

Chapter 3 California Environmental Quality Act Evaluation

The proposed project is a joint project by the California Department of Transportation (Department, Caltrans) and the FHWA and is subject to State and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the CEQA and the 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 USC Section 327 and the NEPA Assignment MOU dated December 23, 2016, and executed by FHWA and Caltrans. The Department 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 the Department 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 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 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 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 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; Chapters 1 and 2 contain 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 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) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<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 type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Aesthetics

Determination is based on Section 2.6, Visual/Aesthetics, of this IS/EA and the Visual Impact Assessment completed for the project (October 2018).

a) *No Impact*

The proposed project would not have a substantial adverse impact on a scenic vista because the project area does not include any scenic vistas.

b) *No Impact*

SR 55 is not a designated scenic highway. The nearest Scenic Highway is the portion of SR 91 extending for 4 miles east from the SR 55/SR 91 interchange.

c) *Less Than Significant Impact*

The proposed Build Alternative would result in compatible visual characteristics to the existing project corridor. The proposed elements are continuous of the existing infrastructure and do not encroach or obstruct any existing views or elements. The visual quality and character will be harmonious and consistent with the existing visual quality. The project would not change existing land use patterns along SR 55 because SR 55 is an existing transportation facility in a highly developed area.

d) No Impact

The proposed project would not include new lighting elements in an area in which there is currently no lighting.

3.1.2 Agriculture and Forest Resources

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 Department 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 ARB.

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

Determinations made based on available information from the California Department of Conservation (2018b) for Farmlands and the project location for forest resources.

a) No Impact

The California Department of Conservation has mapped the project area as Urban and Built up (California Department of Conservation 2018b).

b) No Impact

No parcels under a Williamson Act contract are within the project limits.

c, d) No Impact

No forest or timberlands are within the project limits.

e) No Impact

No other changes are anticipated to farmland or forest land.

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) 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"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) 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

Determinations are based on Section 2.13, Air Quality, of this IS/EA and the Air Quality Technical Study for the project (November 2018, updated 2019).

a) No Impact

The project is listed in the 2016–2040 financially constrained RTP/SCS, which was found by the SCAG to conform on April 7, 2016; and FHWA and FTA made a regional conformity determination finding on June 2, 2016. The project is also included in SCAG financially constrained 2019 FTIP, page 2 of the Orange County Project Listing for State Highways. The 2019 FTIP (SCAG 2018) was determined to conform by FHWA and the FTA on December 17, 2018. The design concept and scope of the project is consistent with the project description in the 2016–2040 RTP/SCS, 2019 FTIP, and the “open to traffic assumptions of the SCAG regional emissions analysis. There is no potential for a significant impact.

b) *Less Than Significant Impact*

California is divided geographically into 15 air basins for the purpose of managing the air resources of the State at a regional level. Each air basin generally has similar meteorological and geographic conditions throughout. Each local district is responsible for preparing the portion of the State Implementation Plan (SIP) applicable within its boundaries.

The South Coast Air Basin (Basin) is the appropriate study area for evaluation of cumulative impacts for air quality. The Basin is currently designated as in nonattainment of the federal and State ambient air quality standards for ozone (O₃), respirable particulate matter less than 10 microns in diameter (PM₁₀), and fine particulate matter less than 2.5 microns in diameter (PM_{2.5}). Therefore, an ongoing cumulative impact is associated with these air pollutants. The potential for the project to contribute to a permanent cumulative impact is assessed through consistency with air quality plans.

Per CEQA Guidelines Section 15130 (d), where a project is included in an approved regional plan (among other land use plans) that adequately addresses the effected resource area, no additional analysis is required. Because the project is listed in the region's currently conforming the 2016-2040 RTP/SCS, associated project emissions would not be cumulatively considerable.

c) *Less Than Significant Impact*

In complying with U.S. EPA Transportation Conformity requirements, the project underwent Interagency Consultation to determine the likelihood for pollutant hot-spots and localized exposure. As discussed in Sections 2.13.1.1 and 4.2.5, Interagency Consultation participants concurred on May 22, 2018, that the project is not a POAQC for particulate matter. Participants in making the determination included U.S. EPA, FHWA, FTA, Caltrans, California ARB, and SCAQMD. The air quality analysis for the project also demonstrates that the project would not result in a localized CO hot-spot.

Also, as presented in Section 2.13, a detailed mobile source air toxics analysis was completed for the project. The latest version of CT-EMFAC was used to estimate daily emissions of benzene, 1,3-butadiene, formaldehyde, acrolein, naphthalene, diesel particulate matter, and Polycyclic Organic Matter. Emissions of all MSAT compounds under the Build Alternative would be less than the Existing/Baseline Condition in 2035 and 2055. Impacts would be less than significant.

d) *Less Than Significant Impact*

Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site. Such odors would be quickly dispersed below detectable thresholds as distance from the site increases. Construction emissions would be temporary and limited to the immediate area surrounding the construction site and would not have a significant effect on sensitive receptors. Caltrans standard specifications require documentation of odors and corrective actions taken. Regarding operational activities, the project would not generate a substantial source of odors. The land uses and industrial operations commonly associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills,

dairies, and fiberglass molding. It is not anticipated that odors generated by vehicles would be perceptible beyond the Caltrans right-of-way. Impacts would be less than significant.

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 Wildlife, U.S. Fish and Wildlife Service, or NOAA Fisheries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 Wildlife or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on state or federally protected wetlands (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

Determinations are based on Section 2.15, Natural Communities; 2.16, Wetlands and Other Waters; 2.17, Plant Species; 2.18, Animal Species; 2.19, Threatened and Endangered Species; 2.20, Invasive Species; and the NES (mi) for the project (January 2019).

a) *Less Than Significant with Mitigation Incorporated*

Potential foraging and tree-roosting habitat for bats is scattered throughout the proposed project area, primarily in the form of non-native trees (such as eucalyptus and palm trees) and insects associated with patches of ornamental vegetation and concrete-lined drainages. Santiago Creek provides the only native, although substantially degraded, riparian vegetation. Construction of the proposed project would result in removal of vegetation. If bats are located in the vegetation, removal could result in construction-related mortality and would be considered a significant impact.

Potential day and night roosting habitat was also identified within the biological survey area (BSA). Potential day roosts within the BSA for SR 55 are limited to two bridges (Santiago Creek and the abandoned railroad overhead) and one culvert (Highland Drainage Channel). Potential night roosting sites may occur at four additional sites (Lincoln Avenue undercrossing, Taft Avenue undercrossing, Chapman Avenue undercrossing, and westbound SR 22 separation). Currently, no construction activities are anticipated near Taft Avenue or Chapman Avenue undercrossings. A new Lincoln Avenue southbound off-ramp structure would be constructed adjacent to the Lincoln Avenue undercrossing. An additional northbound and southbound general purpose lane would be constructed in the vicinity of the westbound SR 22 separation. Construction to or near culverts and bridges could result in significant impacts to bats.

Additionally, the project is not scheduled to go to construction until 2032. The existing condition could change substantially between approval of this IS/EA and start of construction that would result in impacts to bats that could be significant.

The following Mitigation Measure is proposed:

BIO-1 BATS Complete preconstruction bat habitat assessment will be conducted to reevaluate the protection status for bat species potentially within the project area. Preconstruction habitat assessment will include the following:

A bat roost habitat reassessment and acoustic and emergence bat surveys should be completed throughout the Study Area within one year ahead of project implementation.

At project structures that may provide night roost habitat (Lincoln Avenue undercrossing, Taft Avenue undercrossing, Chapman Avenue undercrossing, and westbound SR 22 separation), determine which species may be present and their approximate number through acoustic monitoring and exit counts.

Verify if maternity colonies are present.

Ascertain which species are using project structures for night roosting.

Determine if special conservation measures may apply based on current regulatory practices, including exclusion measures, if necessary.

Implementation of BIO-1 would mitigate potential significant impacts to bats to less than significant.

b) No Impact

No habitats or natural communities of special concern would be directly or indirectly impacted by the proposed project.

c) *Less Than Significant Impact*

Six jurisdictional features would be temporarily impacted by the proposed Build Alternative. These features are all concrete-lined and would be relocated, realigned, or boxed. These drainages would continue to convey existing flows and would not result in any permanent impacts to waters of the United States or waters of the State.

d) *Less than Significant Impact*

The opportunity for wildlife movement within the proposed project area is minimal. Santiago Creek may provide for wildlife movement of common animal species associated with the proposed project area such as coyotes, raccoons, ground squirrels, and other small mammals. The nearest project improvements to Santiago Creek are approximately 1.0 mile south near the eastbound SR 22 to northbound SR 55 connector and approximately 3.0 miles north at the Katella Avenue/SR 55 southbound on-ramp. The project would have no impact on wildlife access to or within Santiago Creek

The proposed project provides little to no suitable habitat for nesting and foraging migratory birds. However, bird species adapted to freeway noise could nest within or adjacent to the proposed project impact area. Temporary impacts to these bird species may include increased noise, dust, lighting from construction activities, and clearing and grubbing to accommodate project features. The project would incorporate BIO-2 to ensure protection of migratory bird species.

e) *No Impact*

No local policies or ordinances protecting biological resources are relevant to the BSA. Therefore, the Build Alternative would not conflict with local policies or ordinances protecting biological resources.

f) *Less than Significant Impact*

OCTA Measure M Transportation Investment Plan (M2) NCCP/HCP are applicable to the proposed project. The OCTA Measure M2 NCCP/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) 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

Determinations are based on Section 2.7, Cultural Resources, and the HPSR for the project (March 2019) and Section 2.11 Paleontology and the PIR/PER for the project (October 2018). In accordance with PRC section 21080.3.1 and AB 52, Caltrans initiated early consultation with California Native American tribes in March 2018. Refer to Chapter 4 of this IS/EA for detailed information pertaining to California Native American Tribe consultation.

a) *Less than Significant Impact*

Three properties were determined historical resources for the purposes of CEQA [resources in this category would include the CRHR listed or eligible resources (per State Historical Resources Commission determination), resources identified as significant in surveys that meet State Office of Historic Preservation standards, resources that are designated landmarks under local ordinances, and resources that meet the CRHR criteria as outlined in PRC 5024.1.]:

Table 3.1-1: Eligible Historical Resources

Name	Address/Location	Community	OHP Status Code	Map Reference No.
750 West First Street	750 West First Street	Tustin	5S3	750 West First Street
14841 Yorba Street	14841 Yorba Street	Tustin	2S	14841 Yorba Street
Chamber House	14891 Yorba Street	Tustin	2S	14891 Yorba Street

These properties are located outside the direct APE. The proposed project would not result in any changes to the properties' setting or require easements or acquisition on or adjacent to these properties.

b) *Less Than Significant Impact*

The records search showed that the APE and a 1-mile radius around it has been extensively studied by 171 previous investigations, the results of these investigations show that only one previously documented resource is situated within the APE: a 1914 Craftsman Bungalow residence that is no longer extant. No archaeological resources were identified within the APE as a result of the records search or field survey. In the unlikely event that previously

unidentified cultural materials are unearthed during construction, Project Feature PF-CUL-1 requires if cultural materials are discovered during site preparation, grading, or excavation, the construction contractor will divert all earthmoving activity within and around the immediate discovery area until a qualified archaeologist can assess the nature and significance of the find. At that time, the Caltrans District 12 Environmental Branch Chief will be coordinated with to determine appropriate course of action.

c) *Less Than Significant Impact*

No human remains were identified within the APE as a result of the record and literature searches, field surveys, and consultation. The project will implement PF-CUL-2 related to inadvertent discovery during site preparation, grading, or excavation.

