

Chapter 3 California Environmental Quality Act (CEQA) Evaluation

The Interstate 5 (I-5) Improvement Project between Interstate 405 (I-405) and State Route 55 (SR-55) (proposed project) is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) 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 (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other actions required by applicable federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 United States Code Section 327 (23 USC 327) and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an Environmental Impact Statement (EIS), or a lower level of documentation, will be required. NEPA requires that an EIS 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 CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, 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 (EIR) must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the *State CEQA Guidelines* list a number of "mandatory findings of significance," which also require the preparation of an EIR. There are no types of

actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

3.1 CEQA Environmental Checklist

This CEQA Checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects will indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as Best Management Practices (BMPs) and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 in order to provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This CEQA Checklist incorporates by reference the information contained in Chapters 1 and 2.

3.1.1 Aesthetics

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Aesthetics

a) No Impact. There are no distinct natural open spaces or natural features found in the Study Area, as discussed in more detail in Section 2.1.1, Existing and Future Land Use. As a result, the Build Alternative would not affect scenic views or result in the loss of any scenic resources in the area. Therefore, the Build Alternative would result in no impacts related to scenic vistas. No mitigation is required.

b) No Impact. I-5 is not a State-designated Scenic Highway, and there are no State-designated Scenic Highways crossing or in the vicinity of the project limits. As discussed earlier, there are no distinct views along the I-5 corridor. Therefore, the Build Alternative would result in no impacts related to scenic highways or resources. No mitigation is required.

c) Less Than Significant Impact. The construction of the Build Alternative would result in temporary visual changes as a result of construction activities including: removing vegetation, grading, the use of night lighting, dust control, temporary structures, hauling equipment, construction staging or laydown yards, and signs indicating traffic detours. However, after construction is completed, these temporary impacts would no longer occur. Areas identified for revegetation would be replanted at the completion of construction. Because construction impacts are temporary and disturbed areas would be revegetated on completion of construction, no permanent change in visual character and/or quality would occur. The Build Alternative would present a low to moderate-to-low degree of alterations to the existing visual character and visual quality due to similarities between the current condition of the project corridor and the project improvements, as described in more detail in Section 2.6.3.2. Implementation of Project Features PF-VIS-1 through PF-VIS-3, provided in Section 2.6.3, will address visual impacts during construction and operation of the project. Therefore, the potential visual impacts during construction and operation of the Build Alternative would be less than significant.

d) Less Than Significant Impact. Existing light sources in the Study Area include traffic, street lighting, and lighted parking lots; signalization at intersections and

freeway on- and off-ramps; commercial/industrial/business park areas; and limited light sources from residential areas. Some existing light fixtures within the freeway right-of-way along the project limits would be relocated as part of the Build Alternative. The relocated light fixtures would be designed and installed consistent with existing Caltrans standards. The relocated light fixtures would be similar in location, function, and light intensity as the existing lighting. As a result, the changes in light fixtures under the Build Alternative would not result in impacts related to lighting, and no mitigation is required.

Since the project limits are situated in an urbanized environment, viewer groups are expected to undergo the same exposure to artificial light at night. During the day, glare from reflective surfaces, such as windows and metallic details on cars travelling on the roadway, is expected and intensifies when the direction and angle of sunlight changes, especially in hot summer months. The Build Alternative would introduce a new source of glare through the addition of new travel lanes; however, these would be the same as the existing sources of glare on I-5. As a result, the Build Alternative would have a less than significant impact related to glare, and no mitigation is required.

3.1.2 Agriculture and Forest Resources

<p>In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.</p>				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Agriculture and Forest Resources

a) No Impact. Although there is designated Prime Farmland, Unique Farmland, and Farmland of Statewide Importance within the Study Area, directly south of the I-5/ I-405 interchange and north of the project along State Route 133 (SR-133), according to the Farmland Mapping Monitoring Program of the California Resources Agency (Orange County Important Farmland 2014); however, none of these designated farmland uses would be converted to a transportation or other non-agricultural use as part of the Build Alternative. While some other additional land that is currently being used for agricultural purposes may be permanently impacted under the Build Alternative, these are not designated Prime Farmland, Unique Farmland, and Farmland of Statewide Importance as described by the California Department of Conservation (Orange County Important Farmland 2014). Refer to Figure 2.1-1, Existing Land Uses, in Section 2.1, Land Use. The Build Alternative would have no impact on this type of designated farmland.

b) No Impact. As indicated in Section 2.1.4.2, the Build Alternative would not involve the permanent or temporary conversion of agricultural land use as defined in a General Plan to a transportation or other non-agricultural use, because no agricultural land has been zoned within the Study Area by the local jurisdictions’ General Plans (see Figure 2.1-2). However, as seen on Figure 2.1-1, Existing Land Use, there is land currently used for agricultural purposes within the Study Area. As seen in Table 2.1.3, a small amount of existing agricultural land use (0.16 acre [ac] under Alternative 2A and Alternative 2A Option 3, 0.24 ac under Alternative 2B

(Preferred Alternative), and 0.25 ac under Alternative 2B Option 3) would be permanently impacted. Additionally, 2.15 ac of existing agricultural land use would be temporarily impacted under Alternative 2A and Alternative 2A Option 3. Alternative 2B (Preferred Alternative) and Alternative 2B Option 3 would have a temporary impact to 1.99 ac of existing agricultural land uses. However, as these existing land uses are not zoned for exclusive agricultural use or subject to Williamson Act contracts, no impact would occur.

c), d) No Impact. There is no forest land, timberland, or timberland-zoned timberland production areas within the Study Area. I-5 within the project limits is within an urbanized area. No impact to or conversion of forest or timberlands would occur as a result of the Build Alternative.

e) No Impact. As described in Section 2.1.4.2, the Build Alternative involves a lane addition and other improvements to an existing freeway facility and would not have substantial permanent effects related to plan consistency and land use compatibility. The majority of conversion from current and planned land uses to transportation uses would occur on land that is already within Caltrans right-of-way. No changes in the existing environment would occur that could result in conversion of Farmland to non-agricultural use or forestland to non-forest use. No impact would occur.

3.1.3 Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Air Quality

The potential for the Build Alternative to adversely impact air quality was assessed in the *Air Quality Assessment Report* (March 2017) and Section 2.13, Air Quality, of this Initial Study/Environmental Assessment (IS/EA). The following discussion is based on those analyses.

a) No Impact. The Build Alternative is listed in the Southern California Association of Governments (SCAG) *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS), which was found to conform to the State Implementation Plans (SIP) by the FHWA and the Federal Transit Administration (FTA) on June 1 and 2, 2016. The Build Alternative is also included in SCAG’s financially constrained 2017 *Federal Transportation Improvement Program* (FTIP). The 2017 FTIP was determined to conform to the SIP by the FHWA and the FTA on December 16, 2016. The design concept and scope of the Build Alternative is consistent with the Project Description in the 2016–2040 RTP/SCS and the 2017 FTIP, and the traffic assumptions of SCAG’s regional emissions analysis. The listings of the Build Alternative in the 2016–2040 RTP/SCS and the 2017 FTIP are provided in Appendix E. The Build Alternative would not conflict with or obstruct the implementation of any applicable air quality management plan (AQMP). No mitigation is required.

b) Less Than Significant Impact. Short-term impacts to air quality would occur during demolition, grading/trenching, structure construction, new pavement construction, and the restriping phases as described in more detail in Section 2.13.3.1. All construction vehicles and equipment would be required to be equipped with the State-mandated emission control devices pursuant to State emission regulations and standard construction practices. After construction of the Build Alternative is complete, all construction-related impacts would cease. Short-term construction particulate matter emissions would be further reduced with the implementation of required dust suppression measures outlined within the South Coast Air Quality Management District (SCAQMD) Rule 402 and 403. Caltrans Standard Specifications for Construction (Section 14-9.03 [Dust Control]) would also be adhered to. Therefore, construction of the Build Alternative would not violate State or

federal air quality standards or contribute to the existing air quality violations in the South Coast Air Basin.

The Build Alternative would not be considered a project of air quality concern (POAQC) under 40 Code of Federal Regulations (CFR) 93.123(b)(1). The Build Alternative was submitted to stakeholders at a Transportation Conformity Working Group (TCWG) meeting on June 28, 2016, pursuant to the interagency consultation requirement of 40 CFR 93.105 (c)(1)(i). The members of the TCWG confirmed that the Build Alternative would not be a POAQC as it would not create a new, or worsen an existing, particulate matter less than 2.5 microns in size (PM_{2.5}) violation.

The proposed project is within an attainment/maintenance area for carbon monoxide (CO). A CO hot-spot analysis was performed per the 1997 Transportation Project-Level Carbon Monoxide Protocol (CO Protocol). The analysis concluded that implementation of the Build Alternative would reduce congestion and overall travel time due to overall improvements in vehicle hours traveled (VHT) under the build conditions. Additionally, the Build Alternative does not involve parking lots, and therefore would not increase the number of vehicles operating in cold start mode. As a result, the Build Alternative is not likely to worsen air quality.

A quantitative Mobile Source Air Toxics (MSAT) analysis determined that the Build Alternative would not increase diesel particulate matter (DPM) and MSAT emissions when compared to the Baseline. For each of the nine toxic air contaminants that are a subset of the 188 air toxics defined by the Federal Clean Air Act, emissions (in lbs/day) range from 63 percent to 93 percent lower for the 2030 Build Alternative than the existing conditions (see Table 2.13.4). For the horizon year 2050, MSAT emissions range 66 percent to 94 percent lower for the Build Alternative (see Table 2.13.5). The Build Alternative would not result in a substantial increase in truck average daily traffic (ADT) as it would not involve a truck route, add diesel truck capacity, or be a major traffic generator. It should be noted that emissions would likely be lower than present levels in the design year as a result of the United States Environmental Protection Agency's (EPA) national control programs that are projected to reduce annual MSAT emissions by 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, vehicle miles traveled (VMT) growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the Study Area are likely to be lower in the future in nearly all cases.

The project limits are within a maintenance area for federal PM₁₀ standards and a nonattainment area for federal PM_{2.5} standards. Therefore, per 40 CFR Part 93, hot-spot analyses are required for conformity purposes. However, the EPA does not require hot-spot analyses (either qualitative or quantitative) for those that are not listed in Section 93.123(b)(1) as a POAQC (see Section 2.13.3 for more information). The Build Alternative would not involve a substantial amount of diesel truck traffic, as truck volumes would be approximately 5.5 percent of the total vehicles on I-5, and is in compliance with the RTP/FTIP. Additionally, the Build Alternative would improve overall performance, reduce congestion, increase ramp and mainline capacity, and improve operational deficiencies at merge and diverge locations within the project limits. Therefore, the Build Alternative meets the Clean Air Act requirements, is not a POAQC, would not cause or contribute to a violation of National Ambient Air Quality Standards (NAAQS) for PM_{2.5}, and would not create a new or worsen an existing PM_{2.5} violation.

c) Less Than Significant Impact. The Build Alternative would not result in concentrations exceeding the 1-hour or 8-hour CO standards, would not delay the attainment of the PM_{2.5} or PM₁₀ ambient air quality standards (AAQS) in the South Coast Air Basin, and would not result in a cumulatively considerable net increase of these pollutants; and impacts are considered less than significant. No mitigation is required.

d) Less Than Significant Impact. As discussed in Section 2.13.2.3 in this IS/EA, the sensitive receptors in the vicinity of the project limits are residences, hotels, schools, playgrounds, childcare centers, athletic facilities, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes. The Build Alternative may result in temporary, short-term construction-related increases in pollutant concentrations associated with construction equipment emissions and fugitive dust. However, implementation of Project Features PF-AQ-1 through PF-AQ-3 and Measure AQ-4 provided in Section 2.13.3 will address those potential short-term air quality impacts on sensitive receptors.

e) Less Than Significant Impact. The Build Alternative may result in temporary, short-term construction-related objectionable odors from sources such as equipment emissions and asphalt paving. Project Features PF-AQ-1 through PF-AQ-3 and Measure AQ-4 provided in Sections 2.13.3 and 2.13.4 will address any potential short-term odor impacts, and potential odor impacts are less than significant.

The operation of the Build Alternative would result in a less than significant impact related to CO, PM_{2.5}, and PM₁₀ as outlined in Responses 3.1.3 b) and c), above. No mitigation is required.

3.1.4 Biological Resources

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Biological Resources

The potential for the Build Alternative to result in adverse impacts to biological resources was assessed in the Natural Environment Study (NES, May 2017), the Jurisdictional Delineation (JD, February 2017), and Sections 2.15, Natural Communities; 2.16, Wetlands and Other Waters; 2.17, Plant Species; 2.18, Animal Species; and 2.19, Invasive Species, in this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. The biological Study Area (BSA) is highly disturbed and does not contain high quality suitable habitat for many special-status species. The only habitat and natural community within the BSA of special concern is riparian in the form of freshwater marsh located in Peters Canyon Wash. The preliminary temporary construction easement (TCE) includes only the paved areas adjacent to Peters Canyon Wash and the nonwetland areas upstream which are concrete lined and would not result in direct impacts to adjacent riparian habitat. Based on a field survey, southern tarplant does not appear to occur in the BSA. As a result, the construction of Build Alternative would not result in temporary or permanent impacts on southern tarplant or other special-status plant species. No mitigation is required.

The Build Alternative is not anticipated to impact suitable habitat for the western pond turtle located within Peters Canyon Wash; however, the preliminary TCE is located adjacent to the habitat as well as upstream. Therefore, locations outside grading limits could be indirectly temporarily impacted by dust, changes in hydrology, erosion, siltation, increased runoff, and invasion by nonnative species introduction and spreading during construction of the Build Alternative. With compliance with Measures BIO-6 through BIO-10, provided in Section 2.18.4, potential temporary impacts to western pond turtle during construction of the Build Alternative would be less than significant. No mitigation is required.

Construction of the Build Alternative could also temporarily impact nesting birds protected under the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code either directly as a result of the removal of trees occupied by nesting birds or disturbances to bridge and crevice habitat, or indirectly as a result of disturbances near trees occupied by nesting birds. With implementation of Measure BIO-11, provided in Section 2.18.3, potential temporary impacts to nesting birds during project construction and therefore impacts would be less than significant. No mitigation is required.

