 2.4.7, Construction Phase Impacts.
- Paleontological Resources – Mitigation measures required to address potentially significant impacts to unidentified, buried paleontological resources that could occur under the Tier II Auxiliary Lane Alternative are listed in Section 2.4.8, Construction Phase Impacts.

- Hazardous Waste/Materials – Mitigation measures for the Tier II Auxiliary Lane Alternative are required to reduce impacts from hazardous materials to less than significant and are described in Section 2.2.5, Hazardous Waste/Materials and Section 2.4.9, Construction Phase Impacts.
- Aesthetics/Visual – The Tier II Auxiliary Lane Alternative requires implementation of mitigation measures to reduce potentially significant visual impacts that could result; these are described in Section 2.1.6, Visual/Aesthetics and Section 2.4.11, Construction Phase Impacts.

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