Project Feature PF-CUL-2 requires that all work in the immediate area be halted if human remains are discovered and the Coroner be notified. At that time, coordination with the Caltrans District 12 Environmental Branch Chief will occur to determine the appropriate course of action. Further laws and provisions are to be followed as appropriate.

3.1.6 Energy

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Energy

a) *Less Than Significant Impact*

Regarding short-term and temporary energy consumption, construction activities would primarily consume diesel and gasoline through operation of heavy-duty construction equipment, material deliveries, and debris hauling. Energy use associated with proposed project construction is estimated to result in the short-term consumption of 310,629 gallons from diesel-powered equipment and 37,432 gallons from gasoline-powered equipment. This represents a small demand on local and regional fuel supplies that would be easily accommodated, and this demand would cease once construction is complete. Moreover, construction-related energy consumption would be temporary, and no permanent new source of energy demand would result from project construction activities. While construction would result in a short-term increase in energy use, construction-related fuel use would have no noticeable effect on peak or baseline demands for energy; and construction design features would help conserve energy. For example, recycled materials will be used where feasible. Recycled products typically have lower manufacturing and transport energy costs since they do not utilize raw materials, which must be mined and transported to a processing facility.

Regarding long-term and permanent energy consumption, operational activities would primarily require energy for transportation fuel, electricity for lighting, and maintenance activities. The consumption of transportation fuel would be the dominant energy use. Implementation of the project would marginally decrease regional fuel consumption in 2035 and would increase regional mobile source fuel consumption by less than 1 percent in 2055. The project does not include new light fixtures or removal or replacement of existing fixtures. Accordingly, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources. The impact would be less than significant.

b) Less Than Significant Impact

The project would be consistent with regional and State energy conservation plans. Planning documents with relevant energy assessments include the 2016–2040 RTP/SCS published by SCAG and the 2018 IERP (CEC 2018). The 2016–2040 RTP/SCS includes a comprehensive assessment of regional energy consumption primarily focused on residential and commercial electricity, natural gas, and water use. The 2016–2040 RTP/SCS Draft EIR (SCAG 2015b) includes a brief analysis of transportation fuel consumption. SCAG concluded in the Draft EIR that the 2016-2040 RTP/SCS would have a less than significant impact on increasing petroleum and non-renewable fuel usage because fuel consumption is expected to result in a 26.7 percent net reduction in the SCAG region from the 9.3 billion gallons consumed in 2012 to the projected 6.8 billion gallons consumed in 2040. Transportation fuel use would be less in the project opening and design years than existing/baseline condition. Furthermore, transportation fuel use in 2035 would be less with the project than without the project. A slight increase would occur in 2055 due to increased VMT, although the additional transportation fuel use would represent less than 1 percent increase in fuel use from the No Build Alternative. The project would be consistent with the energy findings in the 2016-2040 RTP/SCS and would not interfere with implementation of the 2016-2040 RTP/SCS.

The 2018 IERP includes key goals to guide the State's energy policy, including reducing petroleum use in cars and trucks by up to 50 percent. The discussion related to this goal broadly focuses on increasing the number of zero- or near-zero emission vehicles operating on the roadway network. It is also noteworthy that improving driving conditions reduces petroleum use. The Traffic Operations Report concludes that AM and PM peak-period vehicle delays would decrease by 19 percent and 6 percent, respectively, in 2035. The AM and PM peak-period vehicle delays would decrease by 14 percent and 4 percent, respectively, in 2055. The congestion improvement would reduce vehicle idling and associated fuel consumption. This would be consistent with the goal of reducing petroleum use in cars and trucks by up to 50 percent, and the project would not interfere with implementation of the 2018 IERP. Accordingly, the proposed project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. The impact would be less than significant.

3.1.7 Geology and Soils

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving::	See below	See below	See below	See below
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"/>
f) 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"/>

CEQA Significance Determinations for Geology and Soils

Determinations are based on Section 2.10, Geology/Soils/Seismology/Topography, Revised District Preliminary Geotechnical Report (May 2018), Section 2.11 Paleontology and the PIR/PER for the project (October 2018).

a) i) No Impact

The project limits are not in an Alquist-Priolo Earthquake Fault Zone, and no known active or potentially active faults are mapped as crossing or in the immediate vicinity of SR 55. The improvements in the Build Alternative are not expected to be exposed to effects associated with fault displacement or ground rupture.

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 associated with the faults in Table 2.10-1. 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

As discussed in Section 2.10, the site is not located in an area susceptible to landslides and/or rock fall. Nonseismically induced earth movement is unlikely to occur in the Study Area. No impacts on the Build Alternative related to landslides are expected.

b) Less Than Significant Impact

As discussed in Section 2.10, Construction of the Build Alternative may temporarily disturb soil associated with site preparation, grading, and excavation within the freeway rights-of-way and within the TCEs. Disturbed soil areas result in increased potential for soil erosion during construction compared to existing conditions. 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 and impacting water quality. With implementation of Project Features PF-WQ-1 and PF-WQ-2, described in Section 2.9.3, and Project Feature PF-GEO-2, described in Section 2.10.3, soil erosion impacts would be less than significant.

c) Less Than Significant Impact

As, discussed in Section 2.10, shallow groundwater was not encountered in the as-built borings along the project alignment. Sandy layers encountered in the borings were generally medium dense to dense; based on the available information, liquefaction potential is not a design consideration for the project. However, seismically induced settlement within loose to moderately dense sandy soil could occur and is anticipated to be on the order of 1.0 inch. Potential for unstable soils would be evaluated in Project Feature PF-GEO-1. Impacts to the Build Alternative due to unstable soils would be less than significant.

d) Less than Significant Impact

As discussed in Section 2.10, Based on the as-built LOTB, the near-subsurface soils along the project alignment consist mainly of sand, silty sand, and sandy silt from Main Street to Fairhaven Avenue and at Katella Avenue. The near-subsurface soils at Lincoln Avenue consist mainly of silty clay and sand with silt and gravel. Potential for expansive soils would be evaluated in Project Feature PF-GEO-1. Impacts to the Build Alternative due to expansive soils would be less than significant.

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.

f) Less Than Significant with Mitigation Incorporated

No paleontological resources were observed or collected during the survey; however, sediments conducive to fossil preservation, including those of the Pliocene Fernando Formation, were observed. The fine-grained material characteristic of these sediments is favorable for harboring recognizable and intact scientifically significant vertebrate fossils. Excavations (including drilling) into areas containing native Miocene, Pliocene, and Pleistocene sediments may result in significant impacts to paleontological resources.

The following Mitigation Measures are proposed:

- PALEO-1** Prior to construction, or initiated at the 65 percent Plans, Specification and Estimate (PS&E) design phase per Caltrans process, a Paleontological Mitigation Plan (PMP) will be prepared. It should provide recommended monitoring areas based on proposed construction activities and locations in sensitive geologic formations, depth of excavation, and results of geotechnical studies completed in the Area of Project Disturbance (APD) and immediate vicinity; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; notification procedures in the event of a fossil discovery by a paleontological monitor or other project personnel; and a potential cost estimate for mitigation. A curation agreement with a qualified repository with a curator on staff and retrievable storage will be required if paleontological specimens requiring preservation are identified.
- PALEO-2** Construction monitoring should initially be implemented for excavations occurring in areas of sediments with paleontological high sensitivity, with the exception of pile-driving activities and drilling using an auger bit that is less than 3 feet in diameter. Excavations in areas of low sensitivity sediments should be periodically spot checked when impacted depths exceed 5 feet to check for the presence of underlying older, high sensitivity deposits unless the depth to underlying sensitive sediments can be determined more precisely during the geotechnical review conducted during preparation of the PMP. If it is determined that only Quaternary young alluvial fan deposits (low paleontological potential [Caltrans 2016a]), Quaternary young wash deposits (low paleontological potential [Caltrans 2016a]), Quaternary young landslide deposits (low paleontological potential [Caltrans 2016a]), or artificial fill (low paleontological potential [Caltrans 2016a]) is impacted, monitoring and spot checking should be reduced or halted at the direction of the Principal Paleontologist. Quaternary young alluvial fan, wash, and landslide sediments and artificial fill should not be monitored. However, any potential fossils in these sediments that are unearthed during construction should be evaluated by the Principal Paleontologist as described in the PMP.

With implementation of PALEO-1 and PALEO-2, the Build Alternative would not result in significant impacts to paleontological resources or unique geologic features.

3.1.8 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? b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	See table note	See table note	See table note	See table note

Note: 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..

a) and b)

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.

3.1.9 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"/>

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 type="checkbox"/>	<input checked="" 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) 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"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Hazards and Hazardous Materials

Determinations are based on Section 2.12, Hazardous Waste/Materials, and Initial Site Assessment for the project (September 2014, updated 2018).

a) *Less Than Significant Impact*

During construction, there is the potential to encounter hazardous materials in soils and existing road and structures materials, including ADL, LBP, and ACM. 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 would ensure proper handling of hazardous waste and materials, and 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.

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 a) above, routine hazardous materials 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 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 and would not result in a significant permanent impact related to transport or upset of hazardous waste and materials.

c) *Less Than Significant Impact*

The following schools are located within 0.5 mile of the alignment of the Build Alternative: Robert Heideman Elementary School at 15571 Williams Street, Tustin; Helen Estock Elementary School at 14741 North B Street, Tustin; La Veta Elementary School at 2800 East La Veta Avenue, Orange; Palmyra Elementary School at 1325 East Palmyra Avenue, Orange; Handy Elementary School at 860 North Handy Street, Orange; and Nohl Canyon Elementary School at 4100 Nohl Ranch Road; Anaheim. No schools are known to be planned within 0.5 mile of the alignment of the Build Alternative. As discussed in Responses a) and b) above, routine hazardous materials would be used, handled, stored, disposed of, and transported during construction of the Build Alternative in accordance with applicable local, State, and federal regulations and would result in less than significant impacts related to the emissions or handling of hazardous waste or materials near existing or proposed schools.

d) *No Impact*

No locations within the project footprint are located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

e) *No Impact*

The project footprint is not located within an airport land use plan.

f) *Less Than Significant Impact*

As discussed in Sections 2.4, Utilities and Emergency Services, and 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, construction activities expected to require temporary closures of the SR 55 mainline, interchange ramps, and local arterials include:

- Installation, moving, and removal of construction barriers (k-rails)
- Pavement restriping
- Falsework erection and removal
- Construction of retaining walls and tie-back walls
- Widening of undercrossing structures and foundations
- Installation and removal of overhead signs and loop detectors
- Placement of concrete pavement using rapid set concrete, such as at ramp termini
- Asphalt and concrete pavement construction and overlay operations
- Utility work
- Extension or modifications of drainage channels

Project Feature PF-UES-2 requires the contractor to coordinate all temporary mainline, ramp, and arterial roadway closures and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response

times, including the identification of alternative routes for emergency vehicles and routes across the construction areas that are developed in coordination with the affected agencies and corridor cities. Project impacts to emergency response or evaluation plans would be less than significant.

g) 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 campfires, cigarettes, sparks from automobiles, and other ignition sources, typical of areas designated as very high fire hazard zones by the California Department of Forestry and Fire Protection. The proposed project is an urban built-out area and is not within a location designated as a very high fire hazard severity zone in with in Orange County. The Build Alternative would not expose people or structures to a significant risk of loss, injury, or death associated with wildland fires.