Special-status bridge/culvert and crevice-dwelling animal species have the potential to occur within the BSA. Yuma myotis, a California Department of Fish and Wildlife (CDFW) Special Animal, was observed within two structures within the BSA: Bee Canyon Bridge beneath I-5 and Michelle Road Bridge over the El Modena-Tustin Channel. Other bat species that may roost in structures within the BSA include Mexican free-tailed bat, big brown bat, and pallid bat, a CDFW Species of Special Concern. In addition, bat species that may roost in trees within the BSA include western yellow bat, a CDFW Species of Special Concern and hoary bat, a CDFW Special Animal.

Construction activities of the Build Alternative could impact bats and other bridge- and crevice-nesting special-status species directly as a result of bridge or culvert widening or replacement activities. In addition, construction of the Build Alternative could also indirectly and temporarily impact bats or bat-roosting habitat; the impacts are from dust, noise, and vibration in the vicinity of roost sites. Direct temporary impacts could include destruction or loss of roosting habitat through demolition or removal of structure or portions of a structure that contain roost features (under Alternative 2A only) or tree trimming or removal. By complying with Measures BIO-12 through BIO-18, provided in Section 2.18, potential impacts to special-status bat species are less than significant. No mitigation is required.

b) and c) Less Than Significant Impact. The Build Alternative would impact United States Army Corps of Engineers (USACE), CDFW, and Regional Water Quality Control Board (RWQCB) jurisdictional areas. Temporary impacts to approximately 5.11 ac of nonwetland waters subject to USACE jurisdiction would occur under Alternative 2A, and 5.10 ac would be temporarily impacted under Alternative 2B (Preferred Alternative). The Build Alternative would result in approximately 0.71 ac of permanent impacts to nonwetland waters subject to USACE jurisdictional areas as a result of the modifications to drainages.

The impacts to waters under the jurisdiction of the RWQCB would be the same as described above for the USACE.

Alternative 2A would temporarily impact 5.13 ac of nonwetland waters subject to CDFW jurisdiction, and 5.12 ac under Alternative 2B (Preferred Alternative). Alternative 2A would also have 5.82 ac of permanent impacts to drainages subject to CDFW jurisdiction, and 5.79 ac under Alternative 2B (Preferred Alternative).

The San Diego Creek Watershed Special Area Management Plan (SAMP 2012) identified restoration priorities and compensatory mitigation areas in the San Diego Creek Watershed as Aquatic Resource Integrity Areas. Because the Build Alternative would not result in any impacts to any Aquatic Resource Integrity Areas, the potential project impacts on waters are subject to an abbreviated alternative permitting process associated with the SAMP. If the Build Alternative is found to be consistent with the San Diego Creek Watershed SAMP by the resource agencies, a Letter of Permission (LOP)/Watershed Streambed Alteration Agreement (WSAA) would be issued to authorize the discharge of dredged and/or fill materials into waters of the United States and waters of the State, respectively. If the Build Alternative is found not to be consistent with the San Diego Creek Watershed SAMP, an Individual Permit from the USACE and a standard Streambed Alteration Agreement (SAA) from the CDFW would be required.

While specific compensatory mitigation is not expected to be required by the resource agencies for the Build Alternative, measures are expected to be required as conditions of the LOP/WSAA. “Proposed General Conditions for the San Diego Creek Watershed Letter of Permission” included in the SAMP list specific conditions that may be included in a LOP for a project. If compensatory mitigation is ultimately required by the resource agencies for the project impacts on waters, that mitigation would be determined in coordination with the regulatory agencies based on the quality and quantity of jurisdictional resources affected by the Build Alternative. If required, compensatory mitigation would be provided through the Measure M2 Freeway Transportation Mitigation Program. In addition, Project Features PF-WET-1 (Section 2.16.3), PF-BIO-1 through PF-BIO-5 (Section 2.15.4), and PF-WQ-1 through PF-WQ-5 (Section 2.9.3) will address potential impacts to areas under USACE and CDFW jurisdiction. No mitigation is required.

d) Less Than Significant Impact. The Build Alternative would not interfere with the movement of any native resident or migratory fish or impede the use of native wildlife nursery sites. As discussed in the NES, no wildlife was observed during the 2016 focused surveys; therefore, the project site does not appear to function as a wildlife movement corridor. Therefore, the Build Alternative would not affect wildlife movement corridors or interfere with established native resident migratory wildlife corridors.

Even though no wildlife was observed during the 2016 focused surveys, wildlife movement of species such as bobcats (*Lynx rufus*) and coyotes could occur within the

BSA; however, substantial movement is not expected under the I-5 bridge crossings within the BSA due to lack of habitat and cover. During construction of the Build Alternative, incremental increases in night lighting, noise, human activity, risk of wildfire, and impacts to water quality could temporarily impact and discourage bobcat and coyote presence in BSA. However, these species would likely continue to utilize the BSA when construction workers are not present and equipment is not operating. Therefore, construction of the Build Alternative would not result in any substantial adverse temporary impacts to wildlife movement.

The BSA may contain potentially suitable habitat for migratory birds protected under the Migratory Bird and Treaty Act (MBTA) and the California Fish and Game Code. These species may nest in trees or within bridges and crevices. Construction of the Build Alternative could impact nesting birds either directly as a result of the removal of trees occupied by nesting birds or disturbances to bridge and crevice habitat, or indirectly as a result of disturbances near trees occupied by nesting birds. With compliance with Measure BIO-11, provided in Section 2.18.3, potential impacts to migratory birds are less than significant. No mitigation is required.

e) No Impact. There are no local policies or ordinances protecting biological resources that are relevant to the BSA. Therefore, the Build Alternative would not conflict with local policies or ordinances protecting biological resources. No mitigation is required.

f) Less Than Significant Impact. Central/Coastal Subregion Natural Community Conservation Plan (NCCP) and Habitat Conservation Plan (HCP) are applicable to the area within and in the vicinity of the BSA. Although the proposed project occurs within the Central/Coastal NCCP Subregion, Caltrans and the Orange County Transportation Authority (OCTA) did not contribute funding to the development of the NCCP/HCP and reserve system; therefore, they are considered to be non-participating landowners. However, OCTA Measure M Transportation Investment Plan (M2) NCCP and HCP are applicable to the Build Alternative. The OCTA Measure M2 NCCP and HCP include measures to minimize take of identified species and their habitats. Avoidance, minimization, and mitigation (if necessary) of impacts on identified species and their habitats will be implemented through a process that verifies that construction activities undertaken as part of the project adhere to a set of protection measures.

3.1.5 Cultural Resources

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Cultural Resources

The potential for the Build Alternative to result in adverse impacts related to cultural and paleontological resources was assessed in the Historic Property Survey Report (HPSR, November 2017) and the attachments to the HPSR, the Paleontological Resources Identification and Evaluation Report (PIR/PER, March 2017), and Sections 2.7, Cultural Resources, and 2.11 Paleontology, of this IS/EA. The following discussions are based on those analyses. In accordance with Public Resource Code (PRC) section 21080.3.1 and Assembly Bill (AB) 52, Caltrans initiated early consultation with California Native American Tribes in July 2015. Refer to Chapter 4 of this IS/EA for detailed information pertaining to California Native American Tribe consultation.

a) and b) Less Than Significant Impact. It was determined there are no National Register of Historic Places (National Register) listed or eligible cultural resources in the project Area of Potential Effects (APE). As a result, no cultural resources qualify as historical resources pursuant to CEQA, or are exempt per the Section 106 Programmatic Agreement (PA). In addition, it has been determined that a finding of No Historic Properties Affected is appropriate because there are no historical resources within the APE or there are no impacts to historical resources pursuant to *State CEQA Guidelines* Section 15064.5(b)(3). Seven built-environment resources were evaluated for the Build Alternative and determined ineligible for listing on the National Register and also determined ineligible as a historical resource under CEQA. These resources are listed in Table 3.1.1.

Table 3.1.1: Built Resources Within the Project APE

Name	Address/Location	Community	National Register/California Register Eligibility¹
Las Casas Apartment Homes	15491 Pasadena Avenue (APN 402-362-22)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA
King's Way Church	600 West Sixth Street (APN 401-341-01)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA
Cathedral of Christ the King	655 South B Street (APN 401-631-05)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA
El Camino Plaza	610-712 El Camino Real (APN 401-631-15)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA
N/A	1431-1439 Nisson Road (APN 432-042-01)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA
N/A	1451 Nisson Road (APN 432-042-02)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA
Al's Woodcraft	1471 Nisson Road (APN 432-042-06)	Tustin	<ul style="list-style-type: none"> • Determined ineligible as a historic property under Section 106 PA • Determined ineligible as historical resource under CEQA

Source: *Historical Resources Evaluation Report* (2017); *Historic Property Survey Report* (2017)

¹ These determinations are a result of studies conducted for the I-5 Improvement Project.

APN= Assessor's Parcel Number

California Register = California Register of Historical Resources

CEQA = California Environmental Quality Act

I-5 = Interstate 5

N/A = not applicable

National Register = National Register of Historic Places

Section 106 = Section 106 of the National Historic Preservation Act of 1966

No archaeological resources requiring evaluation were identified through archival research, consultation, or field survey, and the APE does not appear to be sensitive in terms of archaeological resources.

However, there is the potential to encounter unknown buried cultural resources or archaeological materials within the project disturbance limits during construction of the Build Alternative. If buried cultural resources or archaeological materials are exposed during construction, it is Caltrans policy that work in the area must halt until a qualified archaeologist can evaluate the nature and significance of the find. In the event that previously unknown buried cultural materials are encountered during construction, compliance with Project Feature PF-CR-1, provided in Section 2.7.3,

potential impacts to previously unknown cultural resources would be less than significant. No mitigation is required.

c) Less Than Significant with Mitigation Incorporated. Geologic mapping shows that the Study Area contains Holocene to late Pleistocene (less than 126,000 years ago) Young Alluvial Fan Deposits. Although not mapped, Artificial Fill was also noted in many portions of the Study Area during the pedestrian survey. Because of its disturbed context, Artificial Fill does not have the potential to contain scientifically significant paleontological resources. The upper 10 feet (ft) of the Young Alluvial Fan Deposits are unlikely to contain scientifically significant paleontological resources because of their young age (likely less than 4,200 years). However, the sediments of the Young Alluvial Fan Deposit below a depth of 10 ft may be old enough to contain scientifically significant paleontological resources. Excavation during construction of the Build Alternative may extend below a depth of 10 ft and, therefore, may have the potential to impact paleontological resources. Measure PAL-1, provided in Section 2.11.4, requires preparation and implementation of a Paleontological Mitigation Plan (PMP) in the event paleontological resources are encountered during project excavation. The PMP shall be prepared concurrently with final design plans during the Plans, Specifications, and Estimates (PS&E) phase. Adherence to the PMP during construction would reduce potential impacts to less than significant.

d) Less Than Significant Impact. No human remains are known to exist within the project APE. Therefore, construction of the Build Alternative would not impact known human remains. If human remains are exposed during construction, Project Feature PF-CR-2 provided in Section 2.7.3 requires compliance with State Health and Safety Code Section 7050.5, which states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains and that the Orange County Coroner shall be contacted. Pursuant to California PRC Section 5097.98, if the remains are thought to be Native American, the Coroner will notify the Native American Heritage Commission, which will then notify the Most Likely Descendant (MLD). At the same time, the Caltrans District 12 Environmental Branch Chief or the District 12 Native American Coordinator will be contacted so they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC Section 5097.98 are to be followed as applicable. No mitigation is required.

3.1.6 Geology and Soils

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Geology and Soils

The potential for the proposed project to result in adverse impacts related to geology and soils was assessed in the Preliminary Geotechnical Report (February 2017). The findings of the report are discussed in Section 2.10, Geology/Soils/Seismic/Topography, in this IS/EA. The following discussions are based on those analyses.

a) i) No Impact. The project limits are not in an Alquist-Priolo Earthquake Fault Zone, and there are no known active or potentially active faults mapped as crossing or in the immediate vicinity of I-5. Because the project limits are not crossed by a

known fault and are not in an Alquist-Priolo Earthquake Fault Zone, the improvements in the Build Alternative are not expected to be exposed to effects associated with fault displacement and ground rupture. No mitigation is required.

a) ii) and iii) Less Than Significant Impact. The principal seismic hazard in the vicinity of the project limits is ground shaking resulting from an earthquake along one of several major active or potentially active faults that could damage I-5 facilities and structures. Those faults include the San Joaquin Hills Blind Thrust Fault (located beneath the project area), the Whittier Fault (approximately 13 miles [mi] away), Pelican Hill Fault, and the Newport-Inglewood Fault (both approximately 7 mi away). Moderate-to-intense seismic shaking is likely to occur in the Study Area during the life of the improvements provided by the Build Alternative. As a result, the Build Alternative would be subject to effects associated with seismic shaking that could damage bridges, ramps, other structures, or the road surfaces. With design and construction of the Build Alternative consistent with the Caltrans *Highway Design Manual* (2016), other required standards, and recommendations from the Final Geotechnical Design Report, as required in Project Feature PF-GEO-1 provided in Section 2.10.3, potential for seismic damage to project facilities is less than significant. No mitigation is required.

a) iv) No Impact. The City of Irvine's Open Space Conservation Element (2015), the City of Tustin's Safety Element (2013), and the Map of Localities in Los Angeles Region were reviewed and indicated that topography in the area is flat and does not contain known landslide areas as a result of steep slopes. Similarly, unstable geologic formations, as identified in Figure D-3 of the City of Irvine's Seismic Element (2015), occur outside of the Study Area. Nonseismically induced earth movement is unlikely to occur in the Study Area. Because there are no mapped landslides within or in the vicinity of the project limits, no permanent effects on the Build Alternative related to landslides are expected. No mitigation is required.

b) Less Than Significant Impact. Construction of the Build Alternative may temporarily disturb soil outside the footprint of the road and structures but within the freeway rights-of-way, primarily in the trample zone around work areas, heavy equipment traffic areas, and material laydown areas. Construction activities in TCEs and staging areas outside the freeway right-of-way would also temporarily disturb soils in those areas. Excavated soil in construction areas would be exposed resulting in increased potential for soil erosion during construction compared to existing conditions. During a storm event, soil erosion could occur at an accelerated rate.