3.1.10 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 or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<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 or through the addition of impervious surfaces, in a manner which would:	See below	See below	See below	See below
(i) result in substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(iii) 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; or	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Hydrology and Water Quality

Determinations are based on Section 2.8, Hydrology and Floodplains, and Section 2.9, Water Quality and Stormwater Runoff, as well as the Water Quality Technical Memo (November 2018), Location Hydraulic Study (April 2018), Flood Plain Summary Report, and the Storm Water Data Report (March 2019) for the project.

a) *No 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 DSA would be 15.65 acres. 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 would address the potential effects of soil erosion and pollutants of concern on receiving waters. The project construction would also be required to comply with the requirements of the applicable 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.

The Build Alternative would result in permanent increases in impervious surface area by 2.90 acres, compared to the existing freeway facility. An increase in impervious area would increase the volume and potentially pollutants in runoff during storm events to receiving waters. As shown in Project Features PF-WQ-1, PF-WQ-2, 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 SWMP and follow the procedures outlined in the *Storm Water Quality Handbooks, Project Planning and Design Guide for implementing Design Pollution Prevention and Treatment BMPs* (Caltrans 2017e). 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, permanent impacts to water quality would be less than significant.

b) *Less Than Significant Impact*

Dewatering may be required during construction of the Build Alternative. If construction site dewatering is required it shall comply with Order No. R8-2015-0004 (NPDES No. CAG998001) for general WDRs for discharges to surface waters that pose an insignificant (de minimus) threat to water quality within the Santa Ana Region. This order would be applicable to the project if it can be demonstrated that the groundwater being discharged to surface waters does not contain pollutants of concern. Therefore, no significant impacts to surface water during construction activities as a result of site dewatering, are anticipated.

c) (i), (ii) and (iii) *Less Than Significant Impact*

Under the Build Alternative, the project would include roadway and ramp widening, relocation of a Park and Ride lot, and construction of retaining walls. These project

improvements would impact six concrete-lined features that would be relocated, realigned, or boxed. These drainages would continue to convey existing flows and would not result in any substantial erosion. Erosion during project construction and operation would be addressed based on compliance with the applicable NPDES permit and Project Features PF-WQ-1 through PF-WQ-4.

The Build Alternative proposes to modify an existing transportation facility. The Build Alternative would not substantively increase the total impervious surface areas as noted above and would not increase peak storm flows to the extent they would necessitate additional capacity that would negatively impact downstream drainage facilities. Additionally, considering PF-WQ-1 and PF-WQ-2 would minimize incremental pollutant loading; and impacts would be less than significant.

According to FEMA FIRM Panel Number 06059C0162J (Orange County, CA, Last Revised: December 3, 2009), the project is located within a 100-year floodplain contained within a concrete channel (Zone AE, areas where base flood elevations are determined) associated with Santiago Creek where the Santiago Creek Bridge (Bridge No. 55-0033) crosses SR 55. In addition, the eastern side of the project area along the SR 55 between Santiago Creek and I-5 is designated as Zone X (areas of 0.2 percent annual chance flood; areas of 1.0 percent annual chance flood with average depths of less than 1.0 foot or with drainage areas less than 1.0 square mile; and areas protected by levees from 1.0 percent annual chance flood). 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. Therefore, the Build Alternative does not include drainage modifications that would result in substantial erosion, siltation, or flooding on or off the project site; and impacts are less than significant.

c) (iv) No Impact

The project construction and operation activities would not reduce or otherwise affect the flood storage capacity and would not modify flood flows. Furthermore, construction activities would be limited to the dry season. Construction activities under the Build Alternative would not result in temporary adverse impacts related to hydrology and floodplains. Existing drainage patterns will be maintained on the ramps and on the freeway. It is not expected that any major culvert and bridge widening improvements would be required for this project.

d) Less Than Significant Impact

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 addition, also refer to refer to a) and e), above. Impacts to water quality as a result of the Build Alternative would be less than significant. The Build Alternative does not propose placing any structures within a 100-year floodplain. As discussed in Section 2.10, risk associated with tsunamis, seiches, and mudflows are negligible.

e) No Impact

The Build Alternative would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

3.1.11 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) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Land Use and Planning

Determinations are based on Sections 2.1, Land Use, and 2.3, Community Impacts.

a) No Impact

The proposed improvements are located within the SR 55 corridor. Within the corridor, the cities of Tustin, Orange, and Anaheim are located on both the east and west sides of SR 55. East/west access is provided by 14 over/undercrossings. The project would be primarily constructed within the existing State right-of-way (see Section 2.3.2.3 for detailed discussion of TCEs) and would not remove any east/west access. The proposed Build Alternative has no potential to result in additional division of the cities compared to the existing condition.

b) No Impact

The project is listed in the 2016–2040 financially constrained RTP/SCS which was found by SCAG to conform on April 7, 2016; and FHWA and FTA made a regional conformity determination finding on June 2, 2016. The project is also included in SCAG financially constrained 2019 FTIP (SCAG 2018), page 2 of the Orange County Project Listing for State Highways. The SCAG 2019 FTIP was determined to conform by FHWA and FTA on December 17, 2018. The design concept and scope of the project is consistent with the project description in the 2016–2040 RTP/SCS, 2019 FTIP, and the “open to traffic assumptions of the SCAG 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 2.1-2. The Build Alternative would not change existing land use patterns along SR 55 because SR 55 is an existing transportation facility in a highly developed area, and the Build Alternative would not require any property acquisition or amendment to any General Plans and is consistent with local plans and policies.

3.1.12 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

a) and b) No Impact

The proposed project would be primarily constructed within the existing right-of-way for SR 55 (see Section 2.3.2.3 for detailed discussion of TCEs). No mineral resources or mineral resource recovery sites are known to be located within the State right-of-way between I-5 and SR 91.

3.1.13 Noise

Would the project result in:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project 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) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) 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"/>

CEQA Significance Determinations for Noise

Determinations are based on Sections 2.14, Noise, and the Noise Study Report (September 2018) prepared for the project.

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 dBA maximum instantaneous noise level (L_{max}) at a distance of 50 feet 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: Project Feature PF-N-1: Compliance with the Caltrans Standard Specifications, Section 14-8.02, “Noise Control” during construction.

The Build Alternative would not result in any substantial increases in permanent noise levels in the Study Area and would not result in significant permanent noise impacts. 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 and long-term noise impacts resulting from the proposed project are less than significant.

b) Less Than Significant Impact

The closest sensitive receptors are within 50 feet of project construction areas. Sensitive receptor locations may be subject to short-term noise higher than 86 dBA L_{max} that is generated by construction activities along the project alignment. Project Feature PF-N-1 requires compliance with Caltrans Standard Specifications Section 14-8.02 (2015) and would minimize construction noise impacts on sensitive land uses adjacent to the project site. Construction noise from the contractor’s operations between the hours of 9:00 p.m. and 6:00 a.m. shall not exceed 86 dBA L_{max} at a distance of 50 feet.

Compliance with local Noise Ordinances and the Caltrans Standard Specifications required in Project Feature PF-N-1 in Section 2.14 would also minimize vibration impacts. Therefore, groundborne vibration and noise impacts are considered less than significant.

c) No Impact

JWA is located approximately 4.2 miles southwest from the southern terminus of the project. The Build Alternative would not expose people using SR 55 or living or working in the areas surrounding SR 55 to aviation-related noise levels different than would occur under existing or No Build conditions. The Build Alternative would not result in aviation-related noise impacts.

3.1.14 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"/>

CEQA Significance Determinations for Population and Housing

Determinations are based on Section 2.2, Growth.

a) and b) No Impact

The Build Alternative would provide improvements to the existing SR 55 as discussed in Chapter 1. The proposed project would be constructed primarily within the existing State right-of-way (see Section 2.3.2.3 for detailed discussion of TCEs) and would not directly or indirectly induce substantial population growth or displace any housing or people.

3.1.15 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
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Public Services

a) Less than Significant Impact

As discussed in Sections 2.4 and 2.5, Construction activities expected to require temporary closures of the SR 55 mainline, interchange ramps, and local arterials include those that could impact response times:

- Installation, moving, and removal of construction barriers (k-rails)
- Pavement restriping
- Falsework erection and removal
- Construction of retaining walls and tie-back walls
- Widening of undercrossing structures and foundations
- Installation and removal of overhead signs and loop detectors
- Placement of concrete pavement using rapid set concrete, such as at ramp termini
- Asphalt and concrete pavement construction and overlay operations
- Utility work
- Extension or modifications of drainage channels

Project Feature PF-UES-2 requires the contractor to coordinate all temporary mainline, ramp, and arterial roadway closures and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times, including the identification of alternative routes for emergency vehicles and routes across the construction areas that are developed in coordination with the affected agencies and corridor cities. The roadway improvements associated with the Build Alternative would not generate new students or additional demand for school capacity and would not induce

population growth or additional demand for park capacity. Therefore, project impacts to emergency response or evacuation plans would be less than significant.

Other than a potential for delays to public service response, the Build Alternative would have no impact on physical government facilities.

3.1.16 Recreation

Project impacts:	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 type="checkbox"/>	<input checked="" 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

Determinations are based on Section 2.2, Growth, and Appendix A: Resources Evaluated relative to the Requirements of Section 4(f).

a) and b) No Impact

The Build Alternative would not 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. The Build Alternative would not include recreational facilities or require the construction or expansion of recreational facilities that would have an adverse physical effect on the environment.

3.1.17 Transportation

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CEQA Significance Determinations for Transportation

Determinations are based on the Final Traffic Operations Report and Traffic Analysis Addendum prepared for the SR 55 (I-5 to SR 91) Widening Project Approval/Environmental Document, dated July 2018 (July 2018) and dated August 2, 2019 (August 2019), and in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities.

a) *Less Than Significant Impact*

As discussed in the Section 2.1, Land Use, the Build Alternative would not conflict with adopted policies, plans, or programs supporting alternative transportation modes. The permanent improvements in the Build Alternative would not affect the existing bike facilities at the arterial overcrossings or undercrossings or on the east and west sides of the SR 55 corridor. The arterial improvements would also include features consistent with ADA requirements. As a result, the Build Alternative would not conflict with alternative transportation modes and impacts would be less than significant. 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, and impacts are less than significant.