During all project construction activities, the construction contractor would be required to adhere to the requirements of the General Construction Permit and to implement erosion and sediment control BMPs specifically identified in the project Storm Water Pollution Prevention Plan to keep sediment from moving off site into receiving waters and impacting water quality in those waters. Erosion impacts related to water quality are specifically evaluated in Section 2.9, Water Quality, in this IS/EA. With implementation of Project Features PF-WQ-1 and PF-WQ-2, described in Section 2.9.3, during construction and operation of the Build Alternative and Project Feature PF-GEO-2, described in Section 2.10.3, which provides for revegetation of graded slopes and direct runoff, potential soil erosion impacts would be less than significant. No mitigation is required.

c) Less Than Significant Impact. The area along I-5 from north of the Yale Avenue Overcrossing to Peters Canyon Channel is reported to be a liquefaction zone. Based on preliminary calculations, the maximum liquefaction-induced settlement within this area is expected to be less than two inches. As a result, project improvements on this segment of I-5 would be potentially subject to effects related to liquefaction, lateral spreading, and seismic settlement. With design and construction of the project improvements in the Build Alternative consistent with the Caltrans *Highway Design Manual* (2016), other required standards, and recommendations from the Geotechnical Investigation as discussed in Project Feature PF-GEO-1 (described in Section 2.10.3), potential effects of liquefaction, lateral spreading, and seismic settlement on the structures and facilities provided in the Build Alternative are less than significant, and no mitigation is required.

d) Less Than Significant Impact. Soils below the project Study Area from I-405 to the Yale Avenue Overcrossing and Peters Canyon Channel to the Tustin Ranch Road Overcrossing within the Study Area are considered to be expansive. Soil expansion potential would be further evaluated and recommendations for design identified as part of the Geotechnical Investigation as discussed in Project Feature PF-GEO-1 (Section 2.10.3). With compliance with the findings and recommendations summarized in the Geotechnical Investigation, potential impacts related to expansive soil are less than significant. No mitigation is required.

e) No Impact. The Build Alternative would not use septic tanks or alternative methods for disposal of wastewater into subsurface soils, and would not connect to existing public wastewater infrastructure. Therefore, the Build Alternative would not

result in impacts related to septic tanks or alternative wastewater disposal methods. No mitigation is required.

3.1.7 Greenhouse Gas Emissions

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Caltrans has used the best available information based to the extent possible on scientific and factual information, to describe, calculate, or estimate the amount of greenhouse gas emissions that may occur related to this project. The analysis included in the climate change section of this document provides the public and decision-makers as much information about the project as possible. It is Caltrans' determination that in the absence of statewide-adopted thresholds or GHG emissions limits, it is too speculative to make a significance determination regarding an individual project's direct and indirect impacts with respect to global climate change. Caltrans remains committed to implementing measures to reduce the potential effects of the project. These measures are outlined in the climate change section that follows the CEQA checklist and related discussions.			
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				

Please refer to Section 3.2, Climate Change, for a discussion of greenhouse gas emissions.

3.1.8 Hazards and Hazardous Materials

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Hazards and Hazardous Materials

The potential for the proposed project to result in significant impacts related to hazards and hazardous materials was assessed in the Initial Site Assessment (ISA, October 2017), and in Section 2.12, Hazardous Waste/Materials, of this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. During construction, there is the potential to encounter hazardous materials in soils and existing road and structures materials. Construction of the Build Alternative would disturb soils, demolish existing buildings and structures, and remove pavement markings. As a result, contaminants such as aerially deposited lead (ADL) and structural materials (polychlorinated biphenyls, lead chromate, lead-based paint [LBP], and asbestos-containing material [ACM]) may be encountered during construction.

Typical hazardous materials anticipated to be used during construction of the Build Alternative (e.g., solvents, paints, fuels) and hazardous wastes generated during construction would be handled in accordance with applicable federal and State regulations and Caltrans policies regarding the use, storage, handling, disposal, and transport of these materials.

Project Features PF-HAZ-1 through PF-HAZ-6 in Section 2.12.3 describe required further testing and proper handling of hazardous waste and materials and will be adhered to during construction. With implementation of these measures, potential impacts related to hazardous materials would be less than significant.

Routine maintenance activities during operation of the Build Alternative would comply with applicable regulations with respect to the use, storage, handling, transport, and disposal of potentially hazardous materials. Operation of the Build Alternative would not result in a significant permanent impact related to the transport or emissions of hazardous waste or materials. No mitigation is required.

b) Less Than Significant Impact. The Build Alternative would not create a substantial hazard to the public or the environment through any reasonably foreseeable upset or accident conditions involving the release of hazardous materials. As discussed in Response 3.1.8 a) above, routine hazardous materials such as paint, solvents, and fuel would be used, handled, stored, disposed of, and transported during construction of the Build Alternative in accordance with applicable local, State, and federal regulations. During operation of the Build Alternative, transport of hazardous materials is subject to strict regulation. Caltrans, the California Highway Patrol, and local police and fire departments are trained in emergency response procedures for safely responding to accidental spills of hazardous substances on public roads, which further reduces impacts. Hence, operation of the Build Alternative would not result in a significant permanent impact related to transport or upset of hazardous waste and materials. No mitigation is required.

c) Less Than Significant Impact. The following schools are located within 0.25 mi of the alignment of the Build Alternative: Sisters of the Company of Mary Lestonnac at 16791 E Main Street, Tustin; Benjamin F. Beswick Elementary at 1362 Mitchell Avenue, Tustin; Tustin High School at 1171 El Camino Real, Tustin; Marjorie Veeh Elementary School, 1701 San Juan Street, Tustin; C.E. Utt Middle School at 13601 Browning Avenue, Tustin; Arnold O. Beckman High School at 3588 Bryan Avenue, Irvine; Irvine High School at 4321 Walnut Avenue, Irvine; and LePort Montessori

Schools – Irvine Spectrum Campus at 1 Technology Drive, Irvine. No schools are known to be planned within 0.25 mi of the alignment of the Build Alternative. As discussed in Responses 3.1.8.1 a) and b) above, routine hazardous materials such as paint, solvents, and fuel would be used, handled, stored, disposed of, and transported during construction of the Build Alternative in accordance with applicable local, State, and federal regulations. Also as previously discussed, operation of the Build Alternative does not involve the reasonably foreseeable potential for release of hazardous emissions or handling of acutely hazardous materials, as transport of hazardous materials is subject to strict regulation. Refer also to Responses 3.1.8 a) and b) above. Routine maintenance activities during operation of the Build Alternative would comply with applicable regulations with respect to the use, storage, handling, transport, and disposal of potentially hazardous materials. Therefore, operation of the Build Alternative would result in less than significant impacts related to the emissions or handling of hazardous waste or materials near existing or proposed schools. No mitigation is required.

d) Less Than Significant Impact. One parcel identified for partial acquisition and one parcel identified as a TCE under Build Alternative are included on the Cortese List pursuant to Government Code Section 65962.5. In addition, one parcel adjacent to the project area will be acquired for partial acquisition and may contain residual contamination from past agricultural uses. Four parcels located in the vicinity of the maximum disturbance limits of the Build Alternative were identified as containing contaminated groundwater and soil. A Site Investigation will be required on those parcels to identify potential hazards that may occur during project construction as specified in Project Features PF-HAZ-5 and PF-HAZ-6. With implementation of Project Features PF-HAZ-4 through PF-HAZ-6, impacts related to contaminated soil and groundwater would be less than significant. In addition, as specified in Project Features PF-HAZ-1 through PF-HAZ-3, ADL, ACM, and LBP surveys would be required for existing structures, as well as soil sampling for pesticides on the former agricultural properties. With implementation of these features, potential impacts related to hazardous material sites would be less than significant.

e) No Impact. The closest public use airport to the project site is the John Wayne Airport (JWA), which is 6 mi east of the project site. Due to the distance of this airport from the Build Alternative and the Build Alternative's inapplicability to an airport land use plan, implementation of the Build Alternative would not result in a safety hazard for people working or residing in the Study Area. No mitigation is required.

f) No Impact. There are no private airports or airstrips in the vicinity of the project limits. As a result, the Build Alternative would not affect or be affected by aviation activities associated with private airports or airstrips. No mitigation is required.

g) Less Than Significant Impact. As described in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, the construction of the Build Alternative would result in temporary impacts to traffic circulation, and pedestrian and bicycle access in the vicinity of the project limits. Those impacts could include short-term closures of freeway and arterial facilities and modifications to the existing facilities as described in detail in Section 2.5. The temporary closures and detours may result in short-term effects on emergency response and evacuation along and in the vicinity of the project limits and arterials in the vicinity of I-5. Specifically, emergency responders would need to use designated detour routes to get around freeway ramp or lane closures or lane reductions on arterials at their crossings of I-5. This could result in increased travel times for emergency service providers. Similarly, in the event evacuations are required during the temporary facility closures or lane reductions, there could be delays for traffic evacuating from the area due to the detours and/or temporary reduction in the available road capacity. Project Feature PF-T-1, provided in Section 2.5.3, requires the preparation prior to construction and implementation during construction of a Transportation Management Plan (TMP). The TMP would specifically address requirements for coordination with emergency service providers and accommodation of emergency travel routes and access to, through, and around active construction areas. With implementation of this project feature, potential impacts related to emergency response times and plans would be less than significant.

h) No Impact. Wildland fires occur in geographic areas that contain the types and conditions of vegetation, topography, weather, and structure density susceptible to risks associated with uncontrolled fires that can be started by lightning, improperly managed camp fires, cigarettes, sparks from automobiles, and other ignition sources. The project limits and the surrounding areas are developed in urban and suburban uses and do not include brush- and grass-covered areas typically found in areas susceptible to wildfires. As a result, the Build Alternative would not expose people or structures to a significant risk of loss, injury, or death associated with wildland fires. No mitigation is required.

3.1.9 Hydrology and Water Quality

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determination for Hydrology and Water Quality

The potential for the Build Alternative to adversely impact hydrology and water quality was assessed in the Water Quality Assessment Report (WQAR, April 2017), the Location Hydraulic Study (LHS, March 2017), Section 2.8, Hydrology and Floodplains, and Section 2.9, Water Quality and Storm Water Runoff, of this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. During construction of the Build Alternative, excavated soil would be exposed and there would be an increased potential for soil erosion compared to existing conditions. The total disturbed areas under Alternative 2A and Alternative 2B (Preferred Alternative) would be 173.4 ac and 133 ac, respectively. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), concrete-related waste, sanitary waste, and trash and debris may be spilled or leaked during construction with the potential for those pollutants of concern to be transported via storm runoff into receiving waters. Project Feature PF-WQ-2, provided in Section 2.9.3, requires the design, implementation, and maintenance of construction BMPs that will address the potential effects of soil erosion and pollutants of concern on receiving waters. Construction of the Build Alternative would also be required to comply with the requirements of the applicable National Pollutant Elimination System (NPDES) permit. Based on compliance with Project Feature PF-WQ-1 and the NPDES permit requirements, water quality impacts during construction of the Build Alternative are less than significant. No mitigation is required.

Alternative 2A and Alternative 2B (Preferred Alternative) would result in permanent increases in impervious surface area by 22.3 ac and 15.3 ac, respectively, compared to the existing freeway facility. An increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters. As shown in Project Features PF-WQ-1, PF-WQ-3, and PF-WQ-4 in Section 2.9.3, the operation of the Build Alternative would be required to comply with the Caltrans Statewide Storm Water Management Plan (SWMP) and follow the procedures outlined in the Caltrans *Storm Water Quality Handbooks, Project Planning and Design Guide for implementing Design Pollution Prevention and Treatment BMPs* (July 2010). This would include coordination with the Santa Ana RWQCB with respect to feasibility, maintenance, and monitoring of Treatment BMPs as set forth in the Caltrans Statewide SWMP. Based on compliance with these Caltrans requirements as shown in Project Features PF-WQ-1, PF-WQ-3, and

PF-WQ-4, no adverse water quality impacts are anticipated during operation of the Build Alternative.

b) Less Than Significant Impact. Dewatering may be required during construction of the Build Alternative. If groundwater dewatering becomes necessary during construction, the Build Alternative would be required to comply with a groundwater dewatering permit as described in Project Feature PF-WQ-2, which requires monitoring the discharges from groundwater extraction waste from construction to ensure that groundwater effluent that is pumped and ultimately discharged to surface waters does not exceed surface water effluent limitations for particular pollutants. Therefore, it is not anticipated that surface water would be impacted during construction activities as a result of site dewatering, as long as the groundwater discharge meets the RWQCB dewatering permit requirements.

c) and d) Less Than Significant Impact. During construction of the Build Alternative, construction activities would occur in the El Modena-Irvine Channel and the Peters Canyon Wash; and near Central Irvine Channel, Marshburn Channel, Bee Canyon Wash, and Agua Chinon Wash. All drainages in the Study Area crossed by I-5, with the exception of a downstream portion of Peters Canyon Wash, are concrete-lined with little or no vegetation. There are no natural drainages within the disturbance limits of the Build Alternative. Erosion during construction and operation of the Build Alternative would be addressed based on compliance with the applicable NPDES permit and Project Features PF-WQ-1 through PF-WQ-5. Additionally, the Build Alternative does not introduce any improvements that would change channel hydraulics or increase the risk of flooding and inundation. Water surface elevation would change minimally and waters would remain within their respective channels. The Build Alternative would increase the water surface elevation by less than 0.1 ft. Therefore, the Build Alternative does not include drainage modifications that would result in substantial erosion, siltation, or flooding on or off the project site. No mitigation is required.

e) Less Than Significant Impact. The Build Alternative proposes to modify an existing transportation facility. The Build Alternative would not substantively increase the total impervious surface areas as noted in Response 3.1.9.1 a), above, and, therefore, would not increase peak storm flows such that they would impact downstream drainage facilities. Compliance with the requirements of the Caltrans NPDES permit, Project Features PF-WQ-1 and PF-WQ-2 will address any

incremental pollutant loading associated with the increased impervious surface areas in the Build Alternative. No mitigation is required.

f) Less Than Significant Impact. As discussed above, runoff associated with the Build Alternative would be treated to remove pollutants of concern as required in Project Features PF-WQ-1 and PF-WQ-2 in Section 2.9.3 in this IS/EA. In addition, refer to Responses 3.1.9.1 a) and 3.1.9.1 e), above. No substantial degradation to water quality would occur as a result of the Build Alternative.

g) No Impact. According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Nos. 06059C0273J, 06059C0281J, 06059C0284J, 06059C0292J, 06059C0315J, and 06059C0313J, the floodplains in the Study Area are the El Modena-Irvine Channel, Peter's Canyon Channel, Central Irvine Channel, Marshburn Channel, Bee Canyon Channel, and Agua Chinon Channel. The Build Alternative does not propose the construction of housing in a 100-year flood hazard area. Therefore, the Build Alternative would not result in impacts related to the placement of housing in the 100-year floodplain. No mitigation is required.

h) Less Than Significant Impact. The Build Alternative would include construction activities in the El Modena-Irvine Channel and the Peters Canyon Wash, and near Central Irvine Channel, Marshburn Channel, Bee Canyon Wash, and Agua Chinon Wash. The construction activities at El Modena-Irvine Channel and Peters Canyon Wash would not reduce or otherwise modify the flood storage capacity or flood flows in these two channels. As a result, construction activities under the Build Alternative would not result in temporary adverse impacts related to hydrology and floodplains.

Permanent improvements to the I-5 bridge over the El Modena-Irvine Channel would consist of widening the bridge above the channel and widening abutments outside the channel lining. No additional piles or other forms of channel-resisting structures would be constructed within the channel. The freeboard amount will be evaluated during final design to determine if it meets Orange County Public Works (OCPW) requirements, but the Build Alternative would increase surface water elevation by less than 0.1 ft, which would not exceed the 1 ft FEMA threshold. Permanent improvements to the I-5 bridge over Peters Canyon Wash would consist of the widening of the bridge and abutment structure outside of the channel lining. No additional piles or other forms of channel-restricting structures would be constructed within the channel, and the bridge over the wash would meet minimum OCPW

freeboard requirements. The Build Alternative would increase the water surface elevation by less than 0.1 ft, which would not exceed the 1 ft FEMA threshold.

The Build Alternative would also require the Central Irvine Channel reinforced-concrete box to be extended at its confluence with Peters Canyon Wash in order to support the widened I-5 crossing. Under Alternative 2A, the channel would be lengthened by approximately 22 ft, and under Alternative 2B (Preferred Alternative), the channel would be lengthened by approximately 18 ft. The I-5 bridge over Peters Canyon Wash, at the point where there is confluence with the Central Irvine Channel, would meet minimum OCPW freeboard requirements. The extension of the channel would not reduce the ability of the channel to convey the flood flow as the channel would only be extended and not change in size or shape. The base flood elevation would not increase more than 0.1 ft, below the 1 ft FEMA threshold.

The Bee Canyon Wash crosses under I-5 within a culvert. The upstream opening of the channel is within the Study Area, and the Build Alternative would extend the reinforced culvert, moving the culvert opening further upstream. The culvert extension would result in less than a 0.2 ft change in water surface elevation for the Build Alternative, less than the 1 ft FEMA threshold.

The Build Alternative would not affect or encroach on the Marshburn Channel and Agua Chinon Wash, and no change in surface elevation at these locations would occur.

In summary, there would be a minimal change in water surface elevation, base flood elevations, and base flood flow volumes and rates in the channels impacted by the Build Alternative. There is low potential for overtopping as a result of construction of the Build Alternative, and the OCPW freeboard requirement would be met by all channels with the exception of the El Modena-Irvine Channel. Freeboard for this channel will be calculated during final design and would not change determination of any analysis conducted. The floodplains for the six channels would remain within the channel lining for the Build Alternative, and improvements associated with the Build Alternative would result in minimal floodplain encroachments. The Build Alternative would not create a significant effect on channel hydraulics, and no mitigation would be needed to reduce effects.

i) Less Than Significant Impact. The Santa Ana River Project is an extensive system of dams, levees, and other components, which provides flood protection to San Bernardino, Riverside, and Orange Counties along the entire 75 mi length of the

Santa Ana River from its headwaters to the Pacific Ocean. Seven Oaks Dam and Prado Dam on the Santa Ana River are two major components of the Santa Ana River Project.

In the event one or both of those dams failed, the water in the reservoirs behind those dams would be released to the Santa Ana River. The release of that large a volume of water could result in flooding in low-lying areas in central and coastal Orange County. The nearest part of the project limits of I-5 to the Santa Ana River is approximately 4 mi west of I-5. Modifications to floodplain crossings would not result in more than a 0.1 ft change to the base flood elevation. As a result, the Build Alternative would not expose people or structures to a significant risk of loss, injury, or death as a result of flooding. No mitigation is required.

j) No Impact. The approximate midpoint of the project limits of I-5 is approximately 6 mi from the northernmost part of Upper Newport Bay, which drains to the Pacific Ocean. The Tsunami Map for Emergency Planning for the Newport Beach Quadrangle shows that the nearest tsunami inundation area to the project segment of I-5 is Upper Newport Bay. Based on the distance from the project improvements to Upper Newport Bay, there is no anticipated risk of inundation from a tsunami under the Build Alternative.

A seiche is a tsunami-like condition in an enclosed body of water like a lake or reservoir. The nearest enclosed bodies of water to the project limits are Upper Newport Bay and Prado Dam. Prado Dam is approximately 15 mi northeast of the northernmost part of the project limits. Based on the distances of I-5 to these two bodies of water, there is no anticipated risk of inundation from a seiche under the Build Alternative.

Mudflows occur when soil is saturated and flows downhill. There are no hills adjacent to or in the vicinity of the project limits. As a result, there is no anticipated risk to the Build Alternative as a result of a mudflow.

No mitigation is required.

3.1.10 Land Use and Planning

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Land Use and Planning

The potential for the Build Alternative to result in adverse impacts related to land use and planning was assessed in Sections 2.1, Land Use, and 2.3, Community Impacts, in this IS/EA. The following discussions are based on those analyses.

a) No Impact. The project limits are an existing freeway with interchanges/ramps, retaining walls, noise barriers, and other structural features. Existing land uses in the northern part of the Study Area include a mix of single and multifamily residential, commercial and services, industrial, education, and open space and recreation uses; and in the southern part of the Study Area include a mix of vacant spaces, open space and recreation, agricultural lands, and mixed commercial and industrial uses. Construction of the Build Alternative would require small TCEs in areas adjacent to commercial and residential areas along Jeffrey Road in the City of Irvine, near residential areas along Peters Canyon Road in the City of Irvine, and in commercial areas north of Jamboree Road in the City of Tustin. In addition, TCEs would be required adjacent to I-5 along El Camino Real and Nisson Road, both of which are frontage roads that provide access to residential areas. Because most of the TCEs would be on land currently being used for landscaping and parking lots adjacent to the existing I-5 right-of-way, the temporary use of such land for construction activities would not adversely affect community character, divide existing land uses or existing communities, or create barriers between existing communities. No mitigation is required.

b) No Impact. The Build Alternative is in the SCAG FTIP Projects Listing in the 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was found to conform to the SIPs by the FHWA and FTA on June 1 and 2, 2016. The Build Alternative is also included in the SCAG financially constrained 2017 FTIP (FTIP ID ORA130302), which was found to conform to the SIP by the FHWA and FTA on December 16, 2016. The design concept and scope of the Build Alternative are consistent with the Project Description in the 2016–2040 RTP/SCS and 2017 FTIP, and the traffic assumptions of SCAG’s regional emissions analysis. Thus, the Build Alternative is consistent with these regional and federal transportation plans.

The Build Alternative would be consistent with the goals and policies in the General Plans of the affected cities as detailed in Table 2.1.5. The Build Alternative would not change existing land use patterns along I-5 because I-5 is an existing transportation facility in a highly developed area, and the Build Alternative would result in a limited amount of property acquisition. The Build Alternative would not require amendment of the affected cities’ General Plans. Therefore, the Build Alternative is consistent with local plans and policies. No mitigation is required.

c) Less Than Significant Impact. As discussed earlier in Response 3.1.4.1 f) above, the Central/Coastal Subregion NCCP and HCP are applicable to the area within and in the vicinity of the BSA. Although the Build Alternative occurs within the Central/Coastal NCCP Subregion, Caltrans and OCTA did not contribute funding to the development of the NCCP/HCP and reserve system; therefore, they are considered to be non-participating landowners. However, the OCTA Measure M2 NCCP and HCP are applicable to the Build Alternative. The OCTA Measure M2 NCCP and HCP include measures to minimize take of identified species and their habitats. Avoidance and minimization of impacts on identified species and their habitats will be implemented through a process that verifies that construction activities undertaken as part of the Build Alternative adhere to a set of protection measures.

3.1.11 Mineral Resources

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Mineral Resources

The potential for the Build Alternative to result in adverse impacts related to mineral resources was assessed based on information from the Cities of Tustin and Irvine General Plans.

a) and b) No Impact. The City of Irvine General Plan (2012) does not discuss mineral resources or extraction activities. As a result, it is expected that there are no known mineral resources or extraction activities in the City of Irvine.

The only identified mineral resource in the City of Tustin is a mercury-barite deposit in an area referred to as Red Hill as discussed in the General Plan Conservation/Open Space/Recreation Element (City of Tustin 2008, page 40). Although the General Plan does not indicate the location of Red Hill, various sources indicate it is in the low foothills of the Santa Ana Mountains in the eastern part of the City. No extraction of this mineral resource is currently occurring.

As a result, the Build Alternative would not result in impacts on known mineral resources or resource extraction activities. No mitigation is required.

3.1.12 Noise

Would the project result in:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Noise

The potential for the Build Alternative to result in significant noise impacts was assessed in the Noise Study Report (NSR, June 2017), Noise Abatement Decision Report (NADR, October 2017), and Section 2.14, Noise, in this IS/EA. The following discussion is based on those analyses.

a) Less Than Significant Impact. Noise levels during construction of the Build Alternative may impact noise sensitive receptors. Typical construction noise levels may reach 86 A-weighted decibels (dBA) maximum instantaneous noise level (L_{max}) at a distance of 50 ft from the noise sources. The following minimization measure, described in detail in Section 2.14.4, would minimize construction noise impacts under the Build Alternative: Measure N-1: Compliance with the Caltrans Standard Specifications, Section 14-8.02, “Noise Control” during construction.

However, because the Build Alternative would not result in any substantial increases in permanent noise levels in the Study Area, no significant permanent noise impact would occur under CEQA. Noise abatement measures, including noise barriers, have been evaluated to minimize the noise impacts. With implementation of the noise abatement measures, the noise levels would be minimized. Therefore, long-term noise impacts as a result of the Build Alternative are considered less than significant.

b) Less Than Significant Impact. The closest sensitive receptors are approximately 50 ft from the construction areas for the Build Alternative. The use of a large bulldozer during construction of the Build Alternative would generate the highest vibration level of 0.089 peak particle velocity (PPV) inches per second (in/sec) at a distance of 25 ft.

The sensitive receptors may be subject to a ground-borne vibration level of 0.042 PPV (in/sec). This vibration level is considered distinctly perceptible to humans and would not result in community annoyance. In addition, this vibration level would be well below the damage threshold of 0.3 PPV (in/sec) for older residential structures and would not have the potential to damage nearby residential structures. In addition, compliance with local Noise Ordinances and the Caltrans Standard Specifications required in Project Feature PF-N-1 in Section 2.14 will also address vibration impacts. Therefore, groundborne vibration and noise impacts are considered less than significant.

Groundborne vibration from vehicles driving on the project facilities would not result in any measurable changes in vibration levels compared to the existing conditions. Therefore, vibration impacts are considered less than significant.

c) Less Than Significant. The noise level increases along I-5 during the operation of the Build Alternative as compared to existing Baseline conditions are shown in Tables J-1 through J-3 in Appendix J.

As indicated in Section 2.14.1.1, the CEQA noise analysis is a strictly baseline versus build comparison to determine if noise increases brought about by the Build Alternative are significant. It is independent of the 23 CFR 772 analysis contained in Section 2.14. Significance is determined by examining the setting of the noise impact and how large or perceptible any noise increase would be in the given area.

Considerations include the uniqueness of the setting, the sensitive nature of the noise receptors, the magnitude of the noise increase, number of residences affected, and the absolute noise level.

The receptor locations and modeled noise increases (Tables J-1 through J-3 located in Appendix J of this IS/EA) were examined to determine if the with-project worst-hour noise level was substantially higher than the existing Baseline condition. As an increase of 5 dBA generally represents a noticeable change in sound level, any modeled increase over 5 dBA was identified for a closer look. It should be noted that during the noise modeling, numerous receptor locations seemingly experienced a substantial increase in noise levels with the Build Alternative due to the demolition of noise barriers necessary for construction of the Build Alternative. However, these noise barriers would be reconstructed, at a minimum, the same height as the noise barriers that currently exist (and potentially taller if feasible and reasonable as defined by 23 CFR 772). Therefore, once the replacement noise barriers were constructed, the majority of the receptors that were identified as experiencing an increase in noise levels over the Baseline condition would experience an increase that would barely be perceptible to the human ear, generally ranging from 0 to 4 dBA. In some cases, receptors would experience a decrease in noise levels.

In two cases, perceptible (over 5 dBA) noise increases after construction of replacement noise barriers would occur under Alternative 2A. One of these increases would be located at Receptor No. 10.05 (depicted on Figure J-1, sheet 29 of 41), a daycare facility located on Walnut Avenue adjacent to the I-5 mainline. After replacement of the nearby noise barriers, the future With Project noise level would increase 7.7 dBA over the existing Baseline conditions. At Receptor No. 10.35, within a residential area on Topeka adjacent to the I-5 mainline (depicted on Figure J-1, sheet 30 of 41), the With Project noise level increase would be 6.2 dBA after abatement (in-kind noise barrier replacement of the existing wall). However, because these noise increases do not reach 12 dBA, generally accepted as being considered significant for the purposes of the CEQA analysis, with the noise barrier abatement incorporated these increases are determined to be less than significant and no mitigation is necessary.

d) Less Than Significant Impact. Refer to Response 3.1.12.a), above, which indicates that noise levels during construction of the Build Alternative may impact sensitive receptors, and with implementation of Project Feature PF-N-1, construction noise impacts under the Build Alternative would be less than significant.

e) No Impact. As discussed earlier, JWA is south and east of the northern terminus of the project limits. The Build Alternative would not result in any changes in the takeoff and landing patterns or total volumes of flights at JWA. As a result, the Build

Alternative would not expose people using I-5 or living or working in the areas surrounding I-5 to aviation-related noise levels different than would occur under existing conditions. Therefore, the Build Alternative would not result in aviation-related noise impacts. No mitigation is required.

f) No Impact. There are no private airports or airstrips in the vicinity of the project limits. As a result, the Build Alternative would not affect or be affected by aviation noise levels associated with private airports or airstrips. No mitigation is required.