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.). The potential construction traffic impacts described in Section 2.5.3 would result in typical construction delays within the project areas. Standard project features minimize potential temporary impacts on motorists, pedestrians, bicyclists, and public transit; and impacts are less than significant.

Table 2.5-3, Table 2.5-7, and Table 2.5-11 in Section 2.5, show the levels of service for the Existing, Build Alternative, and the No Build Alternative in the AM and PM peak hours under the existing condition, 2035, and 2055. Based on system-wide traffic metrics for opening year (Table 2.510) and design year (Table 2.5-14), increasing congestion along the SR 55 corridor in 2035 and 2055 would result in high vehicle delay under the No Build Alternative in both the AM and PM peak periods.

Opening Year (2035) corridor travel times during the AM peak hour, the northbound vehicles would travel at approximately 60 mph between I-5 and SR 22 and then expect moderate slowdown to 51 mph between SR 22 and SR 91. In the southbound direction, substantial congestion along southbound SR 55 under the No Build Alternative would result in an average speed of 30 mph between SR 91 and SR 22 and less than 30 mph between SR 22 and I-5. During the PM peak hour, significant congestion along the northbound SR 55 would result in an average speed of 26 mph through the study corridor, while the southbound SR 55 traffic would flow much better, with a speed of 60 mph from SR 91 to SR 22 and approximately 55 mph from SR 22 to I-5.

Horizon year (2055) corridor travel time during the AM peak hour, the northbound vehicles would travel at approximately 50 mph between I-5 and SR 22 and then expect moderate slowdown to 30 mph between SR 22 and SR 91. In the southbound direction, substantial

congestion along southbound SR 55 under the No Build Alternative would result in an average speed of 27 mph between SR 91 and SR 22 and 24 mph between SR 22 and I-5. During the PM peak hour, significant congestion along the northbound SR 55 would result in an average speed of approximately 25 mph through the study corridor, while the southbound SR 55 traffic would flow much better with a speed of 57 mph from SR 91 to SR 22 and 51 mph from SR 22 to I-5.

b) Less Than Significant Impact

According to the 2017 Orange County Congestion Management Program (CMP) prepared by OCTA, four study intersections are included in the CMP Highway System: SR-55 NB Ramps/Irvine Boulevard, SR-55 SB Ramps/Irvine Boulevard, SR-55 NB Ramps/Katella Avenue, and SR-55 SB Ramps/Katella Avenue. The level of service (LOS) standard for CMP intersections is LOS E. The performances of the four CMP intersections as forecasted in the traffic report for 2035 and 2055 are described below:

Opening Year 2035

Under the Build Alternative, the SR-55 NB Ramps/Irvine Boulevard intersection would operate at LOS C and D during the AM and PM peak hours; SR-55 SB Ramps/Irvine Boulevard intersection would operate at LOS C during both peak hours; SR-55 NB Ramps/Katella Avenue intersection would operate at LOS C and D during the AM and PM peak hours; and SR-55 SB Ramps/Katella Avenue intersection would also operate at LOS C and D during the AM and PM peak hours.

Design Year 2055

Under the Build Alternative, the SR-55 NB Ramps/Irvine Boulevard intersection would operate at LOS C during both the AM and PM peak hours; SR-55 SB Ramps/Irvine Boulevard intersection would also operate at LOS C during both peak hours; SR-55 NB Ramps/Katella Avenue intersection would operate at LOS B and D during the AM and PM peak hours; and SR-55 SB Ramps/Katella Avenue intersection would also operate at LOS C and B during the AM and PM peak hours.

In addition, a total of 10 study intersections are projected to operate at LOS E or F during one or both peak hours under the Build Alternative during the Opening Year 2035. However, none of the 10 intersections would expect degradation from the No Build Alternative, and majority of these intersections would expect reduced delay when compared to the No Build Alternative. All other intersections would operate at acceptable LOS D or better conditions during both peak hours.

During the Design Year 2055, a total of 12 study intersections are projected to operate at LOS E or F during one or both peak hours under the Build Alternative. However, none of these intersections would expect degradation from the No Build Alternative, and majority of

them would expect reduced delay when compared to the No Build Alternative. All other intersections would operate at acceptable LOS D or better conditions during both peak hours.

Since the Build Alternative would not exceed the LOS E standard identified in the CMP, it would not conflict with the Orange County CMP. No mitigation is required.

c) No Impact

The Build Alternative would include an additional lane in each direction and associated ramp improvements for an existing freeway and would not require any reconfiguration to the existing corridor or increase hazards due to a geometric design feature or incompatible use. The Build Alternative would be designed, constructed, and operated consistent with the Caltrans Highway Design Manual (2016d) and other applicable standards and specifications for freeways, ramps, arterial intersections, retaining walls, noise barriers, drainage features, and utility relocations/modifications; and impacts would be less than significant.

d) Less Than Significant Impact

Construction of the Build Alternative would result in temporary impacts to traffic circulation, including emergency services. Those impacts are addressed with standard Caltrans Project Features that are included in the project. Project Feature PF-T-1 and PF-UES-2 address requirements for coordination with emergency service providers and accommodation of emergency travel routes and access to, through, and around active construction areas. During project operation, the Build Alternative would reduce traffic congestion and travel times on SR 55. The improvements in the Build Alternative are likely to reduce delay, and impacts are less than significant.

3.1.18 Tribal Cultural Resources

<p>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:</p>	<p>Significant and Unavoidable Impact</p>	<p>Less Than Significant with Mitigation Incorporated</p>	<p>Less Than Significant Impact</p>	<p>No Impact</p>
<p>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</p>	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><input checked="" type="checkbox"/></p>	<p><input type="checkbox"/></p>
<p>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.</p>	<p><input type="checkbox"/></p>	<p><input type="checkbox"/></p>	<p><input checked="" type="checkbox"/></p>	<p><input type="checkbox"/></p>

CEQA Significance Determinations for Tribal Cultural Resources

The potential for the Build Alternative to adversely impact Tribal Cultural Resources was assessed in the HPSR (March 2019); 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 project 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 initiated by Caltrans on March 14, 2018. Letters requesting information about cultural resources in the project area were sent via certified first-class mail to all of the tribal contacts identified by the NAHC on March 14, 2018. The tribal contacts included:

- Ralph Goff, Chairperson, Campo Band of Mission Indians
- Michael Garcia, Vice Chairperson, Ewiiapaayp Tribal Office
- Robert Pinto, Chairperson, Ewiiapaayp Tribal Office
- Andrew Salas, Chairperson, Gabrieleno Band of Mission Indians – Kizh Nation
- Anthony Morales, Chairperson, Gabrieleno/Tongva San Gabriel Band of Mission Indians
- Sandonne Goad, Chairperson, Gabrielino/Tongva Nation
- Robert Dorame, Chairperson, Gabrielino Tongva Indians of California Tribal Council
- Charles Alvarez, Chairperson, Gabrielino-Tongva Tribe
- Erica Pinto, Chairperson, Jamul Indian Village
- Sonia Johnston, Chairperson, Juaneño Band of Mission Indians
- Matias Belardes, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation Belardes
- Teresa Romero, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation Romero
- Gwendolyn Parada, Chairperson, La Posta Band of Mission Indians
- Javaughn Miller, Tribal Administrator, La Posta Band of Mission Indians
- Angela Elliott Santos, Chairperson, Manzanita Band of Kumeyaay Nation
- John Valenzuela, Chairperson, San Fernando Band of Mission Indians
- Allen F. Lawson, Chairperson, San Pasqual Band of Mission Indians
- Cody J. Martinez, Chairperson, Sycuan Band of Kumeyaay Nation
- Robert Welch, Chairperson, Viejas Band of Kumeyaay Indians

Each letter notified the tribe of the proposed project, described the project components, and summarized the investigations being conducted to identify cultural resources within the project APE, including the results of the NAHC SLF search, record search, and previous cultural resources studies conducted within the APE. Maps of the project location and APE were included. Each letter invited the tribe to participate in consultation for the proposed project. Follow-up phone calls were made to each tribal contact upon confirmation of receipt of the letter. No response was received from 17 of the 19 contacted tribes. Responses were received from two of the tribes: the Viejas Band of Kumeyaay Indians and the Gabrieleno Band of Mission Indians – Kizh Nation. A follow-up email was sent to the tribes. Further details 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

No eligible resources were identified within the APE. Tribal consultation did not identify any eligible resources. Project Features PF-CUL-1 and PF-CUL-2 require that if human remains or buried archeological resources are unearthed, work will be stopped and all earthmoving activity within and around the immediate discovery will be diverted away from the area until a qualified archaeologist can assess the nature and significance of the find and/ or the coroner can assess and remove any human remains.

3.1.19 Utilities and Service Systems

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) 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 type="checkbox"/>	<input checked="" type="checkbox"/>
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) 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

Determination are based on Section 2.4, Utilities and Service Systems, and responses to Hydrology and Water Quality above.

a), b) and c) No Impact

The Build Alternative would not require water treatment during construction or operation that would require or result in the construction of new water treatment facilities or infrastructure. 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 or require or result in the construction of new wastewater treatment facilities. The Build Alternative would not require additional electric power or natural gas during construction or operation that would require or result in the construction of new electric or natural gas infrastructure. The Build Alternative would also not require telecommunications facilities during construction or operation.

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 project operations 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 SR 55 and would be approximately the same as the existing demand. 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, and impacts are less than significant.

d) Less Than Significant Impact

Types of waste materials generated during construction are anticipated to include: vegetation, other plant material, and some excess soils and solid waste such as concrete, asphalt, and wood. Construction waste would be recycled in accordance with Caltrans guidelines or would be properly disposed of at an existing landfill. 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. The project waste volume would be minimal compared to daily total volumes processed at area recycling facilities and landfills. 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; and impacts would be less than significant.

e) Less Than Significant Impact

Any solid waste generated during construction of the Build Alternative would be collected, handled, transported, and disposed of consistent with applicable federal, State, regional, and local regulations. Any hazardous wastes would be collected, handled, transported, and disposed of consistent with applicable federal, State, regional, and local regulations and would not be comingled with general construction wastes. Impacts would be less than significant.

3.1.20 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CEQA Significance Determinations for Wildfire

The proposed project is not located in or near a state responsibility area or land classified as very high fire hazard severity zone. According to the California Department of Forestry and Fire Protection’s (Cal Fire’s) Orange County Fire Hazard Severity Zone Map, the proposed project is approximately 4.5 miles away from a designated very high fire hazard severity zone in the state responsibility area, within Irvine Regional Park (Cal Fire 2007). The proposed project is approximately 0.65 mile away from a recommended very high fire hazard severity zone in the local responsibility area, within the City of Orange (Cal Fire 2011). The proposed project would implement improvements within an existing alignment, and the area between SR 55 and the fire hazard severity zone is urban and densely developed. There would be no exposure to a significant risk of loss, injury, or death associated with wildland fires or post-fire flooding/landslides for people or structures. Wildfire is also discussed below in Section 3.3.