3.1.13 Population and Housing

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Population and Housing

The potential for the Build Alternative to result in adverse impacts related to population and housing was assessed in the Sections 2.2, Growth, and 2.3, Community Impacts, in this IS/EA. The following discussions are based on those analyses.

a) No Impact. As discussed in detail in Section 2.2, the potential growth-related impacts of the Build Alternative were considered in the context of the first-cut screening analysis approach to assessing the potential for growth-inducing effects. That analysis determined that the Build Alternative would:

- Not provide new transportation facilities or create new access points to areas not previously accessible and, therefore, would not result in changes in accessibility to the transportation system in the area.
- Accommodate existing and planned growth and would not influence growth beyond what is currently planned.
- Would not influence growth beyond those projects that are currently planned for the area and would not change the rate, type, or amount of growth and reasonably foreseeable growth in the Cities of Santa Ana, Tustin, Irvine, and Lake Forest.

No mitigation is required.

b) and c) No Impact. Alternative 2A would result in the acquisition of five commercial units, and would not result in the displacement of any residents, or the need for replacement housing and, therefore, would not result in impacts related to population and housing. Alternative 2B (Preferred Alternative) would also not result in the acquisition of any residential units. No mitigation is required.

3.1.14 Public Services

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
i. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
v. Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Public Services

The potential for the Build Alternative to impact public services and facilities is assessed in Sections 2.1, Land Use, and 2.4, Utilities and Emergency Services, in this IS/EA. The following discussions are based on those analyses.

a) i) and ii) Less Than Significant Impact. Fire protection and emergency medical/paramedic services in the Cities of Tustin and Irvine are provided by the Orange County Fire Authority under contract to those cities. Police protection services in the Study Area are provided by the Cities of Tustin and Irvine Police Departments. As described earlier in the Response 3.1.16.1 a), construction of the Build Alternative would result in temporary impacts to traffic circulation. Those impacts could include short-term closures of freeway and arterial facilities and modifications to the existing facilities that could result in short-term effects on emergency response (fire and police) times in the vicinity of the project limits and arterials in the vicinity of I-5. Specifically, emergency responders would need to use designated detour routes to get around freeway ramp or lane closures or lane reductions on arterials at their crossings of I-5. This could result in increased travel times for those emergency service providers. Project Feature PF-T-1, provided in Section 2.5 in the IS/EA, requires the preparation prior to construction and implementation during construction of a TMP. The TMP will specifically address requirements for coordination with emergency service providers and accommodation of emergency travel routes and access to, through, and around active construction areas.

In the long term, the Build Alternative would reduce traffic congestion and result in decreased travel times on I-5 between I-405 and SR-55. These improvements in traffic flow are likely to improve emergency response times within the project limits. Therefore, operation of the Build Alternative would not result in adverse effects on the delivery of emergency services in the long term.

a) iii), iv), and v) Less Than Significant Impact. During construction of the Build Alternative, access to schools, parks, and other public and community facilities in the vicinity of the project limits would not be affected. Because potential overnight mainline, ramp, and arterial closures would occur outside the hours of operation for those community facilities, none of the community facilities would be adversely affected by travel delays or increased noise levels as a result of temporary overnight detours during construction. There are a select number of locations wherein ramp closures longer than overnight, but still short-term, would occur. These locations

include the northbound I-5 to Jamboree Road off-ramp (necessary under Alternative 2A only), the westbound Jamboree Road to northbound I-5 (necessary under both Alternatives 2A and 2B), the Tustin Ranch Road on-ramp to the Jamboree Road off-ramp along I-5 (a full short-term closure of the Tustin Ranch Road on-ramp would occur under both Alternatives 2A and 2B), and the off-ramp to Newport Avenue from the SR-55 connector (a full short-term closure would occur under Alternative 2A only). These short-term closures that exceed overnight in duration may temporarily impact access to community facilities in the vicinity of these ramps; however, the TMP described earlier would further minimize traffic-related impacts during construction. No mitigation is required.

The Build Alternative would not result in direct or indirect adverse visual/aesthetic, air quality, water quality, or noise effects on schools, parks, and the other community facilities in the vicinity of the project limits. No mitigation is required.

3.1.15 Recreation

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Recreation

The potential for the Build Alternative to adversely impact recreation resources was assessed in Section 2.1, Land Use, in this IS/EA. The following discussions are based on the findings of that analysis.

a) Less than Significant Impact. The Build Alternative proposed modifications to the existing I-5 freeway mainline, ramps, and arterial interchanges to accommodate existing and projected growth within the region. As a result, Alternative 2A would

result in a small acquisition on the eastern property boundary of Heritage Park and a small permanent easement at Orchard Park. A minor acquisition would occur on the eastern boundary of Heritage Park and the permanent easement would occur on the western boundary of Orchard Park. These minor acquisitions/easements would occur on a small amount of the respective total park acreages, and none of the activities, attributes or features of the park would be impaired. Alternative 2B (Preferred Alternative) would not require these minor acquisitions/easements to Orchard Park and/or Harvard Park. The Build Alternative would not result in the construction of residential or other land uses that would attract visitors to parks in the cities adjacent to the project limits or to regional parks and other recreation facilities. As a result, the Build Alternative would not result in increased demand for those resources and, therefore, would not contribute to substantial or accelerated deterioration of those facilities. No mitigation is required.

b) No Impact. The Build Alternative does not include the construction of new recreational facilities or require the expansion of existing recreational facilities. Therefore, the Build Alternative would not result in adverse effects related to constructing new or expanded recreation facilities. No mitigation is required.

3.1.16 Transportation/Traffic

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Transportation/Traffic

The potential for Build Alternative to result in adverse traffic impacts was assessed in the *Final Traffic/Circulation Impact Report* (January 2017) and in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, in this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. Construction of the Build Alternative would temporarily impact traffic circulation and pedestrian and bicycle access in the vicinity of the project limits. Those impacts could include short-term closures of freeway and arterial facilities and modifications to the existing facilities. Temporary closures would be limited to overnight (between 10:00 p.m. and 5:00 a.m.) with limited durations of two to ten days. Temporary modifications to the freeway mainline, connector and ramp facilities, and arterial streets could include narrowing the widths of the travel lanes and shoulders, and reductions in the number of available travel lanes and speed limits. These temporary modifications would allow for traffic to pass through the project limits on I-5, the ramps, and the arterials, but those travelers would be expected to experience some delays as they travel on those facilities. Alternative 2A would require short-term ramp closures at the westbound Jeffrey Road to the northbound I-5 on-ramp, the northbound I-5 off-ramp to Jamboree Road,

westbound Jamboree Road to the northbound I-5 on-ramp, Red Hill Avenue to the northbound I-5 on-ramp, Tustin Ranch Road to the southbound I-5 on-ramp, and the Newport Avenue off-ramp from southbound SR-55 to the southbound I-5 connector. Alternative 2A would also require full nighttime closures on I-5 at Alton Parkway and Jeffrey Road. Alternative 2B (Preferred Alternative) would require short-term closures at westbound Jeffrey Road to the northbound I-5 on-ramp, westbound Jamboree Road to the northbound I-5 on-ramp, and Tustin Ranch Road to the southbound I-5 on-ramp. Most of the interchange ramps are expected to be open during construction, with periodic closures at night or for a period of less than 10 days. No two consecutive on- or off-ramps in the same direction would be closed at the same time to minimize inconvenience to the traveling public.

The temporary closures of arterial roads would include closure of the sidewalks along those roads at their I-5 crossings. The detours for vehicular traffic to travel around the closed arterials would also be signed for use by pedestrians and bicyclists. As a result, pedestrians and bicyclists who use those arterials would be required to travel north or south of the closed arterial to reach the closest I-5 open arterial crossing. This would result in a longer travel path for both pedestrians and bicyclists and would substantially increase their travel times. However, the arterials would be closed only overnight and for very limited periods, which would minimize the effects of the closures on pedestrians and bicyclists.

Pedestrians and bicyclists are not allowed to travel on the I-5 mainline or ramps. The temporary mainline and ramp closures and the temporary detours associated with those closures would not affect the existing Class I bike paths in the vicinity of the proposed project. The temporary arterial closures and the temporary detours associated with those closures would not affect the existing Class I bike paths in the vicinity of the proposed project. As a result, those closures under the Build Alternative would not impact those Class I bike paths and the pedestrians and bicyclists using those bike paths.

The temporary impacts on motorists, pedestrians, and bicyclists would be addressed based on implementation of the TMP during construction as required in Project Feature PF-T-1. The TMP would address short-term traffic and transportation impacts during construction. No mitigation is required.

Tables 2.5-3 through 2.5-12 in Section 2.5 of this IS/EA show the levels of service for the Build Alternative and the No Build Alternative in the AM and PM peak hours

under the existing condition, 2030, and 2050. As shown, for most segments and ramps, the Build Alternative performs better than the No Build Alternative for these performance measures in both 2030 and 2050. Ramp storage at one location (Sand Canyon Avenue southbound off-ramp) is projected to exceed capacity when compared to both the No Build Alternative as well as to the existing Baseline conditions, based on the *Highway Capacity Manual* (HCM 2010) methodology. To address this inadequate capacity, a mitigation measure is proposed that would change the configuration of the off-ramp from its current configuration (two dedicated left-turn lanes, one shared left- and right-turn lane, and one dedicated right-turn lane) to one dedicated left-turn lane, one shared left- and right-turn lane, and two dedicated right-turn lanes. This configuration would occur as part of the Build Alternative; therefore, no impact would occur and no mitigation is required.

The Build Alternative is consistent with the applicable local General Plans and regional transportation plans to reduce congestion and improve operation within the project limits. In addition to the improvements on the I-5 mainline and ramps, the Build Alternative includes design features to improve the intersections between the freeway ramps and the local arterial streets including accommodating pedestrians, bicycles, and mass transit. No mitigation is required.

b) Less Than Significant. In Opening Year 2030, a total of 25 Study Area intersections are projected to operate at Level of Service (LOS) E or F during one or both peak periods under the Build Alternative, according to the HCM 2010 methodology. When compared to the 2030 No Build Alternative, five intersections would experience an improvement in LOS in one or both peak periods under the Build Alternative, and two locations were identified where a minor degradation in LOS would be experienced (the intersections of Tustin Ranch Road/I-5 southbound ramps and Red Hill Avenue/I-5 northbound ramps). However, neither of these two locations would reach LOS E or F and would, therefore, not be substantially impacted. However, when compared to existing Baseline conditions, 15 total intersections under the Build Alternative would be degraded to an LOS E or F in 2030 according to HCM 2010 methodology. Given that under the 2030 No Build Condition, 26 intersections would operate at LOS E or F under HCM, this degradation cannot be attributed to the Build Alternative.

According to Intersection Capacity Utilization (ICU) methodology, five intersections would operate at LOS E or F in either of the peak periods under the Build Alternative in 2030. When compared to the 2030 No Build Alternative, no intersections evaluated

under the ICU methodology were identified as having an improvement in LOS that would elevate an intersection operating at LOS E or F to an acceptable LOS. Five intersection locations were identified as being degraded from an acceptable LOS to an unacceptable LOS in 2030 when comparing the existing Baseline conditions to the 2030 Build Alternative. As the 2030 No Build Alternative indicates that five intersections would operate at LOS E or F under ICU, this degradation cannot be attributed to the Build Alternative.

In Design Year 2050, a total of 27 Study Area intersections are projected to operate at LOS E or F in one or both peak periods per HCM methodology. Compared to the 2050 No Build Alternative, five intersection locations would experience an improvement in LOS in one or both peak periods under the Build Alternative. Similar to conditions projected for 2030, there are locations in which LOS would be degraded, but at none of these locations would LOS be degraded to such a degree that an intersection operating at an acceptable LOS under the 2050 No Build Alternative would operate at an unacceptable LOS under the Build Alternative. When compared to existing Baseline conditions, there are 17 locations at which LOS would be degraded to an unacceptable LOS. These areas of degradation should not be attributed to the Build Alternative, as the 2050 No Build Alternative indicates that 31 intersections would operate at LOS E or F under HCM.

According to ICU methodology, six intersections are projected to operate at an unacceptable LOS in 2050 under the Build Alternative. However, when compared to the 2050 No Build Alternative, one intersection (Jamboree Road/El Camino Real) would experience an improvement in LOS, from LOS E to LOS D. When compared to the existing Baseline conditions, six intersections evaluated under the ICU methodology are projected to experience degradation to an unacceptable LOS. These six locations of degradation should not be attributed to the Build Alternative, as the 2050 No Build Alternative indicates that seven intersections would operate at LOS E or F under ICU.

Because the Build Alternative would not exceed the LOS E standard in the Congestion Management Plan (CMP), they would not conflict with the Orange County CMP. No mitigation is required.

c) No Impact. The Build Alternative consists of roadway and freeway interchange improvements. The Build Alternative would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that

results in substantial safety risks. Therefore, no impacts would occur and no mitigation is required.

d) Less Than Significant Impact. The Build Alternative would be designed, constructed, and operated consistent with the Caltrans *Highway Design Manual* and other applicable standards and specifications for freeways, ramps, arterial intersections, retaining walls, noise barriers, drainage features, and utility relocations/modifications. The Build Alternative would not include hazardous design features. Farm equipment, pedestrians, and bicyclists would not be allowed to operate on the I-5 mainline and ramps. Therefore, the Build Alternative would not include any hazardous design features or incompatible uses. No mitigation is required.

e) Less Than Significant Impact. As described earlier in Responses 3.1.14.1 a) i) and 3.1.14.1 a) ii), construction of the Build Alternative would result in temporary impacts to traffic circulation including emergency services. Those impacts will be addressed based on implementation of the TMP during construction required in Project Feature PF-T-1. The TMP would specifically address requirements for coordination with emergency service providers and accommodation of emergency travel routes and access to, through, and around active construction areas. No mitigation is required.

In the long term, the Build Alternative would reduce traffic congestion and travel times on I-5 between I-405 and SR-55. The improvements in the Build Alternative are likely to improve emergency response times on I-5. Therefore, the Build Alternative would not result in adverse effects on the delivery of emergency services in the long term.

f) Less Than Significant Impact. As discussed in the Section 2.1, Land Use, in this IS/EA, the Build Alternative would not conflict with adopted policies, plans, or programs supporting alternative transportation modes. The design of the freeway and ramp improvements in the Build Alternative would accommodate public and private buses. The improvements to arterials at their crossings of I-5 would be designed to accommodate transit vehicles, pedestrians, and bicyclists. The arterial improvements would also include features consistent with Americans with Disabilities Act requirements. As a result, the Build Alternative would not conflict with alternative transportation modes. No mitigation is required.

3.1.17 Tribal Cultural Resources

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Tribal Cultural Resources

The potential for the Build Alternative to adversely impact Tribal Cultural Resources was assessed in the HPSR (2017), the attachments to the HPSR, Section 2.7, Cultural Resources; and by adhering to AB 52. AB 52 went into effect on July 1, 2015, proposing to include tribal cultural resources in the CEQA analysis, and introducing a new class of resources: Tribal Cultural Resources. The California Office of Administrative Law approved the changes to the CEQA Checklist to incorporate the Tribal Cultural Resources Questions on September 27, 2016. The Build Alternative is subject to the requirements of AB 52, the CEQA Tribal Consultation law. As such, in addition to the initial Native American coordination, consultation under AB 52 was subsequently conducted by Caltrans on February 23, 2017. No initial response from the tribes was received as a result of the project notification letter. The tribes and representatives contacted include the Gabrieleno Band of Mission Indians – Kizh Nation (Andrew Salas), Gabrieleno/Tongva San Gabriel Band of Mission Indians (Anthony Morales), Gabrielino/Tongva Nation (Sandonne Goad), Gabrielino Tongva Indians of California Tribal Council (Robert F. Dorame), Gabrieleno-Tongva Tribe (Linda Candelaria), Juaneno Band of Mission Indians (Sonia Johnston), Juaneno

Band of Mission Indians Acjachemen Nation – Belardes (Matias Belardes and Joyce Perry), and Juaneno Band of Mission Indians Acjachemen Nation – Romero (Teresa Romero). A follow-up email was sent to the tribes. The only responses received from the tribal contacts were from Andrew Salas and Joyce Perry. Mr. Salas indicated that the Build Alternative is located within the group’s traditional ancestral area and is considered sensitive for cultural resources, and requests monitoring by one of their qualified tribal monitors and an archaeologist. Mr. Salas did not respond to a follow-up email sent on March 14, 2017, asking for specific areas of concern where cultural resources could be affected. Ms. Perry requested records search results prior to commenting, which were provided via email. In response, Ms. Perry stated they have no concerns at the current time, but that they would like to be notified of any inadvertent discoveries. Further detail of the tribal coordination process subject to the requirements of AB 52 can be found in Chapter 4, Comments and Coordination.

a) and b) Less Than Significant Impact. The 2017 HPSR determined that all the State-owned resources (built environment and archaeological resources) within the project APE are exempt from evaluation because they meet the criteria set forth in the Section 106 PA Attachment 4 (Properties Exempt from Evaluation) or were previously determined not eligible for inclusion in the National Register and/or registration as a California Historical Landmark. Caltrans has determined a finding of no impact is appropriate because there are no historical resources within the APE, or there are no impacts to historical resource(s), pursuant to the *State CEQA Guidelines* 15064.5(b)(3).

In the event that previously unknown buried cultural materials and human remains are encountered during construction, with compliance with Project Features PF-CR-1 and PF-CR-2 provided in Section 2.7, potential impacts to previously unknown cultural resources would be less than significant.

3.1.18 Utilities and Service Systems

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Utilities and Service Systems

The potential for the Build Alternative to adversely impact utilities and service systems was assessed in the Section 2.4, Utilities and Emergency Services, in this IS/EA. The following discussions are based on those analyses.

a), b), and e) Less Than Significant Impact. The Build Alternative would not generate wastewater or discharge wastewater to the area sewer system. As a result, the Build Alternative would not exceed wastewater treatment requirements, require or result in the construction of new wastewater treatment facilities, or result in the need for a determination by a wastewater treatment provider that it has adequate capacity to serve the proposed project. No mitigation is required.

c) Less Than Significant Impact. Refer to Responses 3.1.9.1 c), 3.1.9.1 d), and 3.1.9.1 e) in Section 3.1.9, Hydrology and Water Quality, for discussion of the existing storm water drainage facilities that would be extended or modified to accommodate the widened freeway and modified ramp facilities under the Build Alternative. Those modifications would not require the construction of new storm

water drain facilities or substantial increases in the capacity of the existing storm drain facilities. No mitigation is required.

d) Less Than Significant Impact. The use of water during project construction would be limited to water trucked to the site for dust control. The amount of water used during construction would be minimal. The use of water during operation of the Build Alternative would be limited to areas in which new landscaping requires short-term watering while the plant material becomes established and areas in which limited use of water for landscaping requires permanent watering. The amount of landscaping provided in the Build Alternative would not differ substantially from the existing amount of landscaping in the limits of I-5 and, therefore, the amount of water needed for landscaping would be approximately the same as the existing demand. As a result, the Build Alternative would not require the water districts serving the Study Area to provide new or expanded entitlements to meet the need for water during construction and operation of the Build Alternative.

f) Less Than Significant Impact. During construction of the Build Alternative, two types of waste materials would be collected: vegetation, other plant material, and some excess soils; and solid waste such as concrete, asphalt, and wood. The waste collected during construction would be properly disposed of at an existing landfill or recycled. The amount of waste that would be generated during the construction of the Build Alternative would be limited and would occur only during the construction period. That amount of waste would be only a very small amount of the total waste disposed of or recycled at area recycling facilities and landfills, on both a daily and annual basis. Therefore, the amount of waste generated during construction of the Build Alternative is anticipated to be accommodated by the existing recycling and landfill facilities in Orange County.

The waste collected during operation of the Build Alternative would be properly disposed of at an existing landfill or recycled. The amount of waste that would be generated during the operation of the Build Alternative would be only a very small amount of the total waste disposed of or recycled at area recycling facilities and landfills, on both a daily and annual basis. Therefore, the amount of waste generated during operation of the Build Alternative is anticipated to be accommodated by the existing recycling and landfill facilities in Orange County.

Because the amount of waste generated during construction and operation of the Build Alternative is anticipated to be accommodated by the existing recycling and landfill facilities in Orange County, no mitigation is required.

g) Less Than Significant Impact. Any hazardous waste generated during construction of the Build Alternative, collected during normal waste collection activities, or collected as a result of an accidental release on the I-5 freeway or ramp facilities would be collected, handled, transported, and disposed of consistent with applicable federal, State, regional, and local regulations. Hazardous wastes would not be comingled with greenwaste nonhazardous trash. No mitigation is required.

Waste materials generated during construction and operation of the Build Alternative would be disposed of in accordance with federal, State, and local regulations related to recycling, which would minimize the amount of waste material entering local landfills. No mitigation is required.

3.1.19 Mandatory Findings of Significance

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Mandatory Findings of Significance

a) Less Than Significant Impact. The potential for the Build Alternative to result in significant impacts to biological or cultural resources, specifically, is discussed in Sections 2.7, 2.10, 2.11, 2.15, 2.16, 2.17, and 2.18 in this IS/EA. The Build Alternative would not degrade the quality of the environment or permanently impact any animal or plant species or associated habitat. The potential for temporary construction-related impacts to habitats for Western Pond Turtle, bobcat and coyote movement corridors, nesting birds protected under the Migratory Bird Treaty Act and the California Fish and Game Code, and protected bat species including the western yellow bat and the hoary bat will be avoided, minimized, and/or mitigated to a level below significance. The Build Alternative would result in only minimal impacts to areas under the jurisdiction of the CDFW, the RWQCB, and the USACE but would not impact any wetlands.

Based on the results of the HPSR (2017) and the attachments to that report, it was determined that the cultural resources within the APE do not appear to be eligible for inclusion in the National Register, do not qualify as historical resources pursuant to CEQA, or are exempt per the Section 106 PA. In addition, it has been determined that a Finding of No Historic Properties Affected is appropriate because there are no historical resources within the APE or there are no impacts to historical resources pursuant to *State CEQA Guidelines* Section 15064.5(b)(3). However, there is the potential to encounter unknown buried cultural resources or archaeological materials within the project disturbance limits during construction of the Build Alternative. In the event that previously unknown buried cultural materials are encountered during construction, compliance with Project Feature PF-CR-1, provided in Section 2.7, will address potential impacts to previously unknown cultural resources.

To avoid impacts to paleontological resources that may be present where excavation may occur in areas of undisturbed soils, a PMP, detailed in Measure PAL-1, provided in Section 2.11 of this IS/EA, would be developed during the final design phase of the project and implemented during the construction phase of the project. The potential to impact subsurface prehistoric resources will be addressed with implementation of Project Features PF-CR-1 and PF-CR-2, provided in Section 2.7 of this IS/EA.

b) Less Than Significant Impact. As discussed in Section 2.20, Cumulative Impacts, in this IS/EA, several transportation projects may be under construction and

operation at the same time as the Build Alternative. However, the Build Alternative would result in improved operating conditions along I-5 within the project limits compared to the No Build Alternative, and would not contribute to cumulative adverse effects to other resource areas. Therefore, the impacts of the Build Alternative are not considered cumulatively considerable and are less than significant.

c) Less Than Significant Impact. As discussed in Sections 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.9, 2.10, 2.12, 2.13, and 2.14, in this IS/EA, the Build Alternative would not result in environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. Furthermore, the Build Alternative would reduce traffic congestion and travel times on the I-5 between I-405 and SR-55. This would reduce traffic delay, thereby reducing travel time and improving the human environment.

3.2 Climate Change

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 (GHG) 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 (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation.¹ In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest

¹ United States Environmental Protection Agency. 2017. U.S. Greenhouse Gas Inventory Report: 1990–2014 (last updated February 23, 2017). Website: <https://www.epa.gov/ghg-emissions/us-greenhouse-gas-inventory-report-1990-2014>.

contributors of GHG emissions.¹ The dominant GHG emitted is CO₂, mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: “greenhouse gas mitigation” and “adaptation.” “Greenhouse gas mitigation” is a term for reducing GHG emissions to reduce or “mitigate” the impacts of climate change. “Adaptation” refers to planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).

3.2.1 Regulatory Setting

This section outlines federal and State efforts to comprehensively reduce GHG emissions from transportation sources.

Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.² This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of

¹ California Air Resources Board (ARB). 2017. California Greenhouse Gas Emission Inventory. 2017 Edition. Website: <https://www.arb.ca.gov/cc/inventory/data/data.htm>.

² Federal Highway Administration (FHWA). 2017. Sustainability (last updated October 19, 2017). Website: <https://www.fhwa.dot.gov/environment/sustainability/resilience/>.

sustainability.”¹ Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors 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.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

The Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of this Program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer’s average fuel economy for the portion of its vehicles produced for sale in the United States.

¹ FHWA. Sustainable Highways Initiative. Website: https://www.sustainablehighways.dot.gov/overview.aspx_

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 *Federal Register* 52117 (October 8, 2009): This federal EO set sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. It instituted as policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities.

Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, 80 *Federal Register* 15869 (March 2015): This EO reaffirms the policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities. It sets sustainability goals for all agencies to promote energy conservation, efficiency, and management by reducing energy consumption and GHG emissions. It builds on the adaptation and resiliency goals in previous executive orders to ensure agency operations and facilities prepare for impacts of climate change. This order revokes Executive Order 13514.

The EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs 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 EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

The EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010¹ and significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon (mpg) by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 mpg by 2025. Because NHTSA cannot set standards beyond model year 2021

¹ Center for Climate and Energy Solutions. Regulating Power Sector Carbon Emissions. Website: <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>.

due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which NHTSA, EPA, and ARB will decide on CAFE and GHG emissions standard stringency for model years 2022–2025. NHTSA has not formally adopted standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 mpg by 2025 was appropriate. In March 2017, President Trump ordered the EPA to reopen the review and reconsider the mileage target.¹

NHTSA and EPA issued a Final Rule for “Phase 2” for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO₂ emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

Presidential Executive Order 13783, *Promoting Energy Independence and Economic Growth*, of March 28, 2017: This EO orders all federal agencies to apply cost-benefit analyses to regulations of GHG emissions and evaluations of the social cost of carbon, nitrous oxide, and methane.

State

With the passage of legislation including State Senate and Assembly Bills and Executive Orders, California has been innovative and proactive in addressing GHG emissions and climate change.

Assembly Bill 1493, Pavley Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California ARB to develop and implement regulations to reduce automobile and light truck GHG 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 EO is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and

¹ NBC News. 2017. Websites: <http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256>; and Federal Register 14671. Website: <https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse>.

(3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of AB 32 in 2006 and SB 32 in 2016.

Assembly Bill 32 (AB 32), Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

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

Executive Order S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California’s transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill 97 (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the *State CEQA Guidelines* for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a “Sustainable Communities Strategy” (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Senate Bill 391 (SB 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 AB 32.

Executive Order B-16-12 (March 2012): This EO orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

Executive Order B-30-15 (April 2015): This EO establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all State agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMT CO₂e). Finally, it requires the Natural Resources Agency to update the State's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

Senate Bill 32, (SB 32) Chapter 249, 2016: This bill codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

3.2.2 Environmental Setting

In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every 5 years. ARB approved the *First Update to the Climate Change Scoping Plan* on May 22, 2014. ARB approved the *Final 2017 Scoping Plan Update* on December 14, 2017 that reflects the 2030 target established in EO B-30-15 and SB 32.

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, ARB released the GHG inventory for California.¹ ARB is responsible for maintaining and updating California's GHG Inventory per Health and Safety Code Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in Figure 3.2-1 represent a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists ARB in demonstrating progress toward meeting the 2020 goal of 431 MMT CO₂e.² The 2017 edition of the GHG emissions inventory (released in June 2017) found total California emissions of 440.4 MMT CO₂e, showing progress towards meeting the AB 32 goals.