3.1.21 Mandatory Findings of Significance

Project impacts:	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 checked="" type="checkbox"/>	<input 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 with Mitigation Incorporated*

The potential for the Build Alternative to result in significant impacts to biological or paleontological resources is discussed in Sections 2.7 and 2.15 through 2.20. 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 bats and nesting birds protected under the Migratory Bird Treaty Act and the California Fish and Game Code will be avoided, minimized, and/or mitigated to a level below significance after implementation of BIO-1 and BIO-2. 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 (March 2019), it was determined that no archeological resources are within the APE. Two properties were identified within the APE that appear to be eligible for inclusion in the NRHP and would qualify as historical resources pursuant to CEQA. One other property that was evaluated was not eligible for the NRHP but is considered a historical resource for the purposes of CEQA (Table 3.1-1). Caltrans, pursuant to Section 106 PA Stipulation IX.A and, as applicable, PRC 5024 Memorandum of Understanding Stipulation IX.A.2 (Caltrans 2015a), has determined a Finding of No Historic Properties Affected is appropriate for this undertaking as the Build Alternative would not result in a take or easement of these properties. Additionally, the properties have been adjacent to an existing freeway that was constructed more than 50 years ago. Therefore, the project would not result in a direct or indirect impact to historic properties or 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-CUL-1, provided in Section 2.7, would avoid and/or minimize potential impacts to previously unknown cultural resources. To avoid impacts to potential paleontological resources that may be present where excavation may occur in areas of undisturbed soils, a PMP, detailed in Mitigation Measures PALEO-1 and PALEO-2 provided in Section 2.11, 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 would be avoided and/or minimized with implementation of Project Features PF-CUL-1 and PF-CUL-2, provided in Section 2.7.

b) *Less Than Significant Impact*

As discussed in Section 2.22, 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 SR 55 within the project limits compared to the No Build Alternative and would not contribute to cumulative considerable 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, 2.7, 2.8, 2.9, 2.10, 2.12, 2.13, and 2.14, the Build Alternative would not result in environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. The Build Alternative would reduce traffic congestion and travel times on SR 55 between I-5 and SR 91. The reduce travel times and decreased congestion would be considered as a beneficial impact on 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 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), and various hydrofluorocarbons (HFCs). CO₂ is the most abundant GHG; while it is a naturally occurring component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO₂.

Two terms are typically used when discussing how the impacts of climate change are addressed: "greenhouse gas mitigation" and "adaptation." Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or "mitigate" the impacts of climate change. Adaptation, on the other hand, is concerned with 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). This analysis will include a discussion of both.

3.2.1 Regulatory Setting

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

3.2.1.1 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.

NEPA (42 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 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.¹ This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of sustainability.”² 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.

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 most important of these was the Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Economy (CAFE) 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 CAFE program based on each manufacturer’s average fuel economy for the portion of its vehicles produced for sale in the United States.

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 U.S. EPA³ in conjunction with the National Highway Traffic Safety Administration (NHTSA) is responsible for setting GHG emission standards for new cars and light-duty vehicles to significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. The current standards require vehicles to meet an average fuel economy of 34.1 mpg by 2016. U.S. EPA and NHTSA are currently considering appropriate mileage and GHG emissions standards for 2022–2025 light-duty vehicles for future rulemaking.

¹ <https://www.fhwa.dot.gov/environment/sustainability/resilience/>

² <https://www.sustainablehighways.dot.gov/overview.aspx>

³ U.S. 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, U.S. 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 U.S. EPA’s assessment of the scientific evidence that form the basis for U.S. EPA’s regulatory actions.

NHTSA and U.S. 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 2.0 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, 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.

3.2.1.2 State

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and EOs including, but not limited to, the following:

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

AB 32, Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals 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.

EO 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.

SB 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The 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.

SB 391, Chapter 585, 2009, California Transportation Plan: This bill requires the State’s long-range transportation plan to identify strategies to address California’s climate change goals under AB 32.

EO B-16-12 (March 2012) 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.

EO B-30-15 (April 2015) 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 (MMTCO_{2e}).⁴ Finally, it requires the Natural Resources Agency to update the State's climate adaptation strategy, *Safeguarding California*, every three years and to ensure that its provisions are fully implemented.

SB 32 Chapter 249, 2016, 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.

SB 1386, Chapter 545, 2016, declared “it to be the policy of the state that the protection and management of natural and working lands ... is an important strategy in meeting the state's greenhouse gas reduction goals, and would require all state agencies, departments, boards, and commissions to consider this policy when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria relating to the protection and management of natural and working lands.”

AB 134, Chapter 254, 2017, allocates GHG Reduction Funds and other sources to various clean vehicle programs, demonstration/pilot projects, clean vehicle rebates and projects, and other emissions-reduction programs statewide.

SB 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles traveled, to promote the state's goals of reducing GHG emissions and traffic-related air pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

SB 150, Chapter 150 2017, Regional Transportation Plans: This bill requires ARB to prepare a report that assesses progress made by each metropolitan planning organization in meeting their established regional GHG emission reduction targets.

EO B-55-18, (September 2018) sets a new statewide goal to achieve and maintain carbon neutrality no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

⁴ GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO₂ is the most important GHG, so amounts of other gases are expressed relative to CO₂, using a metric called “carbon dioxide equivalent” (CO_{2e}). The global warming potential of CO₂ is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO₂.

3.2.2 Environmental Setting

SR 55 provides a key linkage between the coastal areas in Newport Beach and other beach communities and cities along the corridor in central Orange County. SR 55 has interchanges with several other freeways, providing access to the countywide and regional freeway systems. The proposed project is in an urban area of Orange County with a well-developed road and street network. The LOSSAN, an important passenger and freight rail corridor that connects metropolitan areas from Los Angeles to San Diego, crosses SR 55 south of I-5, approximately 500 feet north of Edinger Avenue in the City of Santa Ana. Metrolink Inland Empire – Orange County Line also travels within the corridor, crossing SR 91 0.75 mile west of the SR 55/91 interchange. Train operations on this segment of the LOSSAN rail corridor include Amtrak’s Pacific Surfliner intercity passenger rail service, the Southern California Regional Rail Authority Metrolink commuter rail service, and the Union Pacific Railroad and BNSF Railway freight rail services. JWA is located south of the project area near SR 55 and I-405. Twelve OCTA bus routes operate on SR 55 within the project limits and arterials in the vicinity. The project area is mainly residential, with education, open space and recreation, facilities, general offices, and retail and commercial services land uses mixed in. Traffic congestion during peak hours is not uncommon in the project area. SCAG’s RTP/SCS guides transportation and housing development in the project area.

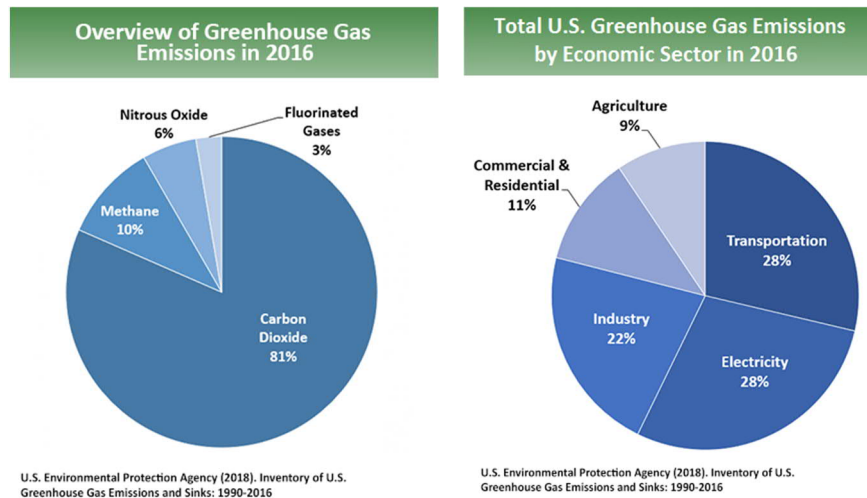
A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period of time, such as a calendar year. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission reduction goals. U.S. EPA is responsible for documenting GHG emissions nationwide, and the ARB does so for the state, as required by Health and Safety Code Section 39607.4.

National GHG Inventory

The U.S. EPA prepares a national GHG inventory every year and submits it to the United Nations in accordance with the Framework Convention on Climate Change. The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO₂, CH₄, N₂O, HFCs, perfluorocarbons, SF₆, and nitrogen trifluoride. It also accounts for emissions of CO₂ that are removed from the atmosphere by “sinks” such as forests, vegetation, and soils that uptake and store CO₂ (carbon sequestration). The 1990–2016 inventory found that of 6,511 MMTCO₂e GHG emissions in 2016, 81% consist of CO₂, 10% are CH₄, and 6% are N₂O; the balance consists of fluorinated gases (EPA, 2018a).⁵ In 2016, GHG emissions from the transportation sector accounted for nearly 28.5% of U.S. GHG emissions.

⁵ U.S. Environmental Protection Agency. 2018. Inventory of U.S. Greenhouse Gas Emissions and Sinks. <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>

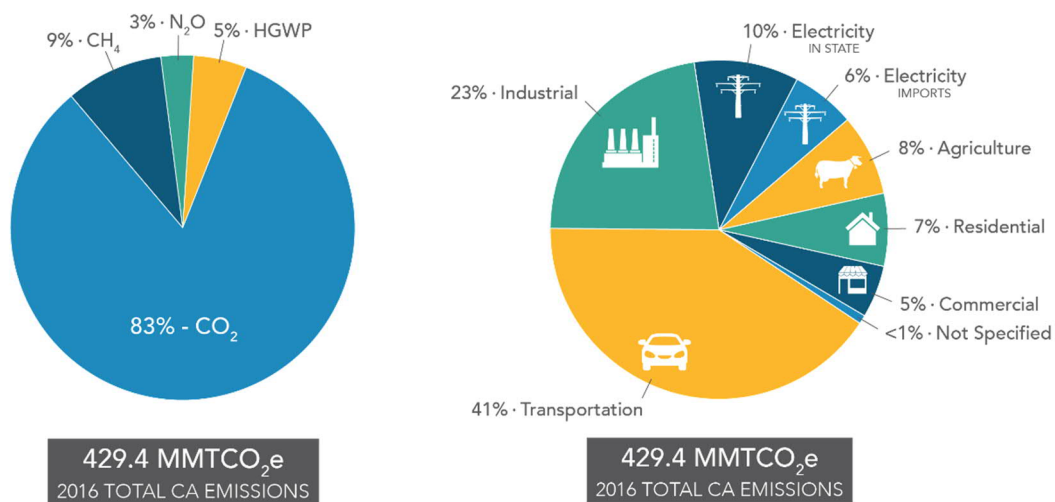
Figure 3.2-1. U.S. 2016 Greenhouse Gas Emissions