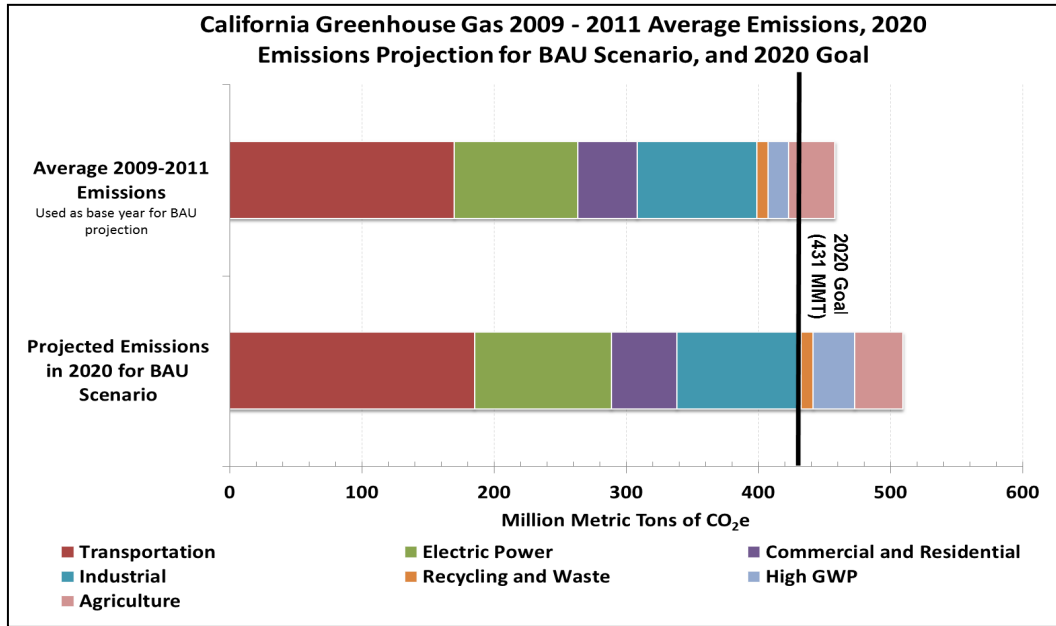
The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery.

The total emissions expected in the 2020 BAU scenario include reductions anticipated from Pavley I and the Renewable Electricity Standard (30 MMT CO₂e total). With these reductions in the Baseline condition, estimated 2020 statewide BAU emissions are 509 MMT CO₂e.

¹ ARB. 2017. California Greenhouse Gas Emission Inventory (Released June 2017). Website: <https://www.arb.ca.gov/cc/inventory/data/data.htm>

² The revised target using Global Warming Potentials (GWP) from the IPCC Fourth Assessment Report (AR4).

Figure 3.2-1: 2020 Business as Usual (BAU) Emissions Projection 2014 Edition



Source: ARB. Greenhouse Gas Inventory. Website: <https://www.arb.ca.gov/cc/inventory/data/bau.htm>.

3.2.3 Project Analysis

An individual project does not generate enough GHG 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 GHG.¹ In assessing cumulative impacts, it must be determined if a project’s incremental effect is “cumulatively considerable” (*State CEQA 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.

¹ 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 SCAQMD (Chapter 6: The CEQA Guide, April 2011), and the United States Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

GHG emissions for transportation projects can be divided into those produced during operations and those produced during construction. The following represents a best-faith effort to describe the potential GHG emissions related to the proposed project.

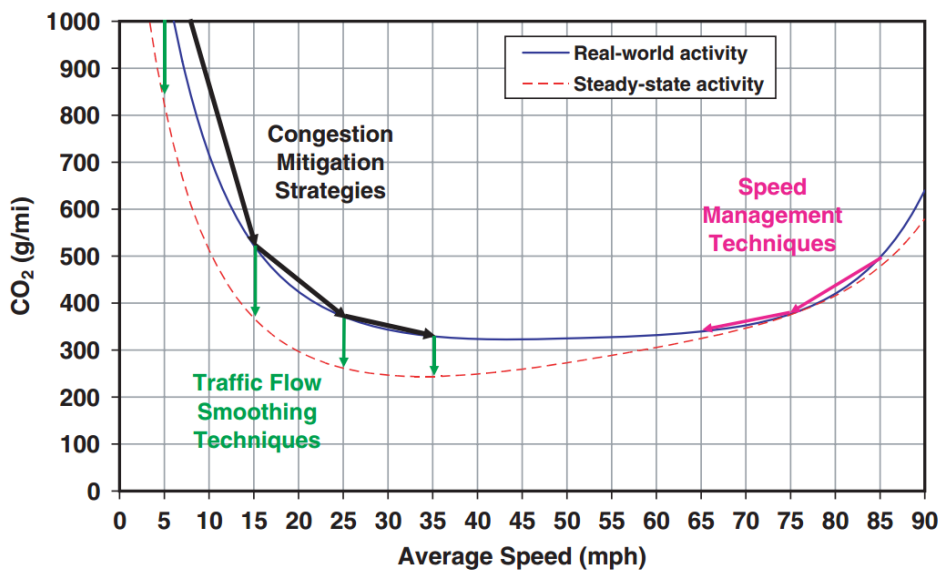
Operational Emissions

Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued concurrently.

FHWA supports these strategies to lessen climate change impacts, which correlate with efforts that the State of California is undertaking to reduce GHG emissions from the transportation sector.

The highest levels of CO₂ from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour [mph]) and speeds over 55 mph; the most severe emissions occur from 0–25 mph (see Figure 3.2-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO₂, may be reduced.

Figure 3.2-2: Possible Use of Traffic Operation Strategies in Reducing On-Road CO₂ Emissions



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside (May 2010). Website: <http://uctc.berkeley.edu/research/papers/846.pdf>.

SCAG's 2016 RTP/SCS complies with the emission reduction targets established by the California Air Resources Board (ARB) and meets the requirements of SB 375 as codified in Government Code §65080(b) et seq. by achieving per capita GHG emission reductions relative to 2005 of 8 percent by 2020 and 18 percent by 2035, which meets or exceeds targets set by ARB. As required by SB 375, this SCS outlines growth strategies that better integrate land use and transportation planning and help reduce the State's GHG emissions from cars and light trucks. The proposed project is listed in the 2016 RTP/SCS (project ID: ORA130302) as well as the 2017 FTIP, and those project listings can be found in Appendix E. The purpose of the proposed project is to address existing and future traffic demand on I-5 from I-405 to SR-55.

The goal of the proposed project is to also minimize environmental impacts as well as right-of-way acquisitions within the project limits. The project would address congestion and enhance freeway operations as follows:

- Increase the mainline capacity within the project limits along the I-5 corridor;
- Improve the capacity of the ramps within the project limits along the I-5 corridor;
- Improve the existing auxiliary lanes operations; and
- Optimize the access of the existing HOV lane.

The project would be consistent with the following goals listed in the 2016 RTP/SCS:

- Maximize mobility and accessibility for all people and goods in the region;
- Preserve and ensure a sustainable regional transportation system; and
- Maximize the productivity of the region's transportation system.

The project will assist the region with its overall goals to reduce vehicle-related GHGs by relieving congestion and improving traffic flow, thereby reducing emissions. This is consistent with the RTP/SCS's identified strategies to manage congestion by maximizing the current system and ensuring it operates with maximum efficiency and effectiveness.

The 2016 RTP/SCS commits \$6.9 billion toward transportation demand management (TDM) strategies and \$9.2 billion for transportation systems management (TSM) improvements in the region. Both TSM and TDM elements are included in the proposed project and already utilized in the project corridor, including ramp metering and high-occupancy vehicle (HOV) lanes. Together, congestion management, TDM, and TSM strategies will all help the region achieve its goals of VMT and VHT reduction.

Alternative travel modes were considered in the *Final Value Analysis Study Report* (January 2017). Design Suggestion MT-1, a subway/light rail option intended to reduce vehicles on the roadway, was put forth but not carried forward into the environmental document because the options do not meet the project's purpose and need of increasing capacity on the mainline and ramps of the project limits, optimizing access between the mainline and existing HOV lane, and improving operational deficiencies of merge, diverge, and weave areas.

OCTA Bus Routes 83, 206, and 212 operate partially on I-5 within the project limits. There are no known plans at this time to add or modify transit facilities within the project limits, and the current Project Description does not include modification of transit facilities or operations on I-5. However, improvements to mainline capacity would provide transit benefits by reducing travel time and increasing trip reliability that currently operates on the project segment of I-5, or would in the future.

OCTA completed a Major Investment Study (MIS) for south Orange County in 2008. The MIS developed an integrated, multimodal transportation plan that addresses mobility needs of motorists, pedestrians, and transit users. The OCTA Board adopted a resolution supporting the Locally Preferred Strategy (LPS) identified in the MIS, which included the addition of general-purpose lanes and interchange improvements within the project limits of I-5. Additionally, AB 2542 requires any State or local automobile capacity-increasing project or highway realignment project approved by the California Transportation Commission to have considered reversible lanes; however, AB 2542 does not apply to this project.

Quantitative Analysis

Table 3.2.1 depicts the annual CO₂e emissions and VMT on the I-5 project corridor, which includes the I-5 mainline, HOV, and ramps within the project limits. As shown, the existing VMT in the project corridor generates 491,331 metric tons of CO₂e (MT CO₂e) per year. Under the 2030 No Build scenario, emissions would decrease to 325,063 MT CO₂e. The Build Alternative would generate 363,790 MT CO₂e per year in 2030, a substantial decrease (approximately 26 percent) when compared to existing conditions, but a slight increase (approximately 3 percent) when compared to the 2030 No Build Scenario, due to the increase in VMT seen under the Build Alternative compared to the No Build Alternative.

Table 3.2.1: Project Corridor Modeled Annual CO₂e Emissions and Vehicle Miles Traveled (by Alternative)

Alternative	CO ₂ e Emissions (MT/yr)	Annual Vehicle Miles Traveled ¹
Existing/Baseline 2014	491,331	3,475,094
Open to Traffic 2030		
No Build	352,063	3,871,635
Alternative 2A and Alternative 2B (Preferred Alternative)	363,790	3,997,887
Horizon Year 2050		
No Build	337,540	4,115,471
Alternative 2A and Alternative 2B (Preferred Alternative)	351,100	4,279,133

Source: EMFAC (2014).

¹ Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per ARB methodology (ARB 2008).

ARB = California Air Resources Board

CH₄ = methane

CO₂e = carbon dioxide equivalent: a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential. For this analysis, global warming potential was applied to CH₄ emissions (which are nominal from vehicle emissions) and combined with CO₂ to reach the total CO₂e emissions.

MT/yr = metric tons per year

In 2050, 337,540 MT CO₂e would be emitted under the No Build condition. This represents a further decrease when compared to existing Baseline conditions. The Build Alternative is projected to emit 351,100 MT CO₂e, an increase of approximately four percent over the 2050 No Build condition due to increased VMT, but a decrease of approximately 29 percent when compared to existing Baseline conditions. The VMT increase along the I-5 corridor conservatively assumes that the additional general purpose lanes proposed by the Build Alternative would attract traffic from the surrounding area. Therefore, the VMT increases in the project corridor yet decreases in the surrounding areas and region. As compared to the Build Alternative, there is only a nominal difference in CO₂e as a result of Design Option 3 in both 2030 and 2050.

In the Opening and Horizon Years, regional GHG emissions would be less than existing conditions under all alternatives because EMFAC accounts for emissions benefits of rulemakings, including on-road diesel fleet rules, Advanced Clean Car Standards, and the Smartway/Phase I Heavy Duty Vehicle Greenhouse Gas Regulation. The California vehicle fleet is also assumed to become less polluting over time as older engines are phased out and replaced by newer, less polluting engines. The improvement in emission rates offsets the VMT increase.

While EMFAC has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its emission rates are based on tailpipe emission test data. The numbers are estimates of CO₂e emissions and not necessarily the actual CO₂e emissions. The model does not account for factors such as the rates of acceleration and vehicles' aerodynamics, which would influence CO₂e emissions. To account for CO₂ emissions, ARB's GHG Inventory follows the IPCC guideline by assuming complete fuel combustion, while still using EMFAC data to calculate CH₄ and N₂O emissions. Though EMFAC is currently the best available tool for use in calculating GHG emissions, it is important to note that the CO₂e numbers provided are only useful for a comparison of alternatives.

Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO₂ emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO₂ emissions due to impacts on traffic. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008) and a 2009 University of California study,¹ brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO₂ emissions during a typical urban trip. Current emission-factor models do not distinguish the emission of such modal events (i.e., acceleration, deceleration) in the operation of a vehicle and instead estimate emissions by average trip speed. It is difficult to model this because the frequency and rate of acceleration or deceleration that drivers choose to operate their vehicles depend on each individual's human behavior, their reaction to other vehicles' movements around them, and their acceptable safety margins. Currently, the EPA and the ARB have not approved a modal emissions model that is capable of conducting such detailed modeling. This limitation is a factor to consider when comparing the model's estimated emissions for various project alternatives against a baseline value to determine impacts.

Other Variables

With the current understanding, project-level analysis of greenhouse gas emissions has limitations. Although a GHG analysis is included for this project, there are

¹ Matthew Barth, Kanok Boriboonsomsin. 2009. *Energy and Emissions Impacts of a Freeway-Based Dynamic Eco-Driving System*. Transportation Research Part D: Transport and Environment Volume 14, Issue 6, August 2009, Pages 400–410.

numerous external variables that could change during the design life of the proposed project and would thus change the projected CO₂ emissions.

First, vehicle fuel economy is increasing. The EPA’s annual report, *Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2016*,¹ which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy improves each year with a noticeable rate of change beginning in 2005. Corporate Average Fuel Economy (CAFE) standards remained the same between model years 1995 and 2003, subsequently increasing to higher fuel economy standards for future vehicle model years. The EPA estimates that light duty fuel economy rose by 29 percent from model year 2004 to 2015, attributed to new technology that improved fuel economy while keeping vehicle weight relatively constant. Table 3.2.2 shows the increases in required fuel economy standards for cars and trucks between model years 2012 and 2025, from the National Highway Traffic Safety Administration for the 2012–2016 and 2017–2025 CAFE Standards.

Table 3.2.2: Average Required Fuel Economy (mpg)

	2012	2013	2014	2015	2016	2017	2018	2020	2025
Passenger Cars	33.3	34.2	34.9	36.2	37.8	39.6–40.1	41.1–41.6	44.2–44.8	55.3–56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.1–29.4	29.6–30.0	30.6–31.2	39.3–40.3
Combined	29.7	30.5	31.3	32.6	34.1	35.1–35.4	36.1–36.5	38.3–38.9	48.7–49.7

Sources: EPA 2013. Website: <http://www.epa.gov/fueleconomy/fetrends/1975-2012/420r13001.pdf>; EPA 2012, Website: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2017-and-later-light-duty-vehicle#rule-summary>.

EPA = United States Environmental Protection Agency
mpg = miles per gallon

Second, new lower-emission and zero-emission vehicles will come into the market within the expected design life of this project. According to the 2013 Annual Energy Outlook (AEO 2013):

LDVs that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG

¹ United States Environmental Protection Agency. Website: <https://www.epa.gov/fuel-economy/light-duty-automotive-technology-carbon-dioxide-emissions-and-fuel-economy-trends-1975-1>.

emissions and CAFE standards over the projection period. Sales of such vehicles increase from 20 percent of all new LDV sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case.¹

The greater percentage of lower-emissions and zero-emissions vehicles on the road in the future will reduce overall GHG emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

Third, California adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in Title 17, California Code of Regulations, Sections 95480–95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and 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 GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

The Build Alternative would comply with any federal, State, and/or local rules and regulations developed as a result of implementing control and mitigation measures proposed as part of their respective State Implementation Plans. Based on the Roadway Construction Emissions Model (RCEM, Version 8.1.0) developed by the Sacramento Metropolitan Air Quality Management District, GHG emissions associated with construction of the proposed project would be 759 tons (689 metric tons) of CO₂e (CO₂ and CH₄ emissions). With an expected construction duration of approximately two years, annual emissions during construction would be 345 metric tons per year.

¹ U.S. Energy Information Administration. Annual Energy Outlook 2013 with Projections to 2040. Website: [http://www.eia.gov/forecasts/aeo/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf).

Measures and project features to reduce construction GHG emissions are included as part of the Build Alternative and can be found in Section 2.13, Air Quality. These measures include maintaining construction equipment vehicles to reduce and control ozone precursors (Project Feature AQ-2) and equipping construction vehicles and equipment with State-mandated emission control devices pursuant to State emission regulations and standard construction practices (Measure PF-AQ-3). Project Feature PF-T-1 (see Section 2.5.3) specifies that a final TMP will be prepared prior to construction that identifies methods to address construction-related traffic and circulation effects.

3.2.4 CEQA Conclusion

As discussed above, all alternatives show a reduction in GHGs in 2030 and 2050 compared to existing conditions, due to improvements in fuel efficiency and engine technologies. However, the Build Alternative shows an increase in GHG emissions in 2030 and 2050 compared to Alternative 1, the No Build Alternative. Nonetheless, there are also limitations with EMFAC and with assessing what a given CO₂ emissions increase resulting from an individual project means for global climate change. Therefore, it is Caltrans' determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

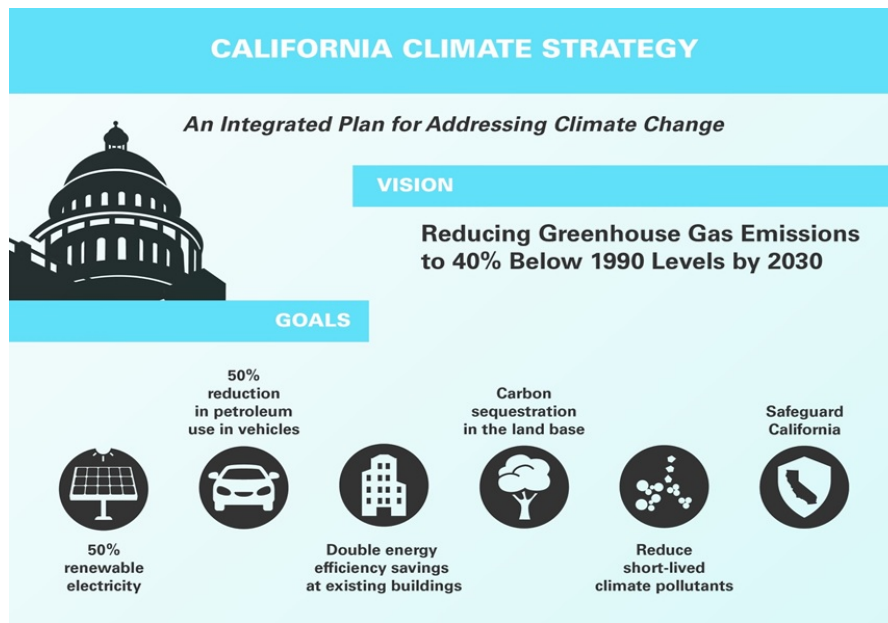
Statewide Efforts

In an effort to further the vision of California's GHG reduction targets outlined in AB 32 and SB 32, Governor Brown identified key climate change strategy pillars (concepts). These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 GHG emissions target.

These pillars include: (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent of the State's electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the State's climate adaptation strategy, *Safeguarding California*.

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction in VMT. One of Governor Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030. See Figure 3.2-3.

Figure 3.2-3: The Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals



Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all of the other statewide transportation planning documents.

SB 391(Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several funding and technical assistance programs that have GHG reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in Caltrans *Activities to Address Climate Change* (2013).

Caltrans Director's Policy 30 (DP-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) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies

The following project features and measures will also be implemented in the Build Alternative to address GHG emissions and potential climate change impacts from the project.

Measure AQ-4 will control ozone precursor emissions from construction equipment vehicles by maintaining equipment engines in good condition and in proper tune per manufacturer specifications and to the satisfaction of the Resident Engineer, which may include periodic inspections of construction equipment.

Project Feature PF-AQ-1 states that the contractor shall adhere to Caltrans' Standard Specifications for Construction (2015) Section 14.

Project Feature PF-AQ-3 mandates that construction vehicles and equipment would be required to be equipped with the State-mandated emission control devices pursuant to State emission regulations and standard construction practices, in order to further minimize construction-related emissions.

Landscaping reduces surface warming, and through photosynthesis, decreases CO₂. The project would include planting in the intersection slopes, drainage channels, and seeding in areas next to frontage roads, as well as planting a variety of different-sized plant material and scattered skyline trees where appropriate. These trees will help offset any potential CO₂ emissions increases.

The construction contractor must comply with SCAQMD rules, ordinances, and regulations in regards to air quality restrictions.

A final TMP will be prepared prior to construction that identifies methods to avoid and minimize construction-related traffic and circulation effects and minimize impacts to pedestrian and bicycle access during project construction.

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—or, put another way, planning and design for resilience. Climate change is expected to produce increased variability in precipitation, rising

temperatures, rising sea levels, variability in storm surges and their intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from 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. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

Federal Efforts

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the CEQ, the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011,¹ 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 provided an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

The United States Department of Transportation issued USDOT Policy Statement on Climate Adaptation in June 2011, committing to “integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions.”²

To further the USDOT Policy Statement, in December 15, 2014, FHWA issued order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events).³ This directive established FHWA policy to strive to

¹ Obama White House. 2017. Council on Environmental Quality Climate Change Resilience. Website: <https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/resilience>.

² FHWA. Sustainability (Guidance withdrawn on May 19, 2017). Website: https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm.

³ FHWA. 2014. FHWA Order 5520. Website: <https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm>.

identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.

FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, State, and local levels.¹

State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of State agencies to address California's vulnerability to sea-level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea-level rise and directed all State agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, 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, and storm surge and storm wave data.

Governor Schwarzenegger also requested the National Academy of Sciences, Engineering, and Medicine to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington* (Sea-Level Rise Assessment Report)² was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; and the range of uncertainty in selected sea-level rise projections. It provided 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; and a discussion of future research needs regarding sea-level rise.

¹ FHWA. 2017. Sustainability Resilience (updated October 19, 2017). Website: <https://www.fhwa.dot.gov/environment/sustainability/resilience/>.

² National Academy of Sciences, Engineering, and Medicine. 2012. *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. Website: http://www.nap.edu/catalog.php?Record_id=13389.

In response to EO S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, State, federal, and public and private entities, developed *The California Climate Adaptation Strategy* (December 2009),¹ which summarized the best available science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across State agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan).

Governor Jerry Brown enhanced the overall adaptation planning effort by signing EO B-30-15 in April 2015, requiring State agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how State agencies are implementing EO B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

EO S-13-08 also gave rise to the *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), of which Caltrans is a member. First published in 2010, the document provided “guidance for incorporating sea-level rise (SLR) projections into planning and decision making for projects in California,” specifically, “information and recommendations to enhance consistency across agencies in their development of approaches to SLR.” The March 2013 update² finalizes the SLR Guidance by incorporating findings of the National Academy’s 2012 final Sea-Level Rise Assessment Report; the policy recommendations remain the same as those in the 2010 interim SLR Guidance. The guidance will be updated as necessary in the future to reflect the latest scientific understanding of how the climate is changing and how this change may affect the rates of SLR.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system

¹ State of California. Climate Change – California Climate Adaptation Strategy. 2011–2017. Website: <http://www.climatechange.ca.gov/adaptation/strategy/index.html>.

² State of California. 2017. Ocean Protection Council. *Sea-Level Rise Guidance Document*. Website: <http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/>.

from increased precipitation, and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is actively engaged in working towards identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in EO B-30-15.

The proposed project is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

SCAG RTP/SCS GHG Project-Level GHG Reduction Strategies

1. Measures that consider incorporation of Best Available Control Technology (BACT) during design, construction, and operation of projects to minimize GHG emissions, include, but are not limited to, the following:
 - Use energy and fuel-efficient vehicles and equipment. Project proponents are encouraged to meet and exceed all EPA/NHTSA/ARB standards relating to fuel efficiency and emission reductions
 - Use alternative (non-petroleum based) fuels
 - Deployment of zero- and/or near zero emission technologies as defined by ARB
 - Use lighting systems that are energy efficient, such as Light Emitting Diode (LED) technology;
 - Use the minimum feasible amount of GHG-emitting construction materials;
 - Use cement blended with the maximum feasible amount of fly ash or other materials that reduce GHG emissions from cement production;
 - Incorporate design measures to reduce GHG emissions from solid waste management through encouraging solid waste reduction, recycling, and reuse;
 - Incorporate passive solar and other design measures to reduce energy consumption and increase production and use of renewable energy;
 - Incorporate design measures like Water Sense fixtures and water capture to reduce water consumption;
 - Use lighter-colored pavement where feasible;
 - Recycle construction debris to the maximum extent feasible;
 - Protect and plant shade trees in or near construction projects where feasible; and
 - Solicit bids that include concepts listed above.

2. Minimize unnecessary vehicular and machinery activities.
3. Revegetate disturbed land.
4. Ensure that all construction equipment is properly tuned and maintained.
5. Minimize idling time to five minutes—saving fuel and reducing emissions.
6. Project sponsors should ensure to the extent possible that construction activities utilize grid-based electricity and/or on-site renewable electricity generation rather than diesel and/or gasoline-powered generators.
7. Develop a traffic plan to minimize traffic flow interference from construction activities.
8. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites.
9. As appropriate, require that portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, obtain ARB Portable Equipment Registration with the State or a local district permit. Arrange appropriate consultations with ARB or the District to determine registration and permitting requirements prior to equipment operation at the site.
10. Diesel- or gasoline-powered equipment shall be replaced by the lowest emitting feasible for each piece of equipment from among these options: electric equipment whenever feasible, gasoline-powered equipment if electric infeasible.
11. On-site electricity shall be used in all construction areas that are demonstrated to be served by electricity.
12. Convert part of the construction truck fleet to natural gas.
13. Include “clean construction equipment fleet,” defined as a fleet mix cleaner than the State average, in all construction contracts.
14. Fuel all off-road and portable diesel-powered equipment with ARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road).
15. Use electric fleet or alternative fueled vehicles where feasible including methanol, propane, and compressed natural gas.
16. Use diesel construction equipment meeting ARB’s Tier 4 certified engines or cleaner off-road heavy-duty diesel engines and comply with State off-road regulations.

17. Use on-road, heavy-duty trucks that meet ARB's 2007 or cleaner certification standard for on-road diesel engines, and comply with the State on-road regulations.
18. Use idle reduction technology, defined as a device that is installed on the vehicle that automatically reduces main engine idling and/or is designed to provide services, e.g., heat, air conditioning, and/or electricity to the vehicle or equipment that would otherwise require the operation of the main drive engine while the vehicle or equipment is temporarily parked or is stationary.
19. Minimize idling time either by shutting off equipment when not in use or limit idling time to three minutes. Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the three-minute idling limit. The construction contractor shall maintain a written idling policy and distribute it to all employees and subcontractors. The on-site construction manager shall enforce this limit.
20. The engine size of construction equipment shall be the minimum practical size.
21. Signs shall be posted in designated queuing areas and job sites to remind drivers and operators of the idling limit.
22. Construction worker trips shall be minimized by providing options for carpooling and by providing for lunch on site.
23. Use new or rebuilt equipment.
24. Maintain all construction equipment in proper working order, according to manufacturers' specifications. The equipment must be checked by a National Institute for Automotive Service Excellence (ASE) certified mechanic and determined to be running in proper condition before it is operated.
25. Coordinate controlled intersections so that traffic passes more efficiently through congested areas. Where traffic signals or streetlights are installed, require the use of LED technology or similar technology.
26. Determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of this project and other nearby projects that could be simultaneously under construction. Develop a construction management plan that includes the following items and requirements, if determined feasible and applicable by the Lead Agency:

- A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes.
- Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur.
- Location of construction staging areas for materials, equipment, and vehicles at an approved location.
- A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem. The Lead Agency shall be informed who the manager is prior to the issuance of the first permit.
- Provision for accommodation of pedestrian flow.
- As necessary, provision for parking management and spaces for all construction workers to ensure that construction workers do not park in on-street spaces.
- Any damage to the street caused by heavy equipment, or as a result of this construction, shall be repaired, at the project sponsor's expense, within one week of the occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair shall occur prior to issuance of a final inspection of the building permit. All damage that is a threat to public health or safety shall be repaired immediately. The street shall be restored to its condition prior to the new construction as established by the Lead Agency (or other appropriate government agency) and/or photo documentation, at the sponsor's expense, before the issuance of a Certificate of Occupancy.