State GHG Inventory

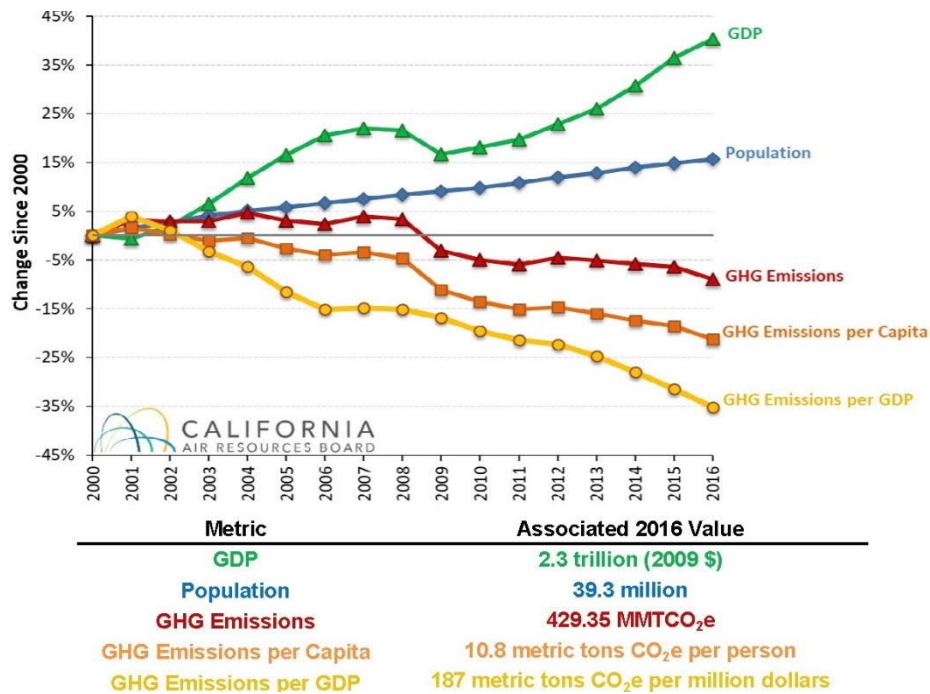
ARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year. It then summarizes and highlights major annual changes and trends to demonstrate the state’s progress in meeting its GHG reduction goals. The 2018 edition of the GHG emissions inventory found total California emissions of 429 MMTCO₂e for 2016, with the transportation sector responsible for 41% of total GHGs. It also found that GHG emissions have declined from 2000 to 2016 despite growth in population and state economic output.⁶

Figure 3.2-2. California 2016 Greenhouse Gas Emissions



⁶ 2018 Edition of the GHG Emission Inventory (July 2018). <https://www.arb.ca.gov/cc/inventory/data/data.htm>

Figure 3.2-3. Change in California GDP, Population, and GHG Emissions Since 2000



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 and to update the scoping plan every 5 years. ARB adopted the first scoping plan in 2008. The second updated plan, California’s 2017 Climate Change Scoping Plan, adopted on December 14, 2017, 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.

Regional Plans

ARB sets regional targets for California’s 18 MPOs to use in their RTP/SCSs to plan future projects that will cumulatively achieve GHG reduction goals. Targets are set at a percent reduction of passenger vehicle GHG emissions per person from 2005 levels. The proposed project is included in the RTP/SCS for SCAG. The regional reduction target for SCAG is 8 percent for 2020 and 19 percent for 2035. The proposed project is within the jurisdiction of the OCTA. Applicable plans and their relevant policies or objectives are summarized in Table 3.2.1.

Table 3.2-1: Summary of Applicable Plans and Underlying Policies and Objectives

Plan Title	GHG Reduction Policies or Strategies
Southern California Association of Governments (SCAG) <i>2016–2040 Regional Transportation Plan/Sustainable Communities Strategy</i> (adopted April 7, 2016)	<ul style="list-style-type: none"> • Congestion Management Process • Integrated multi-modal network • Expand the public transit network • Strategic capacity and technology enhancements to existing highways • Transportation Systems Management and Transportation Demand Management • New Infrastructure • Livable Corridors/Neighborhood Mobility Areas • High Quality Transit Areas and Transit-Oriented Development
<i>OC Go (OCTA Measure M Renewal Ordinance)</i> (Amended March 2016)	<ul style="list-style-type: none"> • Reduce congestion, improve mobility, and enhance safety in freeways • Synchronized traffic lights mean less stop and more go on streets and roads • Provides transit connections to Metrolink • Supports locally developed transit services for seasonal and year-round community circulators • Permanently protected open space properties and restoration projects preserve the land and ensure that valuable animal and plant species can thrive forever for future generations • Context-sensitive (including environment) design, for example, environmentally friendly, local, and native landscaping
<i>OCTA OC Go Next 10 Delivery Plan 2017-2026</i> (Adopted November 2016)	<ul style="list-style-type: none"> • Improvements to SR 55, including the proposed project (SR 55 between I-5 and SR 91), are included in the Next 10 plan
<i>OCTA Designing Tomorrow Long Range Transportation Plan</i> (adopted November 2018)	<ul style="list-style-type: none"> • Improvements to SR 55 to add capacity and improve operations are included in the LRTP. • Support sustainability • Coordination with partner agencies on implementation of sustainability strategies • Deliver a financially constrained long-range transportation plan and identify opportunities to reduce funding uncertainty • Explore environmental and emission reduction strategies • System maintenance
<i>OCTA & Orange County Council of Governments Orange County Sustainable Communities Strategy (SCS)</i> (June 2011)	<ul style="list-style-type: none"> • Increase regional accessibility to reduce vehicle miles traveled • Eliminate bottlenecks and reduce delay on freeways, toll roads, and arterials • Apply Transportation System Management and Complete Street practices to arterials and freeways to maximize efficiency • Implement near-term and long-term transportation improvements to provide mobility choices and sustainable transportation options • Acknowledge current local sustainability strategies that will result in or support the reduction of GHG emissions. • Deliver committed projects including M2 • Expand access for high-occupancy vehicles • Improve freeway systems operations

Plan Title	GHG Reduction Policies or Strategies
City of Orange 2010 General Plan (adopted March 9, 2010)	<ul style="list-style-type: none"> • Natural Resources Element: Air Resources and Climate Change • Circulation and Mobility Element • Infrastructure Element • Transportation Demand Management Ordinance • Transit-oriented design and development • Improve street capacity • Maintain and expand roadway and bikeway systems • Preparing Climate Action Plan • Environmental Impact Report for General Plan identified that vehicles-related GHG emissions would increase 48% between existing and future development capacity of the then proposed general plan
City of Santa Ana Climate Action Plan (adopted December 2015)	<ul style="list-style-type: none"> • Development of Local Retail Service Nodes • Local Residential Nodes near Retail and Employment • Traffic Signal Synchronization Program • End of Trip Facilities in New Projects • Safe Routes to Schools • Design Guidelines for External Bike/Pedestrian/Transit Connectivity • Municipal Operations Measure
City of Santa Ana General Plan (adopted February 1998, re-formatted January 2010)	<ul style="list-style-type: none"> • Reduce transportation-related and construction-related energy consumption • Promote a fully integrated multi-modal circulation system • Preserve, maintain, and properly use natural and cultural resources • Reduce air pollution emissions • Conserve water resources • Increase planting of trees, bushes, shrubs, and flowers on public and private property • Manage growth to reduce traffic congestion and to provide adequate transportation and public facilities • Ensure that the impacts of development are mitigated • Utilize open spaces as means of reinforcing goals set forth for conservation of natural resources
City of Tustin General Plan (adopted November 2018)	<ul style="list-style-type: none"> • Encourage new development facilitating transit services • Monitor “corridor” (urban rail) design study process • Safe Routes to Schools • Encourage ride-sharing • Promote funding and development of transit facilities from new development • Increase non-motorized modes of transportation • Preserve public and private open space lands for active and passive recreational opportunities • Reduce air pollution through proper land use, transportation, and energy use planning • Improve air quality by influencing transportation choices • Protect and conserve water resources, plant and animal communities, overall environs, and energy resources

Plan Title	GHG Reduction Policies or Strategies
County of Orange General Plan (adopted 2005; amended 2015)	<ul style="list-style-type: none"> • Encourage infill and transit-oriented development • Plan an integrated land use and transportation system for transit modes • Maximize energy resources conservations in future land use and transportation planning decisions • Support utilization of energy conservation measures • Support regional transportation programs that reduce energy consumption • Encourage use of alternative energy systems • Acquire local park lands to landscape open space • Manage growth to reduce traffic congestion; provide adequate transportation and public facilities; and protect natural environment

3.2.3 Project Analysis

GHG emissions for transportation projects can be divided into those produced during operation of the SHS and those produced during construction. The primary GHGs produced by the transportation sector are CO₂, CH₄, N₂O, and HFCs. CO₂ emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH₄ and N₂O are emitted during fuel combustion. In addition, a small amount of HFC emissions are included in the transportation sector.

The CEQA Guidelines generally address GHG emissions as a cumulative impact because of the global nature of climate change (Pub. Resources Code, § 21083(b)(2)). As the California Supreme Court explained, “because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself” (Cleveland National Forest Foundation v. San Diego Assn. of Governments [2017] 3 Cal.5th 497, 512.). In assessing cumulative impacts, it must be determined if a project’s incremental effect is “cumulatively considerable” (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. Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment.

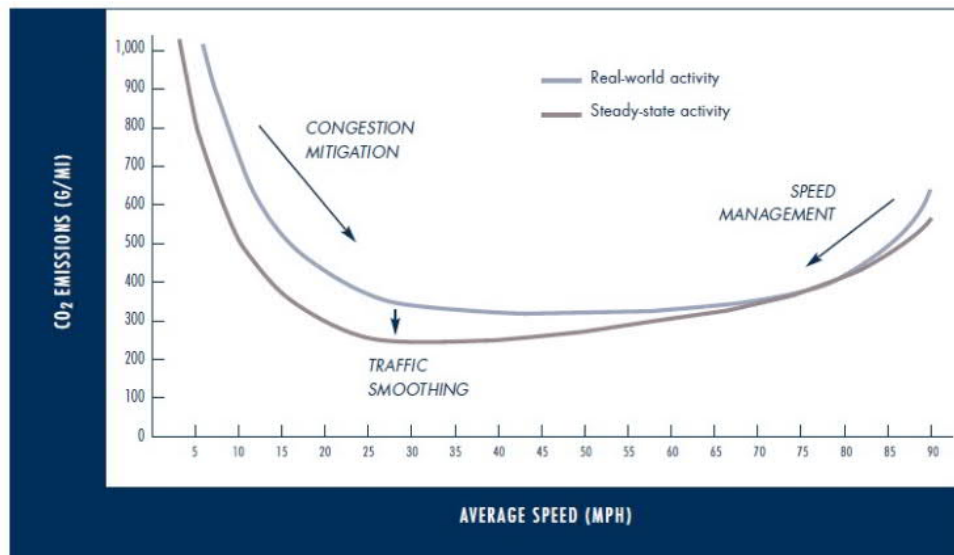
3.2.3.1 Operational Emissions

CO₂ accounts for 95 percent of transportation GHG emissions in the U.S. The largest sources of transportation-related GHG emissions are passenger cars and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. These sources account for over half of the emissions from the sector. The remainder of GHG emissions comes from other modes of transportation, including freight trucks, commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants. Because CO₂ emissions represent the greatest percentage of GHG emissions, it has been selected as a proxy within the following analysis for potential climate change impacts generally expected to occur.

The highest levels of CO₂ from mobile sources such as automobiles occur at stop-and-go speeds (0 – 25 mph) and speeds over 55 mph; the most severe emissions occur from 0 – 25 mph (Figure 3.2-4). 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 3.2-4. Possible Use of Traffic Operation Strategies in Reducing On-Road CO₂ Emissions



Source: Barth and Boriboonsomsin 2010⁷

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.

SCAG's 2016-2040 RTP/SCS charts a course for closely integrating land use and transportation in certain areas of the region so that the region as a whole can grow smartly and sustainably. The 2016-2040 RTP/SCS includes more than 4,000 projects—ranging from highway improvements, railroad grade separations, and bicycle lanes to new transit hubs and replacement bridges. The regional transit planning behind the creation of the 2016-2040 RTP/SCS accounts for a continued statewide emphasis on reducing GHG emissions and consistency with SB 375. The 2016-2040 RTP/SCS regional air quality modeling demonstrates that the implementation of projects included in the RTP/SCS would create a transportation network that would be consistent with SB 375 GHG reduction goals. The project is listed in the 2016-2040 RTP/SCS and is consistent with regional GHG reduction goals.

OCTA bus routes 213 and 794 include a portion of SR 55. There are no plans at this time to add or modify transit facilities within the project limits as a component of the project; however, improvements to the mainline capacity would provide transit benefits by potentially reducing the travel time of any transit route that is programmed or would use this portion of the SR 55 mainline in the future. No rail transit connections or rail transit lanes run parallel to the segment

⁷ Barth, Matthew and Kanok Boriboonsomsin. 2010. *Real-World Carbon Dioxide Impacts of Traffic Congestion*. Berkeley, CA: University of California Transportation Center. UCTC-FR-2010-11. Available: <https://www.researchgate.net/publication/46438207>

of SR 55 in the project corridor. Additionally, AB 2542 requires any state or local automobile capacity-increasing project or highway realignment project approved by the California Transportation Commission (CTC) to have considered reversible lanes. An evaluation of reversible lanes was completed, and it was noted that SR 55 from I-5 to SR 91 does not currently exhibit a significant directional imbalance of peak-hour traffic volumes and is not anticipated to do so in the future. Additionally, if reversing a traffic lane were to be implemented, the remaining lanes would not be able to accommodate existing or future traffic volumes because severe traffic congestion presently exists in both directions. Accordingly, reversible traffic lanes are not feasible for the SR 55 Improvement Project. In addition, SCAG has made the Congestion Management Process an integral part of the regional transportation process. A detailed plan that assesses single-occupancy vehicle capacity-enhancing projects is included in an appendix to the 2016–2040 RTP/SCS. The SR 55 corridor within the project limits is currently experiencing congestion and traffic delays during the peak hours due to local, regional, and interregional traffic demand exceeding capacity. In addition, forecasted local and regional traffic demand is expected to increase, resulting in the need to improve the SR 55 corridor. Consistent with the Congestion Management Process, the project is designed to improve traffic operations on SR 55 in Orange County to reduce congestion, increase throughput, and enhance trip reliability for the planning design year of 2055. Table 3.2-2 presents AM and PM peak-hour VHD on SR 55 within the study area, as well as the daily VMT, under existing conditions and in 2035 and 2055 with and without implementation of the project:

Table 3.2-2: AM and PM Peak-Hour Vehicle Hours of Delay

Alternative	AM Peak Hour VHD	PM Peak Hour VHD	Daily VMT
Existing/Baseline	8,330	8,520	2,064,511
No Build 2035	9,930	13,110	2,207,707
Build 2035	8,040	12,290	2,204,400
No Build 2055	15,880	16,630	2,408,949
Build 2055	13,730	15,900	2,425,647

Notes: VHD: vehicle hours of delay; VMT: vehicle miles traveled.
Source: Orange County Transportation Analysis Model, Version 4.0

As shown in Table 3.2-1, peak-hour VHD would be reduced in 2035 and 2055 with implementation of the Build Alternative relative to the No Build Alternative. This decrease is attributed to expanded capacity and improved traffic flow. The expansion of capacity results in an increase in daily VMT between the Build Alternative and the No Build Alternative in 2055 as the project corridor would accommodate more vehicles. GHG emissions are correlated with VMT and vehicle speeds, such that GHG emissions increase when VMT increases and when congestion increases. In 2035, there is a slight decrease in daily VMT under the Build Alternative relative to the No Build Alternative associated with removal of one of the off-ramps, which would reduce the length of roadways being traversed within the study area.

3.2.3.2 Quantitative Analysis

The ARB developed the **emission factors** (EMFAC) model to facilitate preparation of statewide and regional mobile source emissions inventories. The model generates emissions rates that can be multiplied by vehicle activity data from all motor vehicles, including passenger cars and heavy-duty trucks, operating on highways, freeways, and local roads in California. Caltrans'

CT-EMFAC model uses data derived from EMFAC to streamline project-level emissions analyses. The CT-EMFAC model is recommended by Caltrans for quantifying mobile source emissions from transportation projects on the California State Highway System. The EMFAC2014/CT-EMFAC2014 model has been approved by U.S. EPA and meets the FHWA's transportation planning requirements.

Regional operational emissions associated with project implementation were calculated using CT-EMFAC2014. EMFAC2014 is the most recent on-road emissions modeling tool in California that has been approved for use by the U.S. EPA. EMFAC2014 contains a comprehensive emissions inventory of motor vehicles that provides estimated emission rates for air pollutants. The emission rates provided by EMFAC2014 in grams per mile were used in conjunction with traffic data.

Table 3.2-3 shows mobile source CO_{2e} emissions (comprising CO₂ and CH₄) in the existing condition and 2035 and 2055 for the No Build and Build Alternatives. Emissions decrease in 2035 and 2055 compared to the existing condition primarily due to fleet turnover and improvements in exhaust controls and fuel efficiency. When compared to the No Build Alternative, the Build Alternative would result in slight reductions in annual GHG emissions in 2035 and marginal increases in annual GHG emissions in 2055.

Table 3.2-3: Modeled Annual CO_{2e} Emissions and Vehicle Miles Traveled, by Alternative

Alternative	CO _{2e} Emissions (Metric Tons/Year)	Annual Vehicle Miles Traveled ¹
Existing/Baseline 2017	274,792	716,385,439
Open to Traffic 2035 No Build	186,201	766,074,394
Open to Traffic 2035 Build	184,392	764,926,731
20-Year Horizon/Design-Year 2055 No Build	192,424	835,905,372
20-Year Horizon/Design-Year 2055 Build	193,354	841,700,065

Notes: CO_{2e}: carbon dioxide (CO₂) and methane (CH₄) emissions
Source: EMFAC 2014

¹ Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per California Air Resources Board methodology.

The analysis for 2055 demonstrates that a slight increase in GHG emissions would occur when comparing the Build and No Build Alternatives. The emissions are calculated using emission rates from the EMFAC model along with regional VMT and speed data from the traffic analysis. There would be slight increase in regional VMT, which leads to a slight increase in GHG emissions. Importantly, the traffic analysis also includes VHD. As shown in Table 3.2-2, systemwide VHD would decrease in the AM and PM peak hours in both 2035 and 2055 despite the VMT increase in 2055 and localized congestion at bottlenecks and some segments. The VHD metric demonstrates that the Build Alternative includes systemwide improvements that contribute to GHG reductions.

3.2.3.3 Limitations and Uncertainties with Modeling

While CT-EMFAC has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its GHG emission rates are based on tailpipe emission test data. Moreover, the model does not account for factors such as the rate of acceleration and vehicle aerodynamics,

which influence the amount of emissions generated by a vehicle. GHG emissions quantified using CT-EMFAC are therefore estimates and may not reflect actual physical emissions. Though CT-EMFAC is currently the best available tool for calculating GHG emissions from mobile sources, it is important to note that the GHG results are only useful for a comparison among alternatives.

3.2.3.4 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.

Construction of the project is planned to commence in 2023 and is anticipated to be completed in 2026. The duration of construction is approximately 36 months (3 years). Construction would occur in four phases due to the scale of the project and the need to minimize traffic impacts and maintain traffic during construction. The four phases are Grubbing/Land Clearing, Grading/Excavation, Drainage/Utilities, and Paving. GHG emissions that would be generated during the 3-year construction period were quantified using the Sacramento Metropolitan Air Quality Management District Road Construction Emissions Model (Version 8.1.0). Table 3.2-4 presents the annual average GHG emissions, as well as total GHG emissions that would be generated by construction of the project. In accordance with SCAQMD guidance, the total emissions are amortized over a 30-year period to represent annual emissions.

Table 3.2-4: Modeled CO₂e Emissions – Construction

Alternative	GHG Emissions Metric Tons per Year (MTCO ₂ e/year)	GHG Emissions Total Metric Tons (MTCO ₂ e)	GHG Emissions Amortized Annual Metric Tons (MTCO ₂ e/year)	Construction Duration
Build Alternative	1,542	4,627	154	36 months

Notes: CO₂e includes emissions of carbon dioxide (CO₂), methane (CH₄), and nitrogen oxide (N₂O).
Source: SMAQMD Roadway Construction Emissions Model, version 8.1.0.

All construction contracts include Caltrans Standard Specifications Section 7-1.02A and 7-1.02C, Emissions Reduction, which require contractors to comply with all laws applicable to the project and to certify they are aware of and will comply with all ARB emission reduction regulations; and Section 14-9.02, Air Pollution Control, which requires contractors to comply with all air pollution control rules, regulations, ordinances, and statutes. Certain common regulations, such as equipment idling restrictions, that reduce construction vehicle emissions also help reduce GHG emissions.

3.2.4 CEQA Conclusion

As discussed above, operational GHG emissions in both 2035 and 2055 would decrease compared to existing conditions. In the 2055 design year, the Build Alternative would result in

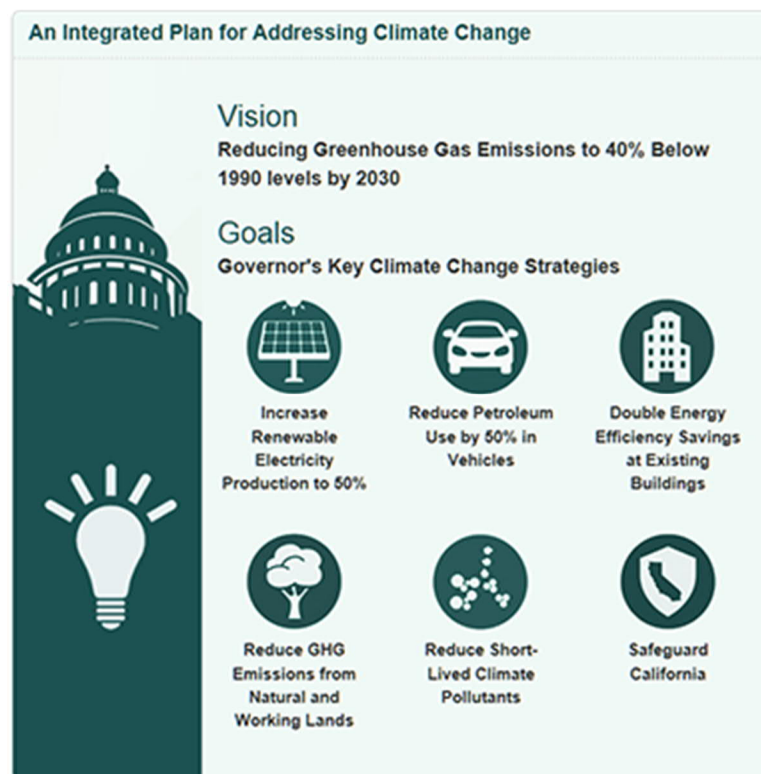
more GHG emissions than the No Build Alternative, although the increase would be less than 1% in annual emissions. Because there is a reduction in future emissions with the project compared to existing emissions, there is evidence that substantial progress in reducing emissions and the impact is considered less than significant.

3.2.4.1 Greenhouse Gas Reduction Strategies

Statewide Efforts

Major sectors of the California economy, including transportation, will need to reduce emissions to meet the 2030 and 2050 GHG emissions targets. Former Governor Edmund G. Brown promoted GHG reduction goals that involved (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from 33 to 50 percent 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*.

Figure 3.2-5. California Climate Strategy



The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that the state build on past successes in reducing criteria and toxic air pollutants from transportation and goods movement. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of VMT. A key state goal for reducing GHGs is to reduce today's petroleum use in cars and trucks by up to 50% by 2030.

In addition, SB 1386 (Wolk 2016) established as state policy the protection and management of natural and working lands and requires state agencies to consider that policy in their own decision making. Trees and vegetation on forests, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the 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 the state's future mobility needs and reduce GHG emissions. In 2016, Caltrans completed the *California Transportation Plan 2040*, which establishes a new model for developing ground transportation systems, consistent with CO₂ reduction goals. It serves as an umbrella document for all the other statewide transportation planning documents. Over the next 25 years, California will be working to improve transit and reduce long-run repair and maintenance costs of roadways and developing a comprehensive assessment of climate-related transportation demand management and new technologies rather than continuing to expand capacity on existing roadways.

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 (Caltrans 2015b). 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 sustainable transportation planning grants. These grants encourage local and regional multimodal transportation, housing, and land use planning that furthers the region's RTP/SCS; contribute to the state's GHG reduction targets and advance transportation-related

GHG emission reduction project types/strategies; and support other climate adaptation goals (e.g., Safeguarding California).

Caltrans Policy Directives and Other Initiatives

Caltrans Director's Policy 30 Climate Change (June 22, 2012) is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities. *Caltrans Activities to Address Climate Change* (April 2013) provides a comprehensive overview of Caltrans' statewide activities to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies

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

- PF-GHG-1:** Landscaping reduces surface warming and, through photosynthesis, decreases carbon dioxide (CO₂). The final design plans will provide landscaping where necessary within the corridor to provide aesthetic treatment, replacement planting, or mitigation planting for the project. The landscape planting would help offset project CO₂ emissions.
- PF-GHG-2:** The final design plans will incorporate the use of energy-efficient lighting, such as light-emitting diode (LED) traffic signals. LED bulbs consume 10 percent of the electricity of traditional lights, which will also help reduce the project's CO₂ emissions.
- PF-GHG-3:** During construction, the Construction Contractor will comply with Caltrans Standard Specification Provisions that restrict idling time for lane closure during construction to 10 minutes in each direction. In addition, the Construction Contractor must comply with Title 13, California Code of Regulations Section 2449(d)(3), which was adopted by the California Air Resources Board on June 15, 2008. That regulation restricts idling of construction vehicles to no longer than five consecutive minutes. Compliance with this regulation reduces harmful emissions from diesel-powered construction vehicles.
- PF-GHG-4:** The project will incorporate Best Available Control Technologies (BACT) as approved by Caltrans for projects during final design/construction (2030- 2032) as applicable:
- Use cement blended with the maximum feasible amount of flash or other materials (i.e., limestone) that reduce GHG emission from cement production.
 - Use lighter-colored pavement where feasible to increase albedo.
 - Use recycled water or grey water for fugitive dust control.
 - Employ energy- and fuel-efficient vehicles and equipment, zero- and/or near-zero emission technologies where available.
 - Encourage ride-sharing and carpooling for construction crews.

- Use asphalt alternatives (i.e., rubberized hot-mix asphalt) to pave roadways.
- Reduce construction waste and maximize the use of recycled materials (reduces consumption of raw materials, reduces landfill waste, and encourages cost savings).
- Incorporate measures to reduce consumption of potable water.
- Encourage improved fuel efficiency from construction equipment (examples provided below):
 - Maintain equipment in proper tune and working condition
 - Use the right size equipment for the job
 - Use equipment with new technologies. Already included in GHG 4.
- Construction Environmental Training: Supplement existing training with information regarding methods to reduce GHG emissions related to construction.
- Encourage the use of alternative bridge construction (ABC) (reduce construction windows, use of more precast elements that in turn reduce need for additional falsework, forms, bracing, etc.).
- Maximize use of recycled materials (e.g., tire rubber).
- Salvage large removed trees for lumber or similar on-site beneficial uses other than standard wood-chipping. (e.g., use in roadside landscape projects or green infrastructure components).
- On-site recycling of existing project features is encouraged: (e.g., metal beam guard railing, light standards, sub-base granular material, or native material that meets Caltrans' specifications for incorporation into new work).
- Lower the rolling resistance of highway surfaces as much as possible while still maintaining design and safety standards.
- Earthwork Balance: Reduce the need for transport of earthen materials by balancing cut and fill quantities.
- Cold in-place recycling: This pavement rehabilitation treatment is used on low traffic-volume, hot mix asphalt (HMA) pavements to extend the pavement service life and to recycle natural resources. The treatment also reduces emissions and energy use associated with processing and hauling these materials (<https://www.dot.ny.gov/programs/climate-change/activities>).

Adaptation

Reducing GHG emissions is only one part of an approach to addressing climate change. Caltrans must plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn

facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

Federal Efforts

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The U.S. Global Change Research Program delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 (15 U.S.C. Chapter 56A Section 2921 et seq). The *Fourth National Climate Assessment*, published in 2018, presents the foundational science and the “human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts, consideration of risk reduction, and implications under different mitigation pathways.” Chapter 12, “Transportation,” presents a key discussion of vulnerability assessments. It notes that “asset owners and operators have increasingly conducted more focused studies of particular assets that consider multiple climate hazards and scenarios in the context of asset-specific information, such as design lifetime.”

U.S. DOT Policy Statement on Climate Adaptation in June 2011 committed the federal Department of Transportation 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.”⁸

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

FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels (FHWA 2019).

State Efforts

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. [*California’s Fourth Climate Change Assessment*](#) (2018) is the state’s latest effort to “translate the state of climate science into

⁸ https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm

useful information for action” in a variety of sectors at both statewide and local scales. It adopts the following key terms used widely in climate change analysis and policy documents:

- *Adaptation* to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
- *Adaptive capacity* is the “combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities.”
- *Exposure* is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.
- *Resilience* is the “capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience.” Adaptation actions contribute to increasing resilience, which is a desired outcome or state of being.
- *Sensitivity* is the level to which a species, natural system, community, government, or other would be affected by changing climate conditions.
- *Vulnerability* is the “susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.” Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income inequality. Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

Several key state policies have guided climate change adaptation efforts to date. Recent state publications produced in response to these policies draw on these definitions.

EO S-13-08, issued by then-governor Arnold Schwarzenegger in November 2008, focused on sea-level rise and resulted in the *California Climate Adaptation Strategy* (2009), updated in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan). The Safeguarding California Plan offers policy principles and recommendations and continues to be revised and augmented with sector-specific adaptation strategies, ongoing actions, and next steps for agencies.

EO S-13-08 also led to the publication of a series of sea-level rise assessment reports and associated guidance and policies. These reports formed the foundation of an interim *State of California Sea-Level Rise Interim Guidance Document* in 2010, with instructions for how state agencies could incorporate “sea-level rise projections into planning and decision making for projects in California” in a consistent way across agencies.

The guidance was revised and augmented in 2013. *Rising Seas in California – An Update on Sea-Level Rise Science* was published in 2017 and its updated projections of sea-level rise and

new understanding of processes and potential impacts in California were incorporated into the *State of California Sea-Level Rise Guidance Update* in 2018.⁹

EO B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This EO recognizes that effects of climate change other than sea-level rise also threaten California's infrastructure. At the direction of EO B-30-15, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies* in 2017 to encourage a uniform and systematic approach. Representatives of Caltrans participated in the multi-agency, multidisciplinary technical advisory group that developed this guidance on how to integrate climate change into planning and investment.

AB 2800 (Quirk 2016) created the multidisciplinary Climate-Safe Infrastructure Working Group, which in 2018 released its report, *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California*. The report provides guidance to agencies on how to address the challenges of assessing risk in the face of inherent uncertainties still posed by the best available science on climate change. It also examines how state agencies can use infrastructure planning, design, and implementation processes to address the observed and anticipated climate change impacts.

Caltrans Adaptation Efforts

Caltrans Vulnerability Assessments

Caltrans is conducting climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects including precipitation, temperature, wildfire, storm surge, and sea-level rise. The approach to the vulnerability assessments was tailored to the practices of a transportation agency, and involves the following concepts and actions:

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

The climate change data in the assessments were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the vulnerability assessments will guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and to provide and maintain transportation that meets the needs of all Californians.

⁹ <http://www.opc.ca.gov/updates/californias-sea-level-rise-guidance/>

3.2.4.2 Project Adaptation Analysis

Sea Level Rise Analysis

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.

Floodplains

Portions of the project limits traverse the Lower Santa Ana River Watershed, the Santiago Creek Watershed, and the San Diego Creek Watershed. Santiago Creek, an intermittent stream, is the only natural watercourse in the project study area, crossing SR 55 at PM 13.42 at the Santiago Creek Bridge. The project crossing is in a 100-year floodplain and FEMA Zones AE at this location (see Section 2.8). The project hydrology and floodplain analysis (Section 2.8) indicates the project would not change flood storage capacity or modify flood flows, and therefore would not increase the risk of flooding. The *Caltrans Climate Change Vulnerability Assessments District 12 Draft Technical Report* (December 2018) shows that SR 55 is in an area projected to experience a less than 5 percent increase in 100-year storm precipitation depth through 2085. During the design phase, detailed pavement hydrology and hydraulic analysis will be conducted to calculate flows and size drainage facilities in conformance with Caltrans design criteria.

Wildfire

The project segment is fully developed and not within or near a designated very high fire hazard severity zone. Therefore, the project would not exacerbate the effects of climate change related to wildfire.

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